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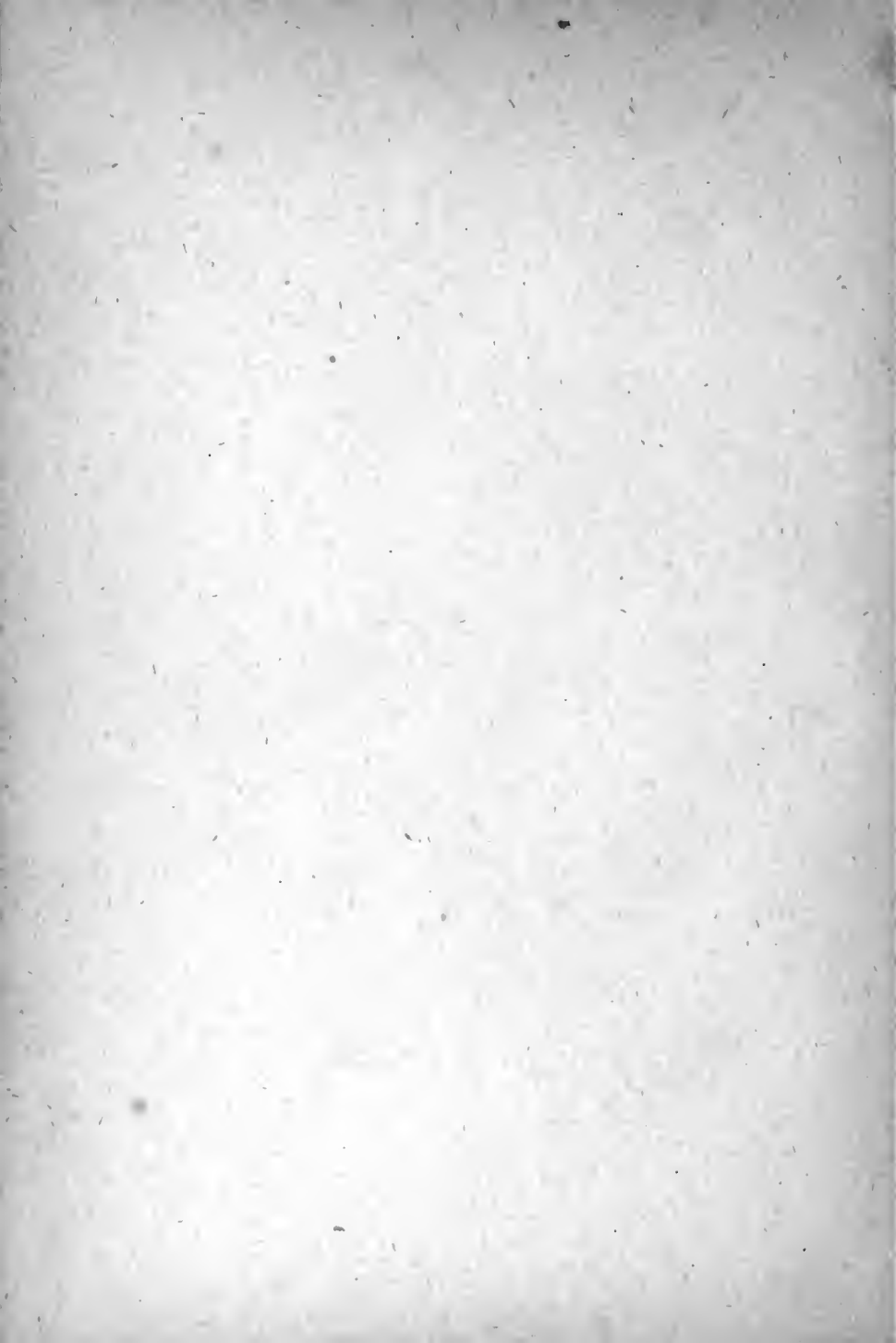
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MAN'S ORIGIN

AND

DESTINY

SKETCHED FROM THE PLATFORM

OF THE

PHYSICAL SCIENCES.

BY

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AND EMDEN.—STATE GEOLOGIST OF PENNSYLVANIA.—SENIOR SEC. AM. PHIL.
SOC. PHILADELPHIA.—PROF. GEOL. UNIVERSITY OF PENNSYLVANIA.

SECOND EDITION, ENLARGED.

BOSTON:

GEO. H. ELLIS, 141 FRANKLIN STREET.

1881.

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By J. P. LESLEY.

PREFACE TO THE SECOND EDITION.

TWELVE years have elapsed since the appearance of the little book which contains the first ten of the following lectures, and the author still finds people now and then reading it and asking for its republication at a price less unreasonable than that at which the London edition was sold. In the present edition I have expunged the eleventh lecture, on "Arkite Symbolism," as unnecessary; and have carried out the original intention of the course by adding six new lectures on "The Destiny of Man."

The notes appended to the former edition are here omitted, because they were merely indicative of the progress made in various branches of science, touching the history of man, during the two years intervening between the delivery of my lectures and their publication. To continue and complete such an appendix would greatly swell the size of the volume; and yet it would contain nothing but fresh illustrations of the general view presented, without materially modifying the integrity of the text, which is therefore reprinted from the stereotype plates, with only such corrections as were called for by typographical errors.

The form of lecture is condemned by critics who admire an essay or memoir conveying the same information and expressing the same opinions in essentially the same language. There is no good reason for this condemnation, except on the score of style; and the essay or memoir must necessarily lack that ardor of feeling and direct insistence of argument which characterize and fortify the lecturer. Besides, I may frankly confess that I have neither time nor strength to spend on the reconstruction of the literary form of matter whose justification must be found in its substance.

For seven years, since accepting the direction of the Second Geological Survey of Pennsylvania, I have laid aside scholarly pursuits, and especially those philological and archæological studies which, beginning in 1834, continued to be the recreations of a busy life till 1874.

Of course I have forgotten a thousand things which I would fain remember, and many a thread of original investigation, more or less promising, has been irremediably broken. Buildings stopped

in the process of erection fall back into ruins; and the scholar can claim no immunity from the operation of a natural law which sends the laggard to the rear.

But genuine loves never die; and the old hobbies of a student are installed in his affections like the statues of demi-gods in the niches of a temple. And life is too anxious, too wearing, a struggle with the actual, not to deserve some alleviation at the hands of memory and fancy. The sobered soul sighs for its spent vacations, and hopes and listens in vain for the hour to strike which shall announce the beginning of leisure and the resumption of play.

However much this work might be improved by being rewritten in better style, and with reference to later researches, I could hardly hope thereby to enhance greatly its power to produce the effect it has already had,—the only effect ever intended for it,—of stimulating one class of minds by certain new suggestions, respecting the correlation of the physical sciences with the history of mankind.

J. P. L.

PHILADELPHIA, August, 1881.

PREFACE.

THE lectures contained in this volume were written in the summer of 1865, at a distance from the author's notes and library. This will account for the paucity of special references, observable throughout the greater part of the book.

When delivered in the lecture-room of the Lowell Institute, the following winter, they were illustrated by numerous wall pictures, tables of statistics, maps and diagrams of various kinds, only a few of which are given as woodcuts in the text.

It is proper to add that, owing to the very judicious restriction of time to one hour by the rules of the Institute, not much more than the half of each lecture was read, except in the case of the last two, which occupied four evenings; the course being courteously extended by the honorable trustee to thirteen for that purpose. The twelfth lecture was, therefore, never written out, and is committed for the present to the imagination of the reader, with the suggestion, that it would better justify one portion of the title chosen for the book than anything actually to be found between its covers.

Circumstances made it impossible to print the lectures at the time they were delivered. Two years, in fact, have passed. New and important discoveries in archæology have intervened. A good many paragraphs have been inserted, therefore, in the text, and numerous foot-notes added. The simplicity of the original arrangement has been lost. The separate subjects of the different lectures have become, to a certain extent, confused; and portions of the book take on the aspect of detailed discussion, suitable only to a scientific memoir, while other portions retain their original character of bird's-eye view.

The author never contemplated anything beyond a general sketch of the present bearings of science upon the vexed question of the origin and earliest history of man. But the question has many subdivisions. He intended the several lectures to be separate sketches of these subdivisions of the field of discussion, mere introductions to their proper study. His views are stated, therefore, in round terms. Nothing is closely reasoned out. Much is left to the logical instinct, and more to the literary education of the reader. Reference is everywhere made to sources of information within

easy reach of all. Even the style of an essay has been avoided. The book is merely a series of familiar conversations upon the current topics of interest in the scientific world.

If its perusal start a single youthful mind upon the track of an original investigation — as the perusal of Harcourt on the Deluge, twenty years ago, opened before the author a new series of combinations of the facts of history and science — or if, without any deeper study of the facts alleged upon its pages, its general views inspire a single reader with more reverence for science, less fear of fresh opinions, a more intelligent curiosity about forgotten things, which still are at their old work in the modern world, and with a surer faith in the growth of human happiness, the author will be more than satisfied.

But even the mere retrospect of the labors of men of science upon the theme of this book has been so great a pleasure to him that he cannot repress the feeling that others must enjoy it likewise.

J. P. L.

LA TOUR DE PEITZ, VEVAY, SWITZERLAND.
Nov. 20, 1867.

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LECTURE I.

ON THE CLASSIFICATION OF THE SCIENCES.

IN considering how I can best open the subject of the present course of Lectures, I am reminded of a favourite saying of the greatest Lecturer that ever lived, and one whose lightest recorded thought has sunk, with the weight of a great principle of truth, into the consciousness of modern times:—

‘He that hath ears to hear, let him hear!’

One of the artists of New England told me that, in his opinion, no man could successfully paint a tree, a deer, or a dog, unless he first became one himself; unless he had pursued and been pursued; felt the freedom of the winds and waters, and that intimate brotherhood and fellowship with living things, which sharpens every sense to the quick impressions of nature. Enthusiasm is the mother of art.

Russell Smith, certainly the master scenist of America, built himself a cottage on the summit of the Alleghanies, in the heart of the primeval forest, and brought down from thence a friend, the finest elm tree in the world, painting it, as large as life, upon the great drop-scene of the Academy of Music in Philadelphia; where it still stands, spreading out its gigantic stem and splendid plume against a background of blue sky; and every branch and twig and leaf of it is real, for it was drawn in love. The artist summered it and wintered it as his bosom friend,

until he knew how every vein of sap which fed it, ran; until he could distinguish the voice of its particular foliage from the whole music of that wilderness, as a nice ear picks out and follows the part of some dear instrument in an orchestra, until he could recognize afar off every scar and moss-spot on it, as a lover can detect his heart's delight among a thousand other beauties at a ball. Love is the law of knowledge; and love is life in the beloved.

Rosa Bonheur in the cattle-yard; Hinckley among his dogs; Church sailing through ice-bergs and drinking into his soul the flaming northern skies; Espy upon his house-roof at Harrisburg watching live-long nights the formation and dissolution of clouds; Agassiz and Desor in their cave-house on the medial moraine watching through eight successive summers the motions of the glacier of the Aar; Hammond for eighteen months weighing his meat and drink to discover and explain the exact effects of whisky and tobacco upon the growth and decay of the living tissues of the human body; or that noble Frenchman, who, instead of flying, like the rest, from the mysterious plague, or fighting with it hopelessly and desperately because its nature was unknown, rather chose to make love to it; took it, as Delilah took Samson on her lap, to shear his locks of demon strength; shut himself in with it; watched the progress of the disease in his own body; recorded all its symptoms; explained its methods of attack; discovered its weak point, and gave with his dying hand to the world a remedy:—such men as these teach us the noblest of all arts—the art of Enthusiasm.

When the thinker becomes a speaker, he becomes an artist. His audience can justly criticise his subject only as they pardon his enthusiasm by sharing in it. He introduces to your acquaintance his oldest and dearest friends—thoughts, which to him are great thoughts, because they have commanded his best years. He paints in words before you the scenery of his soul's home; a mingled landscape, where the reason has ploughed and reaped by day, and the fancy loitered and listened and made love by night. He gives you water from a spring, the equal of which, he fain would have you say, exists not anywhere. He names you over all his orchard trees, and looks wistfully to see how their fruit hits your taste. He leads you

by his well-worn paths of argument, to points of view which have become the delight of his spirit; seats you where he has sat himself a thousand times entranced, and mutely begs you to worship with him before his wondrous Oberland. If he fails to inspire you with that delicious enthusiasm, he loses your friendship, and you lose his. If what to him are mountains of eternal truth, to you seem mist and fog, nothing is gained, and everything is lost; to you, the present effort; to him, the entire past. The teacher must be believed in—for the present moment, at all events; let the *conclusion* determine how justly. Cordiality is of more avail for the discovery and appreciation of truth than curiosity. Only when all cried, *Io Bacche!* together, the god appeared. And even the Divine Lecturer could only tell what the world already knew or was well prepared to know.

We all, no doubt, have favourite sciences. We all, no doubt, consider each one his own the flower and perfect consummation of the intellectual world. Does not the visible universe concentrate its glories in the individual eyeball? It is only by numberless shiftings of position that the human mind can obtain a generous perspective of all truths. Each science has its own domain, and is paramount lord within those limits. When it visits neighbouring potentates, it may be received with all the honours; but, when seated, sits subordinate, and must hold its sceptre with diminished dignity. The king is the first at court, but the general is first in the field. And what are king and general but no-bodies in the laboratory of Liebig or Faraday? And what are Liebig and Faraday but express packages to the mind of Captain Anderson in an ice-fog off the banks? Everything in its place,—everything to its purpose: that is the prime law. That differentiates the universe, gives it living activities, intense energies, precise results, variety of beauties, individual worth. But all for each and each for all, is God's grand spell upon his universe, by which he marshals its forces against disorder, and establishes eternal harmony; drawing slowly forth his silken rainbow-coloured ribbon from that mist of threads which hovers behind the loom. This is the charm of the science of the nineteenth century; harmony in diversity; multiplicity in unity. Never was the dissection

of single objects carried so far as by our special naturalists; and yet the dreams of the ancients were not so grandly universal as the panorama unrolled for contemplation and elucidation by modern philosophers.

Yet there is being established, with all this, a real order of precedency among our sciences. Some of them take naturally a wider range than others: geology, for instance. Some grow daily more and more departmental, functional, and ancillary.

The history of empires is the history of science. Their boundaries shift. Smaller states are absorbed into kingdoms. On the other hand, empires which have been indiscreetly enlarged by an agglomeration of hostile or unsympathizing nationalities, fall asunder, and out of the *débris* are instituted separate and almost independent *régimes*.

I will speak of Geology as illustrating both these tendencies. At first it was like one of those wild tribes of Germany that conquered the Roman Empire. It was a rude, undisciplined study of a few of the most prominent features of the ground. But gathering strength as it developed the observing faculties, and emancipating itself from its aboriginal superstition of the *Lusus Naturæ*, adopting the purer faith in Cause and Effect, it conquered and subjugated, one by one, all the other branches of human knowledge. The dukes of this new Burgundy outshone and outweighed their liege lords—kings and emperors. Its later princes—Von Buch, De Beaumont, Murchison, and Lyell, formed a splendid dynasty. The wealth of the whole world of science flowed into its public treasury. They were even not afraid to wage war against the world of metaphysics, and it seemed as though Church as well as State would be absorbed into one great, upstart, irresponsible despotism.

But how is it now? Geology, as an empire, exists no longer. Instead, we see three kingdoms: three kingdoms so separated, that no one who rules in the one is accounted of the highest authority in the other two. 1st, We have the science of Structural Geology, which may be said to represent, somewhat, the old science before it was divided. 2nd, We have the science of Palæontology or Fossil Geology, which first succeeded to the power of the old empire,

and has for some time past been dominating, with a touch of arrogance too, its structural neighbour. And 3rd, We have the science of Chemical Geology, a new and rising state, full of enterprise, and destined to absorb the confederate states, known, in scientific parlance, by the name of Physics.

And yet these three are one. Nor can a student of nature account himself well-bred unless he travels through them all; although he will accomplish nothing great unless he naturalizes himself, and makes a home for himself, in only one of them. But what will not then that home of his become! What a castle of intellectual strength! What a cloister of various learnings! What a museum of antiquities! What a rendezvous of the choicest spirits of the age!

Let me imagine myself for one moment a geologist, well established in such a place, occupied with the study of the formation of this earth, its sedimentary and metamorphic and volcanic rocks, the faults it has committed, the plications and contortions it has endured, the mineral veins deposited in its fissures, the organic forms it has entombed, its reservoirs of brine and oil, its burning mountains, its earthquakes, its changes of sea level, its glaciers and moraines, its golden gravel, its meteoric stones, its ossuary caves and deposits of worked flints, its motions through space, its influxes from the sun, its beginnings in eternity. Can any theme be more capital, more universal? Is any science excluded? Is any question impertinent? Must I not subpoena everything that lives, and that does not live, before this case is through? Has not every savant of the Academy something to tell about it?

The architect and civil engineer begin by relating their experience of the choice of granites and clays, the weight and strength of building materials. The miner and the metallurgist recount me their latest improvements in raising, selecting, and reducing the various ores. The chemist hangs upon my wall his nicest table of equivalents, and explains me why the *magnesian* limestones were the *first* ones formed. The zoologist and the botanist lay upon the table, on each side of me, their latest enlarged and corrected synopses of fossil and recent synonymes. The Archdeacon of Calcutta employs his heaviest mathematical sym-

bols in weighing for me the plateau of Central Asia, while Thompson and Hennesy are calculating the maximum and minimum possible thickness of the crust. With his new automatic tide gauges, and with the waves produced by the earthquake of Simoda, Bache gets for me the mean depth of the Pacific, while Darwin and Dana decide, from the arrangement of their coral reefs, the number and direction of its belts of alternate elevation and depression; Sabine and De Struve report the progress they are making in determining the earth's exact departure from a globular form. Astronomers swarm about me with their speculations upon cosmogony, and assign various reasons why the earth's nucleus is hot or cold, is fluid or solid, and why it must have sprung from the consolidation of a nebula, or why from the conglomeration of an infinite number of meteors. The Alpine Club petition for the pleasure of my company on their next ascent of Mont Blanc; and even Ruskin, the artist, insists on fixing me in a good light, so that I may catch the genuine bedplate lines on the precipices of the Arve, and never again make the absurd blunder of mistaking the cleavage of the shists for original stratification.

Is it any wonder that the poor geologist's head is turned by so much attention? That he accounts his own particular science the summum bonum of truth? Yet in almost an equal degree may the physicist, the astronomer, the naturalist, the archæologist, the metaphysician cheat himself with the sweet delusion, that he sits at the centre while others stand around. For let a soul, by purity, patience, and love, tame but one science, and it will have, like Una with her lion, the freedom of the whole forest.

What, then, is the real order of the sciences? Or is there such a thing? Or is knowledge like a hollow sphere, within which the soul of man feels itself floating between equal attractions in all directions? Is there any hierarchy of the sciences? Is it as noble to know, as ennobling to determine, the number of rings constituting a genus among myriopoda, as it is to discover the number of vibrations corresponding to a given colour in the rainbow, or the number of formations deposited with their successive floræ and faunæ in all the ages from the Lawrentian era to the present time? Or, setting this æsthetic ques-

tion on one side, can the human reason find no just arrangement of the sciences, by which our ideas of progress and development may be realized, and their natural subordination and interdependence so shown forth as to satisfy our love of perspective?

Others may answer this question in other ways. The remaining time, which your politeness will allow to this lecture, cannot perhaps be better consumed than in stating, as clearly as I may, the order which appears most natural to me, when I attempt to classify the various departments of human knowledge. And I find myself in a manner compelled to make this preliminary statement, since I have chosen for the subject of the present course of lectures, 'the relation of the modern sciences to the primeval history of man.'

Do not imagine, from this title, that I intend to develop in formal style, after the manner of the German metaphysicians, a history of philosophy. I willingly leave that immense task to the vivacious eloquence of Erdmann, prince of Hegelians, and to the golden pen of Whewell, vice-chancellor of induction. I have a much more special design: to show how the bonfires we have lighted and are feeding with fresh fuel every day, cast back their illumination through the forest and over the moors of history; bringing out from the thick night and distance bizarre but moving forms, progenitors of our progenitors a hundred times removed; lighting up their savage features, not wholly bestial nor insane, not wholly destitute perhaps of some angelic or Adamic excellence; so that we may specify some of those earlier forms of soul to which was given this planet for a habitation, and be able to make out the original nature of many things which gibber and mowe at us through the dim past, as if they were supernatural attachments to our history, evil genii, impertinences and intrusions on the premises of our race, and not amenable to any exorcism except that performed with fasting and prayer. It is my firm belief that the time comes for explaining the beginnings of human life upon the earth; that if all the sciences can be brought to act in concert they can do much towards already setting up primeval archæology upon its future throne. I shall endeavour to show—I am sorry I can only do it sketch-wise

—how we can combine the results of the geologists, the ethnologists, and the linguists, with the creations of the priest, the poet, and the architect, to restore and re-colour the faded, broken fresco-painting of the ages on the walls of the temple of history. But to accumulate evidence we must examine the value of each witness. And the first step is to call the roll and swear them in by name and residence.

The earliest attempts to classify knowledge distinguished between the *natural* and *supernatural*; between the *physical* and *metaphysical*; between that which relates to phenomena appreciable by the bodily senses, and that which relates to the essence and power of things, the moods of intellect, and the status and intentions of Deity. Of the first-named distinction of the subject-matter of human knowledge into the *natural* and *supernatural* I may have occasion to speak at large in a future lecture, because it has been much misunderstood. The second distinction, viz. into *physical* and *metaphysical*, although it maintains its importance, in a measure, to the present day, is felt by every thinker to be so general and so vague, so indistinct in the light of modern investigations, that it remains in use only as a popular convenience for common conversation.

The word physics, from the Greek verb *fuō*, I grow, means the science of nature seen under the conditions of growth. But we need to introduce among the sciences of nature's growths the sciences of nature's *forces*, with many of which we have become experimentally acquainted. These forces are no longer considered as outside of nature, or above nature (*metaphysical*), they are no longer gods and demons, but *laws*. In fact, modern science has transferred the name physics entirely to the discussion of this class of sciences, including the knowledge and use of numbers and quantities. The word 'physics' now means the teaching of the *growth-causing* agencies: light, heat, electricity, galvanism, magnetism, gravity, &c. And the utmost to which the meaning of the word is ever extended only takes in the application of the experimental knowledge of these forces to the sub-sciences of astronomy, meteorology, and geodesy. All true *φυσικῆ* is now no longer discussed as 'physics,' but as 'natural history;' the growth of plants; the growth of animals and man. And

yet this growth is effected by a force which has not been enumerated among the physical forces, and is not even alluded to in the science of physics proper, viz. the form force, the *forma formans* of the schoolmen; that idea of itself which every growing being has how it shall form itself in growing. This has nothing (so far as we know) to do with what we call mind, reason, instinct, or any of those fruits of brain-structure or nervous organization, which are the special objects of study of the intellectual sciences; but underlies and antedates them; inasmuch as the form-force even determines in each family, genus, and species of beings, whether there shall be a brain or not, and what rank its intelligence, reason, or instinct shall take.

This living form-force is the true basis of the sciences of natural history, 'distinguishing them from the science of the imponderables, or the 'so-called physical forces of space.

But there is also what may be called the dead form-force, which acts (equally beyond our comprehension) through the inorganic or *non-growing* world, producing all kinds of crystals, minerals, and rocks; determining their shapes also, with as despotic a decree as that which fatalizes the shape of a tulip tree, or of the panther that stretches himself in ambush along its branches. In fact all the crystalline world is as much a 'growing' part of nature as are the vegetable and animal kingdoms.* But we suppose them to grow under the operation of the purely physical forces only; and therefore we place their sciences of chemistry, mineralogy, and geology, between pure physics and pure natural history.

In the historical development of all the sciences lies are the beginnings of truth. That Helen, whose beauty set the world at arms, began existence in a shape so hideous as to be concealed for nine long months from every eye. Criticism then, even the criticism of love, would have been fatal to her. So has it been with each embryo science. Hidden in the ignorance of Plato and of Aristotle, in the so-called history of Herodotus and geography of Strabo, were the germs of some of our grandest sciences;

* See the beautiful sap-growth of Arragonite in the caves of Derbyshire.—Q. J. Geol. Society, Lond. xxi.

ethnology, philology, sociology, theology; the natures of which being nobler than those of the physical and natural sciences, inasmuch as they deal entirely with man, man's soul and God, God's providence and institutions for the future, require longer to mature, and are therefore still not so far advanced as they might be; but in those early days they were like the Hebrew poet's chaos, *tohu-va-bohu*, without form and void.

Those tales of the Makrobioi, or long-lived happy patriarchs; of the Lotophagoi, nature's own epicures; of Pigmies and Troglodytes; of men with tails, and men with but one foot, and that one large enough to be of use at noon for an umbrella; of Arimaspians and cannibal Massagetes; of satyrs and ogres; of Niobe and Lot's wife, and whole nations turned for their pride into marble statues; of Deucalion and Pyrrha, Nimrod and the Tower of Babel, Cadmus and his dragon's teeth, Pelasgus, Dorus, and Æneas, and the numerous lying genealogies of nations, accepted then as all-sufficient explanations of the course of events preceding the times of their authors, and rejected by us as figments of the imagination,—were these not the faint first flutterings of the unborn and yet unfashioned fœtus, which has grown in course of ages to be that thing of strength and beauty which we name ethnology, the science of nations? that queen regnant of the human sciences, daughter of chronology, and mother of history, whose two fair sisters sit at each hand of her—mythology and archæology—an imperial group!

It is impossible not to feel that we are taking human studies in their natural order. First, *thoughts*; then, *things*. In the beginning was the Word; then the Word was made flesh, and dwelt among us. We must go backward, not forward, to obtain the absolute; for out of the abstract conception comes forth the concrete reality. Before the universe was God was; and with him dwelt the eternal and immutable relations of number. Mathematics and Physics give us the prime postulates of all creation. This is the group of sciences which must necessarily lead the procession.

Then follow the incarnations of numbers and forces in matter, giving us chemical and geological laws for the

creation of the lowest and oldest, the inorganic world. Thus we have our second group.

Then come the organic sciences as a third group, carrying up the scheme of life to man.

Fourthly, we have the historic sciences ; discussing what man's life has been, from his appearance on the planet until now.

Then rise grave questionings—what man's life *ought* to be. From these questionings, begun by Pythagoras and Plato long ago, and continued by philosophers of all ages, a steadily thickening crowd (become at last so great that we may affirm with truth, in this year of 1865, that all the thinking men and women of Europe and America are in it), there has been elaborated a new science, Sociology, the doctrine of Right Society ; or, rather, a fifth group of allied sciences under the various names of Statistics, Finance, Construction, National Defence, and Equity. Each of these has its facts and its theories, its principles and its history of practice. Mankind was made gregarious ; society has always existed ; manufactures, commerce, war, and law have always been, and must always continue to be, its four methods of self-expression. No others can be named. On their well-collated statistics must be established all our just explanations of history, all our successful schemes of philanthropy, all politics that may escape reproach. Statistics are the mathematics of Sociology ; and the Treadwells and Stephensons, the Barings and Girards, the Napoleons and Grants, the Blackstones and Marshalls of modern times, are as much men of science, if not of as high a grade, as Pascal and Descartes, Leibnitz and Newton, Peirce and Henry, Berzelius and Dumas, Owen and Agassiz, in the so-called world of science. To freight a Great Eastern with living souls for a land of liberty is a grander achievement of the centuries than to transmit the price of American gold by submarine telegraph to the Brokers' Board in London, to be used in behalf of vested wrongs for back-holding the progress of humanity. Nor is it to be doubted for a moment by a Boston audience, at the close of the Great Rebellion, that the Atlantis of Plato was a crude boy's dream compared with that splendid vision of a justified and sanctified Republic, founded on the experience of the Saxon

race in a new world, equipped by all the arts and sciences, instructed by Christianity, and invested with liberty, prophesied for the last thirty years by your own immortal William Lloyd Garrison, and now almost fulfilled. In this large workshop of the Free States of America, the whole rolling stock of civilization is being reinvented, tested, and started off afresh upon the track of history. In the schools, and courts, and legislatures of these commonwealths, the social sciences are rapidly attaining that nice precision and that generous scope which already characterize the mathematical, the organic, and historical sciences, with all of which they are so closely allied.

And now, if I have not already wearied your patience, I must instance still another—the last and noblest class of all the group of the intellectual sciences. Those which I have already described relate to the measurement of space and time, to the attributes of matter, to the growth of plants and animals, to mankind as part of the animal world, and, finally, to mankind in masses, obedient to physical necessity and planetic circumstances. But these relate to *Man*. These teach the expressions of a supernatural nature; of a spirit which we believe to be immortal, self-conscious, self-studious, inventive and creative, open-eyed, and tongued for speech, responsive to all mysteries, and destined for all glories.

The base and platform of this pre-eminent group of sciences is Language. Philology is the mathematics of the soul, teaching us the rudiments of utterance. The sciences of feeling are named Belles Lettres and the Fine Arts; Logic is the science of thought; Ethics the science of conscience. All these are old. Modern Christianity has added two more to the list, the sciences of Education and of Philanthropy. And, to make the whole complete, we must end the long catalogue with the science of worship, that is, Religion.

In order to refresh our memories, and keep perfectly distinct these different groups, with their elements, I have hung upon the wall the chart which you see before you. It was a scheme constructed to classify the books of a large and miscellaneous library. And for practical use its different sub-divisions or classes were distinguished by the primary colours of the rainbow, in their natural order from

red to violet. The backs of the books were marked with these colours, and the cards on which the titles of the books were separately catalogued were also of corresponding hues. But you have probably already noticed that instead of six classes, the scheme upon the wall has eight; the first one, white, for science as such, or human knowledge in the general; the eighth one, violet, containing but one name, and one which I have omitted to mention in my foregoing remarks. It is not a science, properly speaking, yet. But you will all perhaps agree with me that it ought to be. We may, however, well despair of it when we remember that the greatest of fools, Boswell, wrote the most delightful of biographies. Yet it is so far forth a science that it stands apart from the rest; dealing not with mankind as animals, nor with mankind as a race, nor with mankind in society; nor with man's life in the studio, in the lecture-room, or in the church; but with men, as men; each mortal by himself, sitting for his picture before the lens of Truth. In its intensest form, as Autobiography, it is the science of one's self; the summation of knowledge, for God is unknowable, except as reflected in his image, man; and man's individual life collates into a personal history the entire circle of celestial and terrestrial phenomena, mimicking like a falling raindrop the surrounding universe.

In all ages, since the invention of letters, attempts have been made to immortalize the heroes and prophets of the world by writing out their lives; and most of the knowledge of the ancient world which remains to us, has descended in the form of biography. The pictures which forgotten scribes have painted of Moses, and Joshua, and David, and Isaiah, and the Maccabees, are among the most precious legacies of antiquity. What is more exciting than the life of Pythagoras by Iamblicus? or more delightful than Plutarch's Lives of noble Greeks and Romans who had lived before his day? Yet after all that scholars can say of them, the biographies of the ancients were failures, in comparison with the best of modern times, because of the meagreness of ancient life, the difficulties of intercourse, and above all, the narrow range of ideas, owing to the limited education of the writers.

In this, pre-eminently, the difference shows itself between ancient and modern days. *We* skim the ocean and

devour the land, collecting facts by steam and transmitting them by telegraph. *They* consumed half their lives in a few snail-pace journeys and baffling voyages, confined within the compass of a thousand miles, a prey to terrifying accidents, victims of unblushing falsehood and unbounded ignorance.

The crowd of modern travellers and writers is so great that every lapse from honest observation, every mistake of eye or ear, every inept construction, every misquotation, every false assumption, every distortion of word or deed through pride or prejudice, every failure of appreciation by stupidity, every undue exaggeration by affection, every mistake of superstition, is sure to be corrected, almost as soon as made.

But in those ancient days the lonely priest went plodding on, year after year, reaching occasionally some monastic home where he could find a week's or a month's repose, as a rare and welcome guest from foreign lands. And there he heard, without the power or wish to criticise, extraordinary tales, incredible to modern minds. None had been there before him by whose judgment he could guide his own belief. He wrote all down. And for a century, perhaps for twenty centuries, no traveller would follow him to verify or falsify his stories. You see how little chance Sesostris, Cyrus, Zoroaster, or Lycurgus had to get their biographies recorded properly. But even if the truth about them could have been attained to, and even could we summon them in person before our Niebuhrs, Macaulays, Michelets, and Prescotts, to be cross-examined, on their oath and honour, would not each of them be apt to answer in the words of the knife-grinder: 'Lord! I've no tale to tell, sir!' For the manifold relations which men of mark and genius in the nineteenth century hold to all departments of art and knowledge, constitute the chief difficulty in the way of writing their biographies. And at the same time this difficulty, well wrestled with, by men of equal mark and genius, has carried up the tone of life-writing to the pitch at which we have it.

Had there been an Edward Forbes in Plutarch's day, we should have had a Wilson or a Geikie in Plutarch to describe him. For Nature is the best Quarter-master, and never hesitates to fill an order when it is properly red-

taped. But there could be no Edward Forbes in ancient days for the same reason that there were no elephants nor monkeys in the Jurassic age, nor pterodactyles in the Devonian era, nor lepidodendra in Silurian times. All things wait their turn. The genius of development is a fine scene-shifter. The Demiurge works leisurely, and hates to be hurried. Time is of no account, but circumstance is indispensable. A perfect Biography requires a type Man. Men are just now beginning to write the Life of Jesus, because the life of Jesus holds closer relationship with the millennium than with the middle or the heroic ages, and demands for its comprehension the knowledge of universals, rather than particulars. The general working of his spirit upon and within the constitution of the world, had to be, not tested, but testified by the experiments of twice a thousand years before its all-embracing applicability, its never-failing certainty, its infinite many-sidedness could be assented to by science. Crichton must visit all the courts and universities, and conquer in every contest of etiquette or eloquence, before he can be called the Admirable. And each of the centuries is itself a separate court and university, at which the growing humanity takes some new degree.

The true science of biography is professed by the great novelists of the day. We see its growth in reading the works of Goethe, and Scott, and Thackeray, and Victor Hugo, and their thousand pupils in the divinest of all arts, the picturing of human life. These are the teachers of the nineteenth century. These are the books into which have fallen the treasures of learning and wisdom of all the ages. Christianity, honour, politeness, wit, and humour are taught now chiefly through novels. They are the mirrors in which the many-sided power of the modern world contemplates itself. Each man, each woman goes to the novel now to get such glimpses of their inner life, and their outward relations to nature and mankind, as thrill them with emotions of pride and love, plunge them in remorse, lift them again with hope, confirm their fresh-born resolutions, and warn them against insidious dangers. The good that Charles Dickens has done the world is incalculably great. I should rather be Charles Reade and have written 'The Cloister and the Hearth,' than have

been Gibbon, and have written 'The Rise and Fall of the Roman Empire.' One American city now is larger than the whole Roman Empire was in the days of its splendour. We must measure matter spiritually, to get its just dimensions. Compare Horace with Tennyson, or Cicero with Sumner, or Augustus Cæsar with Abraham Lincoln, if you wish to see how the world has grown in the richness of its relationships, and how the development of man as an individual has kept pace with it. Barren enough would be, even could it be written, the biography of an aboriginal savage.

How far backward we shall hereafter be able to trace this law of human development it would be rash for me, or for any other man, to say with dogmatism. Nor do I desire to take up the vexed question here this evening. The sciences which it has been the object of this lecture to classify are not themselves sufficiently developed to settle it. Mankind still wear too disagreeable a resemblance to their apes, the quadrumana, to argue it. From that elevation which the Christian strives to reach, where the last trace of hog and tiger and baboon will leave his nature, and he shall rest, transfigured, at his Master's feet, and feel himself a worthy friend of angels—perhaps he may hereafter look down, without those uncomfortable emotions which even the fairest discussion of the origin of man gives rise to now. Enough, that so far as written history is concerned, and some dim glimpses into pre-historic times can be obtained, the law of human progress, of social, mental and moral development is a great certainty on which all our learned histories and philosophies are based; and without its clear and consistent recognition all reference to the early ages of mankind will be mere losing ourselves in Sorbonian bogs and Hercynian forests, filled with

"Perverse, all monstrous, all prodigious things,
Gorgons, and Hydras, and Chimeras dire."

It is my intention in this course of lectures to attempt to show how far the sciences, as they are now advanced, succeed in throwing light upon the early history of our race. I do not know that I need make any apology for the choice of this subject in preference to one more strictly

professional: although it is by no means, in the language of the world, a useful one. But I feel sensibly the tendency of our times to utilitarianism and materialism. I think it is wise sometimes to shut up shop and walk in the twilight, and look up at the stars, or down upon the sea. The end and object of all science is, not to print calicoes, but to brighten up the face of man. And if the thought of ages long ago can breed within the human heart one sentiment of pious contentment with its lot, or one hope of future happiness, or any increase of that faith which believes that all things are well ordered and sure, and work together for the good of those that love God,—that thought of ages long gone by is useful.

But the mere attempt to reconstruct the past is favourable to our knowledge of the present. In no way can we better judge of tools than by building with them. I purpose in this course of lectures to test the temper of our sciences to see if they will break on one of the hardest of all subjects of discussion. In doing this we will pass in review, as it were, their capabilities. This of itself will well repay our time.

The chief charm of all such subjects as the one I have chosen lies in a sort of super-naturalism which floats about them like a haze; tinting them purple and gold as the air at sunset tints the distant mountain-tops. In our daily life we feel the hardness and roughness of matter until our souls are sore and faint. But when we turn to the far distant past we feel this hard and rough material world melting and mixing with strange fancies, pliant laws, conjectural processions of events, cloudy possibilities, and over all the bending form and earnest face of the All-Father at His work. So sang the old Hebrew bard:—‘I am Sophia; I am the abstract wisdom; I was with Him in the beginning, when He laid the foundations of the earth, and the morning stars shouted for joy.’

The ancient histories, like the primary rocks of the North, are all rounded and polished and streaked and beautified by the slow movements of the Recent over them. We may find columbines here and there blooming in their rifts.

It does us good to cultivate the grand superstitions which are indigenous to that mountain-land. What is

super-stition but the posture of the human soul when it stands erect and treads brute matter under foot. We talk of our *under*-standings: Yes—but what of our *over*-standings? We men of science of the nineteenth century are becoming too exclusively men of understanding. ‘I will speak,’ said Paul, ‘I will speak with the understanding and the spirit also.’

All I would say in this introductory lecture is this: that I do not believe in a beginning without God, any more than in an end without Christ; and therefore you may expect to hear me treat all the parts and details of the investigation into the early life of mankind on the earth, not only by the rules of the Naturalist, but also in the spirit of the Spiritualist; and with a profound faith in Christianity as the blooming of the century-plant.

The modern sciences conspire to prove that man is an animal, and that his history is bound up with the zoological developments of the remotest geological times. But this does not injure the discussion of his spiritual faculties and his immortal future.

The sciences agree in impressing us with man’s subjection to the physical laws which are so despotic over all other departments of nature. But this need not blind our eyes to the function of the Will; to the laws of right and wrong; the reality of responsibility, and the alliance of the soul with superior natures, unseen as well as seen.

The sciences enjoy together a code of criticism, which they make obligatory upon the student of the past; a code too little known, too long neglected by the students of the past. By this criticism we will find all written history false or defective; and all human language so overcharged with the effete decomposition of ancient ideas and practices, as to make philology rather a barrier against, than an avenue towards, the knowledge of antiquity. But on the other hand, is *that* to overthrow our faith in the sublime traditions which we have from those old times? The light of antiquity streams into our Church of the Present through wonderful stained windows—and is all the more ravishingly beautiful, and quite as useful for all that. While we learn that no ancient Scripture is to be believed,—we learn also that *all* ancient Scripture is to be believed. When we turn towards the future we see as

through a glass darkly, but still we see ; and all the better by the nearer we bring our eyes to the glass that stops our vision. So when we turn towards that other eternity, the past, we see as through a glass darkly, but still we see ; and all the better for the criticism which has been reduced to such perfection by the labours of men of science in our day.

I repeat then, that for the truthful and useful discussion of the relations of the modern sciences to the early history of man, it is necessary for your lecturer to believe as profoundly in the essential and indestructible principles of the Christian religion as in the axioms of Euclid or the law of chemical equivalents. Nor has the slow progress of the sciences of geology and comparative anatomy done more to retard our knowledge of primeval antiquity, than has the unchristian state of the theological and social sciences.

In my next lecture I will illustrate the difference between the ancient forms of knowledge and our modern sciences ; and show how impossible it is, without the help of a cultivated fancy, to investigate the natural history of an age of human existence, over which an uncultivated fancy bore entire sway.

In the third, the fourth, and the fifth lectures of the course, I will treat of the antiquity, the dignity, and the unity of the human race. I will devote the sixth lecture to the social life of the ancients. The seventh lecture will be on the origin of language. The eighth on the origin of taste and the development especially of architecture. In the ninth I will give you my theory of the origin of letters ; the invention of the alphabet ; and the nature of those spiritual fancies which became concrete in the mythological traditions of the world. My tenth lecture will treat of the religious instinct, and its embodiment in ceremonial worships. The eleventh will be devoted to what I consider the most ancient symbolism of the priesthood.

If I make my views clear to an audience so exacting of precision and completeness as this is sure to be, it will be more than I dare to hope. But at all events I can give you some faint sketch of the expanse of the knowable which lies before the soul that reverently and lovingly undertakes to question Heaven and Nature about the beginning of its kind.

LECTURE II.

ON THE GENIUS OF THE PHYSICAL SCIENCES, ANCIENT AND MODERN.

IN the last lecture I gave you a classification of the modern sciences in eight groups, the first group representing science in the general; and the second group comprising the mathematical, exact or physical sciences proper.

My lecture this evening should show you the relations of this second group to the early history of man. In other words, should answer the question, how much information the mathematicians, the astronomers, the meteorologists, the geodesists, or physical geographers, and the students of light, heat, electricity, motion, &c., can give us respecting the planting of human society upon the earth.

Not much. No! not much. But yet a little.

Before I recount this little, I have something more, introductory, to say respecting the right which modern science has to speak at all upon this subject; a right, as you are probably well aware, denied; denied by the pulpit; I mean, of course, by the uneducated and more ignoble part of the pulpit. For science has already won stalwart champions from among the clergy; and we less seldom now are forced to listen to those storms of mingled arrogance, absurdity, and bad taste, which formerly made of the pulpit a very cave of Eolus; those discordant denunciations of dangerous novelties, through the loud uproar of which were ever to be more easily distinguished than any other sounds the warning words of Paul to Timothy: 'Keep that which is committed to thy trust, avoiding profane and vain babblings and oppositions of science falsely so called, which some professing, have erred concerning the faith.'

A thorough-bred and noble-minded theologian will scorn

to turn against himself this beautiful apostrophe of the philosophic and great-minded apostle, this wide and tender appeal to the fresh heart of Christianity to keep itself from the intellectual idols of that day, the demoralizing sophisms of Athens, and the crazy Gnosticism of Antioch and Alexandria;—against his own inner life; against the education of the 19th century; against these ennobling and refining sciences which have been born of Christianity in her best estate and glorify her on earth as the spotless robes of her elect will glorify her in the heavens.

Let us comprehend, then, before we go one step further in this course, the difference between the so-called science of the ancients, of which Paul spoke, and the sciences of modern times, which he knew nothing about.

They differ in two respects, the most essential possible: 1, In their genius, or animus; 2, In their method, or apparatus.

1. The genius, or animus, of the ancient science was essentially fanciful; childish; cared little for consistency; was inexperienced; preferred to believe; was impatient of criticism; had no *purpose* in its investigations; no use for their results.

The spirit of modern science is just the contrary;—practical and manly; at once critical and comprehensive; more disposed to deny than to affirm; insists upon all things being put upon their trial; rejects even truth herself if she stammers before the court; cross-examines without pity; insists upon absolute consistency; is regardless of consequences; takes nothing for granted; worships cause and effect; investigates always in the light of some hypothesis, and applies every discovery instantly to use.

2. In the second point, of Method, the difference is equally patent to observation. The method employed of old was as fanciful as the spirit. The only intellectual tool above the level of their senses, which the ancients had to work with, was their quick and fertile imagination. With this they reasoned. Their powers of observation were fine, but they neither knew what to look for nor how to correct false observations, nor how to combine what they knew, so as to frame laws by which to carry on the work. What little they got, the most of it was worthless; and what was valuable they soon lost. There was no con-

cert among their sages. They washed the gravel, but could not crush the quartz. They merely worked the out-crops of knowledge, because they had neither engines for deep mining, nor railways to take away the ore, nor furnaces wherein to bring the metal to nature, nor laboratories for assaying its purity. They wrote books, but there were no reviewers. In a word, true science was as impossible a product of the human mind so long as the fancy fished and hunted through its primeval wilderness, as commerce and luxury and art are impossible until the invention of the axe, the plough, the anvil, and the loom cause the physical forest to disappear with its wild denizens, and farmers, artisans, and townsmen to take their place.

The whole story is told in one sentence, when we say that modern science replaces Fancy by Experiment. Its whole profession is inquisitorial. It tortures the dumb truth. To say what you can prove is the only passport to its favour. None of your suppositions, is the only response it deigns to give the sciolist. It is harder on contractors than any army-inspector at Springfield. It cares for no expense in renewing and improving its machinery, and keeps selling off its condemned material to charlatans. 'Be sure you are right; then go ahead,' is its favourite saying. It may wink at the fancies or inaccuracies of a favourite over-night, but woe be to him in the morning! With its whole soul modern science hates idols—those that Lord Bacon classified, and all others,—and despises hero worship. It encourages predictions as stimulants, but murders the prophet whose vision comes not to pass; yet it has great patience when the prophecy is both very new and very grand.

You will notice then that the great distinction between ancient and modern science is this: that the former was the product of undisciplined fancy, and the latter is the product of careful, repeated, and systematic experiment; simply the difference between *conjecture* and *knowledge*. For fancy and experiment are the two poles on which the world of human knowledge turns. Or, to change the simile, fancy is the steam which lifts the piston-rod of intellectual progress; experiment, the guides in which it moves.

Now let me apply these ideas to the first member of the group of mathematical sciences with which we are dealing to-night; the science of numbers. It affords us a fine illustration of the difference between ancient and modern science. I do not speak just now of the aboriginal ideas of numbers which the earliest tribes of men obtained in their savage state. I shall speak of that directly. And I use the term 'ancients' in its common sense, meaning the classical ancients, of whose life and doings we have some traditional history.

The ancients invented arithmetic and geometry, but the moderns have possessed themselves of that all-powerful apparatus of investigation, the differential calculus. The ancients had a fanciful or superstitious reverence for numbers, believing them to embody an occult and fearful magic, according to which the universe was originally created, and under the influence of which all life was thought to move. The moderns love numbers, because by them they can work out in a reasonable and precise manner both the darkest and the noblest problems of creation—the distance of the stars, the weight of the planets, the velocity of light, the composition of matter, the progress of population, the rate of insurance on life and property.* The mathematics of the ancients could produce nothing higher than astrology; that of the moderns has produced astronomy, meteorology, geodesy. Its last and crowning triumph has been the establishment of the law of the 'convertibility of forces,' by which we now know that not the smallest portion of the universe is ever lost; that motion, when it stops, becomes so much light and heat; that light and heat, when they distribute themselves, supply to nature an equal quantity of electricity or galvanism; that galvanism becomes magnetism; and that magnetism gives place again to motion. Did St Paul mean to say that all *this* is 'science falsely so called'? Is this the *γνῶσις* that he denounced so vehemently, as opposing itself to all that Jesus Christ had given him to hold in trust until he should come again to judge the world in righteousness? I trow not.

Let me call up before your imagination that great vision

*The truthfulness, the reverence of exact statement and description, which distinguishes the occidental from the oriental man, may be deduced, perhaps, rather from this influence than from any other source.

which stood to the ancient philosophic world for the sum of all speculation upon the way God made the worlds. It was their *γνωσις*; the doctrine of the Gnostic or Oriental world. I leave you to judge yourselves how much science there was in it; and how wisely, seeing its intense, proud, irreconcilable opposition to the Gospel of Christ, Paul warned his followers not to be seduced from their holy faith by it. In one form or other the whole mathematico-physical science of the ancient world consisted in this cosmogony. It stated its fanciful principles thus:—

1. That matter and spirit are the two hostile elements of the universe.

2. That there can be no intimate intercourse between the Absolute, pure spirit, God, and the Material, gross, vile, sin-producing, chaotic, rebellious, and insane stuff out of which bodies are made.

3. That therefore the universe must have resulted from the existence and operations of energies or intelligences holding an intermediate place between the Absolute and the Material, filling up or bridging over the awful chasm between God and Matter.

Upon these assumptions, and this comprehensive syllogism, a thousand fanciful philosophers erected their cosmogonies; like the cathedrals of the middle ages, all different, but all belonging to one style; some smaller and plainer, others imposing for their immensity, bewilderingly complicated, and covered over with elaborate ornamentation. The central idea of all of them was that of emanation. Eons came forth from the Divine essence as deftly and numerous as ribbons from a juggler's mouth. Down slid the long Jacob's ladder, with an angel or archangel standing upon every rung, until its foot touched and rested firm upon the mass of crudity to be informed. High at its summit stood, waving her wings, the Celestial Sophia, and at its foot the Demiourgos or Creator of the earth, the Jewish Jehovah, with face downcast, and brawny arms, the Terrestrial Sophia always by his side. And this was the most advanced philosophical statement of the origin of men and things that the science of the ancients ever succeeded in making; and modern science can detect in it neither rhyme nor reason, because it was neither based on observation, nor calculation, nor experiment.

Let me set before you now another and far different picture. That was 'science falsely so called;' this is true science. It may not be scientific truth, for its demonstration has not yet been completed. But it is *true science* for all that; because it is the product of a Fancy disciplined, mathematical, experimental, and observant. I allude of course to the Nebular Hypothesis.

The Nebular Hypothesis is to us modern naturalists what the gnostic cosmogonies were to the cabbalists of yore, and is illustrated in a perfect manner by the genius of modern science. It has swelled rapidly to its present proportions by insensible degrees; by yearly accessions of facts, discovered and recorded in the different departments of inquiry. Its constitution is purely mathematical. Grant its one postulate,—That space was originally full of homogeneous matter obedient to the laws of physics—and its whole argument follows logically to the close; and it accounts for everything we see and know about the visible world. And this first postulate is strictly *reasonable*; even if it turn out in the end not to have been *true*; for 1, It agrees with all experimental observation as thus far made; and 2, It is based upon a set of observations of its own. I mean the observations of telescopic nebulae. Nor can it be finally disproved and laid aside until more powerful telescopes shall have been made to resolve into separate stars the last remaining nebula. And even then the *à priori* possibility stands good. Saturn's rings will continue to discuss the question with any comet that may happen to drop in.

Emanation was the genius of the old cosmogony; *Evolution* is the genius of the nebular hypothesis. It paints the universe as either at first created an infinite mist of unequally distributed elemental atoms; or else as, at stated intervals, becoming such. It sees great movements beginning, or re-beginning, in this unformed but living infinite; centres of growing aggregation; and tendencies towards those centres. It calculates the consequences of these tendencies, and proves that great gyrations must result from them. It shows how the laws of heat will bring about consolidation; and how the laws of motion will effect at first a ring and then a planetary system, in each vortex, throughout infinite space. Thus

stars and suns, nebulae and comets, earths and their satellites, appear upon the scene; each with its proper motions; each destined to work out a different history, according to its circumstances. Then it takes up our solar system, and calculates, and weighs, and keeps perpetual watch upon it. It suspects the existence of an extra member of the system, and by pure dint of numbers finds it. It proves the molecular discreteness of Saturn's rings, and the aqueous character of the envelopes of Jupiter and Mars. It invents the thermo-electric pile, and proves that the sun's spots are not so hot as the rest of its face, and that the body of the moon is as utterly cold as space itself. It invents the spectroscope, and makes out with it five of our metals in the sun, and two of them in Sirius. Then it takes up our earth, and shows how once it more than filled the entire orbit of the moon, first throwing off a ring which became our moon, and finally condensing to its present form, a globe of lava, with a crust of rock, a skin of water, and an envelope of air. It sketches out the story of this crust: how its first flakes emerged and joined, and were re-enforced and thickened from below, compressed, turned up, re-melted and re-formed: how a steady torrent of hot acid waters rained down constantly upon all portions of this forming crust, disintegrating it as fast as it was consolidated, and flying up again in steam, to carry off its heat into surrounding space: how in due course of time the seas became cool enough to retain both their waters and the alkaline and acid sediments which they brought into it: how the chlorates and carbonates of the land changed partners when they reached the sea, and formed the salt which gives it sweetness, and the dolomite which made its ancient bed: and how, as time went on, changing the proportions and relations of terrestrial elements, form after form of life appeared, each suitable to the exact amount of heat or cold, of light or darkness, moisture or drought, acidity or alkalinity of its place of birth, and changing then to something else, or something better, when it could no longer live a life conformable to its own nature; each form superior to the one preceding it; until at last man came, to find a world grown firm enough to live on, cooled to the temperate point, soiled, shaded, lighted, watered properly,

sprinkled with gold and precious stones, inlaid with iron and brass, and floating through what is to him a finished universe.

Have we not here a procession of realities, where before we had a mist of dreams filled with the fantastic gibbering of ghosts? That is just the distinction between the ancient Gnosis, and, in a less degree, all ancient knowledge, and the modern sciences.

Let me now turn your attention to the same strong contrast between ancient and modern thought which the practical *application* of these cosmological views exhibit. I mean the application of the old Gnostic theories to the practice of astrology, and the applications of modern astronomical science to the discovery of the laws of climate, to the practice of navigation, and to the measurement of land, forming what we call the sciences of Physical Geography, Navigation, Geodesy, and Civil Engineering.

The essential element of the contrast still is, that the one is a system of fancy, the other a system of facts. The one exercised habitually a cruel power over the lives of men by its claims to magic; the other blesses mankind, not only with the purest lessons of universal law and order, but with comfort in the house, and safety on the sea.

Take a well-known example from the history of the founding of the Christian Church. In the Acts of the Apostles we read that, at Ephesus, an uproar threatened the best part of its citizens with fire and sword for doubting that the stone, which the worst part worshipped, fell from Jupiter. It would be hard to raise a riot now-a-days, in Washington, by any story our astronomers could tell about the great ring-meteorite which forms the central object of attraction in the Museum of the Smithsonian Institution. Chauncey Wright calculated that five millions of these bodies strike the outer stratum of our atmosphere every day; and that the major part of them, driven by their own or the earth's velocity to various depths in it, are triturated, smelted, evaporated, distributed by the winds, and slowly settle to increase the size of the earth. An occasional larger mass, becoming incandescent only on its outside, throws off a cloud of volatilized matter as it passes through the atmosphere, and then resumes its dark, cold flight through space—space that is full of such. Now

and then one hits the earth in its orbit so fairly that it succeeds in reaching the bottom of the atmosphere, and buries itself in the soil, or in the broad expanse of the ocean. In the old days of astrology men would have built a temple over it, and organized a priesthood for its worship, and regulated politics by its magnetic auguries; but in our days of astronomy, the finder cuts it up into pieces and sells them for five dollars a-piece, to be labelled and stowed away in cabinets with bottled tarantulas, Indian arrow-heads, and coprolites from the chalk.

One perhaps is powwowed over at a meeting of the Meteorological Society, where an interesting paper is read by Mr A. on the observed height, length, direction, velocity, and luminousness of the meteor's flight, as seen from half-a-dozen small villages in different parts of the country; and another piece may form the subject, perhaps, at a meeting of the Chemical Society, of an equally instructive paper by Mr B., showing the probable constitution of the meteor, from a careful analysis of the fragment; disclosing the presence of so much iron, so much nickel, so much schreibersite, with remarkable traces of carbon; suggesting the possible existence of unknown organisms, whether animal or vegetable the author cannot say, upon the planetic body of which this meteor seems to have formed a part. A third perhaps goes over to Vienna, where, at a meeting of the Imperial Academy, the venerable Herr Hoffrath Haidinger draws attention to certain impressions, as it were of human fingers, in the at-one-time plastic mass, but only at one end, and shows that the end so marked must have been the backside of the meteor as it flew, behind which, as in a ship's wake just abaft the rudder-post, an eddy of incandescent air and gases had been formed, reducing the metal to plasticity and leaving upon it these impressions; at the same time he shows how the solid banking up of the air in front of this frightful projectile must have brought its forward career to a sudden stop, when the earth's gravity would take effect and bring it, almost at a right angle, to the ground.

Such are the two different ways in which ancient and modern science would treat the objects of science, showing always the same preponderance of a helpless and therefore fearful fancy on the one side, and of a bold and

powerful criticism on the other. The human race was placed upon the earth at the same disadvantage through ignorance which prevents a traveller from sleeping the first night he spends in a strange inn. The human heart grows timid in the dark, while familiarity with the obscure breeds contempt. The human race regard old heathen terrors now with the same nonchalance with which a family born under its roof hear noises in a haunted house; or rather with that staunch, earnest, watchful intelligence with which an engine-driver walks round and round his well-regulated and thoroughly comprehended, yet tremendous machine.

You will not of course mistake my meaning so far as to imagine that I contrast the ancient and the modern worlds! I am only contrasting the ancient gnosis with modern science. Superstitions of the lowest kind still fill the earth. I speak of the genius of the learned world. The same uncultivated fancy keeps alive in our day, among the uneducated classes and races of men, astrological and all other ancient absurdities. They float daily to us across the Atlantic, like cloud-rack, to be absorbed and made to vanish in the clear, dry intellectual air, which, thank God, we were born to breathe. The education of the world as a whole has hardly yet commenced. It might well strike us with astonishment to see a *well*-educated world fighting for slavery instead of for liberty, reeling with drunkenness, reeking with squalid vice, roaring with obscene profanity, as so much of ours does! No, we are simply considering the contrast between the intellectual condition and habits of the philosophic world as it existed a few thousand years ago, with what its intellectual habits are now; and what is the actual Christian value of the science of nearly the entire population of these Northern States, of Scotland, Switzerland, and Prussia, of the upper classes in England, France, and Italy, and in fact of the wealthy everywhere.

About six months ago a letter, addressed to me in Boston, reached me, I know not by what means, through the Office in Philadelphia. It had been written by some motherly body down in Maine, and enclosed an old one-dollar bill. It gave the hour and minute of the woman's birth, and begged me to return the horoscope in diagram,

with the prediction founded on its figure. And in a touching little postscript, as badly spelled and written as the letter itself, she added the birth-date of her favourite son, and begged me to include his fortune in her own.

Now it is a very curious question: on what principle the notion of the *government of human fortune by the stars* could have been so early, widely, and permanently established. The idea of cause and effect, or of antecedence and consequence, not to go into its metaphysical discussion, seems inherent in intelligence. Even the lower animals exhibit it. The reason why our ponies are alarmed at wheelbarrows and dummy engines is evidently because they cannot comprehend how anything can go unless it be preceded by a horse. They seem to be infected with the same horror of the prodigious which we would tremble under were we to observe St Denis marching off from martyrdom with his head under his arm. Our savage ancestors never became intellectually reconciled to an eclipse of the sun or of the moon because they could suggest no benevolent cause for it; it seemed to them like some deadly swooning of a father or a mother, threatening themselves with orphanage. The worship of the heavenly bodies must have borne exact proportion to the daily and nightly benefits they bestowed upon mankind. At the equator the sun was an enemy, at the poles a friend. The Arab addressed his praises to 'the great rock in a weary land' because it protected him from the solar rays. The Scandinavian, on the contrary, watched the declining sun from June to December with undisguised anxiety, erected slanting dolmens to detect the first certainty of its approaching return; and when assured that its face was once more set towards their habitations, over which their enemy the snow had already begun to heap itself, they dragged the yule log to the hearth, and danced and sang and drank the grand carouse of all the year, making the frozen air resound with their Christmas carols under the mistletoe, long before Christ was born, or a mass had ever been said in honour of the Sun of Righteousness. The celebrated contest between sun-worship and pyramid- or water-worship which characterized a part of the monumental history of Egypt was a conflict of sentiment between the equatorial and the polar zones, the iconoclastic sun-worshippers

coming into the valley of **the** Nile from the mountains of Armenia and the distant steppes of Scythia, at the close of the 14th* dynasty, 2000 years more or less B.C., as they did again under Cambyses about the year 500 B.C., and again, to take permanent possession, as the Turks of the 13th † century of the Christian era, long after the old sun-worship had been exchanged for the rational religion of Mahommed.

In like manner the worship of the moon must have sprung from that dependence on her lovely light which was inevitable in an age of forests, when men had neither lamps nor clocks to live by, and were surrounded by such wild beasts as bows and arrows could do little to offend, lions and tigers, hyænas, auroxen, and the great horned Irish elk, wolves and wild boars, and the immense cave bear, the elephant, and the rhinoceros.

Without the waxing and waning moon man would have taken no account of time; no weeks, no months, nothing but the long cycle of the year. The idea of sequence was bound up with the moon; she became the goddess of order, made story-telling possible, and lovers' assignations, and parliaments. On the worship of the moon the whole Druidic system of law, as well as ceremonial, leaned; and when its canons were abrogated and its usages were suppressed by Christianity, they still continued to exist as popular superstitions. The majority of farmers, to this very day, regulate their planting and felling of timber, their pruning and grafting, by the phases of the moon; while their wives in the kitchen would find all their yarn untwist, and all their soap go back, unless they consulted the almanac.

In one or two instances modern experimental science has actually reinforced the ancient superstitious observance of the moon. It is now well understood that young plants, like human babies, must have plenty of rest. If they shoot

* Mariette (*Aperçu*, &c., 1867) accounts for the lack of monuments of the 15th and 16th dynasties by the invasion of the Hyksos. Bunsen agrees that they came in with the 4th king of the 13th dynasty, but they did not become legitimate sovereigns until the 17th dynasty. See Renan, quoted below at the beginning of the 6th lecture.) The actual solar disc fanatic who did the mischief was *ḫun-aten*, who followed Thutmosis I. of the 17th dynasty, his mother being a foreigner.—*Indigenous Races*, Gliddon, 1857, p. 116.

† The Turkish dynasty of Ottoman sultans commenced in 1258.

up from the seed in the waning of the moon they enjoy the repose of long, dark nights ; if in the growing moon, their young life, over-stimulated, perishes, or suffers deterioration more or less. The latest observations make it certain that the sun-heat reflected from the full-moon's face is sufficient to dispel clouds, and it must modify, therefore, notably the climate of the kitchen-garden. One of the most brilliant astronomical discoveries of the last ten years is that of the so-called Eleven-Year Cycle, during which Jupiter and the other planets alternately collect upon one side of the sun, and then at other times disperse themselves around it ; producing, in the one case, an abundant supply of spots upon the sun's disc, with a corresponding lowering of the climate of the earth ; and, in the other case, the dispersion and disappearance of spots, and a higher mean temperature for the earth.

These are merely instances showing how the instinct of man may sometimes anticipate the final deductions of his reasoning faculties ; and we are thus taught to *despise nothing*, not even the follies of superstition.

Still less ought we to despise the ancient worships of the sun and moon, inasmuch as our own notorious irreligion is due to an insensibility to the benefits which we receive all the time and on all sides from Nature, caused by our modern mastership of Nature. The slave-holder feels no gratitude to his slave ; the magician cannot worship the devils who do his bidding ; therefore I have always thought that the poet only showed his ignorance of human nature and of the tendencies of natural science, when he wrote—'The undevout astronomer is mad !' Ignorance has always been the mother of devotion. The man who can hold the solar system in his fist, and measure and weigh it with his scale and compasses, and predict with accurate certainty what its changed aspect will be a hundred thousand years beyond the term of his own appointed career upon the earth—this man may worship his wife, his emperor, his country's flag, his science, justice and honour, and the Great God of the invisible universe ; but certainly not any heavenly object, nor even God on account of the mere wonders of His sky.


But in old times it was not so. The procession of planets went on to and fro with the mystery and grandeur of a

procession of priests; and was so worshipped. The mysterious pole-star was the savage man's best friend, and the sailor's also. The dog-star, rising as the sun went down, just when the blessed inundation of the Nile promised a harvest for the coming year, came in of course for a large share of Egyptian love and reverence. Shepherds of Persia and Arabia had nothing else to do, whole nights, whole years, whole lifetimes, but to watch and wonder at the many-coloured, slowly-shifting stars. They saw the satellites of Jupiter without a telescope; and by dividing up a few hundred revolutions of each satellite by the number of nights of observation, they could arrive at its rate of motion to a minute of time. The strange diversity of names given to the constellations, the utter absence of any harmonious system in the zodiac or out of it, the purely fanciful and oftentimes inexplicable groupings of the principal stars, all go to show how many minds in how many ages helped the old astrology to assume the shape in which we know it now.

Comets were a terror to the ancients because their shape suggested war, and their flaming glare pestilence, rushing through the sky like warriors with dishevelled hair, and always at some epoch of convulsion, either during the invasion of some bloody conqueror, or at the death of some great leader. Volcanoes were, for the same reason, or rather by the construction of the same uninstructed fancy, made the abodes of malignant deities, personifications of those forces of nature not yet subjugated by man's intellect. High mountain-peaks, the inaccessible thrones of ice and snow, sources of thunder and lightning, avalanches, and devastating floods, became the homes of other gods, the enemies rather than the friends of man. But, above all, the all-devouring ocean inspired terror in the human breast, and this terror generated some of the widest-spread superstitions connected with the ancient mythologies. Serpent-worship and Siva-worship and devil-worship in general can be distinctly traced to it, as I will show in a future lecture. The ship which carried man, and the stars which guided him across the trackless sea, became personified into his favouring* deities, and

* 'If, most venerable man! it is a disgrace and sin to forget God, it is also a stain upon the virtue, and a dishonour upon the judgment, of


thus astrology linked itself with physical geography, as astronomy has done in our day to much better purpose.

Let me touch, in passing, upon the curious etymology of the word 'star.' It is supposed to be explained by a Sanscrit root signifying *to stand*, in Latin *stare*, alluding, of course, to the immovable positions of the stars. But the use of the star-shaped diagram in astrology suggests another idea. The word for mountain is *TOR*, expressed in writing by a triangle, our letter *D*, the Greek Δ .* The symbolic star with six points (for the heraldic star with five points is not a star at all, but a mullet or spur), was made by crossing two triangles , and called the Sacred Tor, *sTOR*, and was used thus, abundantly, by the magicians and cabbalists as the background or framework of their horoscopes. It seems to be one of those numerous implantations of a later astrological mythology upon an older pyramid or mountain-worship with which I should be loth just now to interrupt the subject of this lecture.

Confining our attention to the group of sciences to which this lecture is devoted, it is plainly to be seen that their utterly embryonic condition in ancient times, and the abstract and cosmical character which they bear, make it unlikely that we can get from them many concrete facts respecting the earliest times of man.


I will begin with the science of Numbers. From what we know of the notation of savage tribes of the present day, we may infer with great certainty some of the intellectual conditions of man's earliest residence upon the planet. I leave to the next lecture the question how long man has lived upon the earth. I take for granted also this evening that his first appearance was in an undeveloped condition of mind. The ideas of number which savages of the present day possess are strangely limited: some of the lowest tribes cannot count above three; the Australians







any one, who has virtue and judgment, not to reverence you, who are a very target of wonders, into which the stars, contending in your favour, have shot all the arrows of their gifts.'—Letter of Arretino to Michael Angelo, in Perkins' *Tuscan Sculptors*, vol. ii. p. 50.

* See Rawlinson's picture of the hill Koukab ('the star') in his *Babylon* (about page 140). See also the fact that *sb*, a star  means not only to *adore*, but a *gate* (or *door*). Bunsen, p. 537, *Egypt*, vol. i., 7th determinative.

count only to four, and after that all numbers are to them merely *Kauwol-Kauwol*, 'many,' or *Bungu Galang*, 'very many.' Many stop at five; others count up to ten before they begin again. The Sioux Indians, Dr Hayden tells me, count upon their ten fingers and their ten toes, and call that one man; their first unit is therefore one, and their second unit is twenty. Pliny Chase has discussed this curious subject with great skill, to develop the fundamental ideas of the numbers on the basis of the names which are given to them in many languages. He finds that their very names show how feeble the mathematical faculty of the savage must be. In some of these wild languages even the word for three means two and one; four means twice two; five, three and two; six and eight mean the second three or the second four, &c.

Imagine, if you can, the barrier to mental development which such an embryonic notation must be. Think of the difference between making nine strokes, as the old Egyptian had to do, and writing our Arabic numeral 9. Progress in mathematical machinery was at first very slow; yet our cypher 8 is merely a more convenient form of the old

Egyptian  In some respects their notation seems

simpler than ours, as when they represented 10 by , 100 by , 1000 by , 10,000 by , 1,000,000 by , and 1,000,000,000,000,000,000 by .

But it was not really so; for nothing can excel the utility and simplicity of our decimal system, unless it be a similar system with a decimal of 8, or 12, or 16, instead of 10. Any advance in true physical science was impossible in early times merely for want of some such counting machine. The first ages of humanity were devoted to darkness because all numbers beyond a score or a hundred were alike uncountable. In fact, there is a natural dislike to mathematics in the untutored mind; it brings too great a strain upon the intellect. You remember the Arab Sheik's reply to Layard's friend:—'Although I have passed all my days in this place, I have neither counted the houses, nor inquired into the number of the inhabitants. Shall we say,

Behold this star spinneth round that star, and this other star with a tail goeth and cometh in so many years? Let it go! God will guide it.' This of itself is sufficient to explain the reckless chronologies of early days, and the unblushing coolness with which thousands of years were lavished on the reigns (or life-times) of half-a-dozen generations.

And yet, the occurrence of those immense numbers at the beginning of the Egyptian and Indian history hints to us the existence of some profound consciousness of an immense preceding antiquity residing in the ancient mind. The old bards were aware that the race had been tens of thousands of years upon the earth from considerations of architecture and traditions, now lost, just as we have been made aware of it by considerations of a geological nature. Hence it was natural for them to make a rude calculation of the precession of the equinoxes and fix the date of the beginning of the Egyptian empire at 35,000 years.

Now it is in taking up such rude calculations of the ancients and making them more precise, and applying them with a cultivated common sense, that modern Mathematics and Astronomy find a chance to employ themselves about the question of the original conditions of our race. The discussions over the zodiac of Denderah, although they resulted in proving it to be a mere astrological diagram of no astronomical value whatever, and therefore useless to the historian, were still of use in opening up other and more fruitful resources. The fables of antiquity are often good ethnological guides, and some of these come within challenge of this mathematic group of sciences.

Take for an example one of Kepler's most happy hits. It is rather too modern an instance, for it relates to an event dating less than 2000 years back. But it is a fine illustration of the treatment which the modern sciences are prepared to give to any ancient record that may be brought under their notice. Kepler was engaged in calculating backwards the orbits of our two largest planets, Saturn and Jupiter, when, to his astonishment and great delight, he saw that one of their conjunctions, and one of the very closest and most splendid that they had ever had, happened, under the most favourable circumstances for seeing it, precisely at the birth of Christ as given in

the books. Of course the legend of the star in the East was at once explained in its most essential features.

In like manner, taking an example a few centuries farther back, the recalculation of the eclipse of Thales has become the starting-point of the chronologists in their rectification of the old Greek tables.

Going back much farther, some of the most important Egyptian dates have been obtained by calculating the heliacal rising of Sirius and other stars watched by the Egyptians on account of their connection with that vitally interesting event to them, the beginning inundation of the Nile. Much of that old mythology receives an easy explanation in this way.

I have just alluded to the use made of the precession of the equinoxes. A similar use is made of the ellipticity of the earth's orbit. A discussion is going on (at present) respecting the effect upon old climates which a regular variation in the shape of the orbit of the earth must have produced. Laplace calculated the maximum and minimum of this ellipticity, and commenced the calculation of the length of time required to lengthen it out to its longest, and then to reduce it to its roundest form. The subject has been taken up lately by others to show that while the corrected mean distance of the earth from the sun is just now about 93 millions of miles, there must have occurred, at enormous intervals of time, periodically, such elongations and contractions of the orbit as to bring the earth during one season of the year within 85 millions of miles of the sun, and during another part of the year to carry it off 105 millions. This extreme ellipticity, however, must take place in a different direction each time, so that the closeness of the earth to the sun will sometimes coincide with the summer of the northern hemisphere and sometimes with its winter. When it coincides with summer, then the northern hemisphere must suffer the most extraordinary variations of temperature, the absolute extremes of both summer and winter, during which it is hard to see how human life could be successfully preserved upon the earth. Such was the glacial epoch—all the glacial epochs. On the other hand, when the earth recedes farthest during summer, and approaches nearest during winter in the northern hemisphere the amount of

heat received from day to day from the sun must be almost invariable round the whole year. Then reigns perennial spring. Then animal and vegetable life holds its millennial holiday. Such was the carboniferous era—all the carboniferous eras.

I did not mean this evening to touch upon the geological antiquity of man, reserving that for the next lecture, but you will see at once that this astronomical question of the ellipticity of the earth's orbit bears directly and heavily upon the date of man's origin. If the last maximum ellipticity happened, say 100,000 years ago, causing the last glacialism of the northern hemisphere, and if we can find any facts connecting that glacial condition of the earth with the remains of man, then the conclusions so derived must influence other lines of inquiry. And yet it is but one very little streak of light, mere candle-light, which astronomy throws in among the shadows of those Robin Hood and Robinson Crusoe days of mankind.

2. Another such glimmer of poor information is furnished by Physical Geography, the marvellously zealous and productive pursuit of which, within the present century bears to the geography of the ancients about the same proportions which the results of modern astronomy bear to the dreams of ancient astrology. To feel the full force of this comparison you need only lay upon your table the poor little sketch-map of Ptolemy; then spread abroad upon your floor the sheets of the Swiss, French, Swedish, or British topographical surveys. In the former all is monstrous and confused, not a latitude or longitude correct; not a line or part of a line in any portion of it representative of truth; the small is large, the large is small; and fancy fills up spaces where the scanty and untrustworthy reports of travellers have failed. In the latter every mountain-peak is established by a reference to some measured base line; every stream is traced with compass and level up to its tiny rivulets; every man's possessions are defined as if the entire map was but a recorded deed of purchase; his house, his garden, even the footpath which has at its stile the warning sign-board 'beware of spring-guns' is laid down. Four miles beyond the walls of the city of Bourges the geographers of France have erected a pyramidal monument which marks, with true French

idealism but with French mathematical accuracy, the precise centre of France as it was before the annexation of Nice and Savoy. At every mile along the southern boundary of Pennsylvania, Mason and Dixon planted pillars of stone which still remain. On the top of Mount Desert, Wachusett, the Blue Hill in Milton, and a thousand other eminences along the Atlantic seaboard, stand the remains of the heliotropes of Hassler, Bache, and Borden, their relative positions determined by hundreds of thousands of observations, to the fraction of a linear foot.* Russia and India are being mapped with the same accuracy and particularity. Even the hideous deserts of Asia, and the hitherto inaccessible interior table-lands of Africa, are falling into shape under the analytical studies which Murchison and the men of the London Royal Geographical Society are incessantly making from the itineraries and sketches and astronomical observations of Mann and Livingstone, Burton and Speke, and Grant and Barr, and the brothers Schlagintweit, and a hundred other daring explorers, too many of whom have already paid the forfeit of their enthusiasm with their lives.

We look in vain for any analogue of this accurate science in ancient days.

It is true, Col. Vyse, Mr Turner, and the Astronomer Royal of Scotland, Mr Piazzi Smyth, have published the most remarkable things concerning the great pyramid of Cheops. For, according to them, it must have been laid out, not by Benjamin Franklin's great-grandson, but by his great-grandfather 250 generations removed. They find its base to be a precise aliquot part of the circumference of the earth. They find all its proportions to be geometrical and astronomical. The angle of its sides, the slope of its galleries, the distances from chamber to chamber within it they show to be obtainable by compass and scale. The granite chest in its central chamber they say is no sarcophagus : it is a vast standard bushel, containing

* Eight hundred counties in the Northern States have been mapped so as to show every house and the owner's name; and a complete set of these maps is preserved in the Library of the British Museum.

The whole valley of the Mississippi has been crossbarred by the surveyors of the government of the United States at intervals of six miles, north and south, east and west.

precisely four English quarters of corn. And, more than all, they think they prove that the builders of this gigantic *meter for all time* must have come from a distance (perhaps from Mesopotamia) in search of some such place as Memphis, where the relations of latitude could come harmoniously in among the other geometrical relationships which were to be made constants for all science, in this pyramid.*

However true all this may be, it goes but a short distance towards our purpose. It is certainly equally true that no practical applications of such sequence, if it really existed, was ever made in ancient times on any scale deserving of mention by a modern man. The maps which ancient Hindu and Chinese books contain are caricatures. The oceans, as we know them, were to the ancients a river coiled seven times round the entire world inhabited by man; or, at best, a rim of water round an island continent, up from which, and down again into which, the sun and heavenly systems rose and sank from day to day. A few grand thinkers had indeed concluded that the earth was not a circular plate, but a globe hung in space: but nothing came of this conjecture but that which was in its turn conjecture. The Chinese early knew the magnetic needle; but not how to work out their geography with it, in combination with the telescope and spirit-level. Each traveller had a different story to tell: the geographer was bewildered with their contradictory reports. The skein could never be unravelled because the beginning of it could not be found; for the *sine qua non* of modern topography is a measured base to start with, and the ancients were not up to that, although their Euclid is our God of Cambridge. But Euclid is one of the moderns.

It is a very great pity that the ancient world has left us no records of physical geography to compare with our own observations. Had we correct hypsometrical tables of the heights of the Alps as they were 5000 years ago, what light that would throw, not only upon the rate and amount of the submergence or emergence of the European Conti-

* The beautiful application of physical science, in the double shape of the magnesium light and the sensitive photographic plate to the elucidation of the ancient mysteries of the chambers and galleries of the great pyramid should not be passed unnoticed.

ment, but upon the migrations of its early inhabitants. Eight centuries ago, for instance, those dangerous passes in the Alps, which the traveller now can hardly find a guide to pilot him through, were common highroads of communication between the Swiss and the Italian villages. A succession of cold seasons lengthens all the Swiss glaciers sensibly, and increases the privations of the mountaineers. There was a time when the isolated glaciers of the Alps formed one; covered the whole watershed; spread its edges over the low lands, filled up the lakes, banked against the Jura, and probably connected themselves with vast sheets of ice and snow around the world, to the detriment, if not to an almost complete destruction, of sections of the human race. The science of Meteorology has much to teach us on this subject. Then there are all the questions of climate connecting themselves with the rise of mountains, the formation of new sea-currents by fresh volcanic submarine obstructions, and the spread and disappearance of great forests, all of them determining some fresh investigation into the earlier state of man both in historic and in pre-historic times.

What we most miss and need are ancient records of these physical changes.

Had we even a rough outline of the delta of the Nile made no farther back than the twelfth dynasty of the pyramid-builders, how much nearer we could come to the answer of that vexed question whether Egypt was settled from Asia or from Africa; whether the black man or the white man be the elder brother. If the Rig-Veda, instead of being a jumble of ceremonial hymns to fire and water, were a single tolerably well-constructed map of the valley of the Ganges, and the country behind the Sunderbunds, how much vain argument respecting the value of the Yug chronology and the antiquity of the Turanian tribes of the Ghauts and Deccan would have been saved! All science to become efficient must become comparative; this is its second stage. To settle the earliest history we need the combined efforts of comparative geography, comparative zoology, and comparative philology. But comparative geography, or, as we usually call it, Physical Geography, which, after describing the present status of the earth's features, argues back to what they have been, and seeks

out both the laws which governed the change, and the effects which it produced upon living beings, especially on man—Comparative Geography is, after all, only one phase of Geology. I will therefore close this lecture here, and promise to take up in the course of the next the points which have been just suggested.

I shall discuss the Geological Antiquity of Man, as proved by his fossil remains, in connection with the relics of extinct animals; the proofs we have of great geographical changes during the human period; the value of various scales of years which geologists have endeavoured to apply to the residence of man upon the earth, and the ground of the now commonly accepted division of antiquity into three definite periods—the Stone Age, the Bronze Age, and the Iron Age. And I shall endeavour to make these *questions* clear by diagrams to the eye, although I may not be able to make their *answers* wholly convincing to the judgment of my audience.

LECTURE III.

THE GEOLOGICAL ANTIQUITY OF MAN.

THE antiquity of mankind,—the dignity of mankind,—the unity of mankind :—these are the three great preliminary questions of ancient history. Three separate sciences take charge of them. The antiquity of mankind is a geological problem. The dignity of mankind in the scale of nature is to be chiefly decided by zoology, or comparative anatomy. The moot question of the unity or diversity of the race begins the studies of the ethnologist.

All three questions have been settled for us, as you are probably but too well aware, many centuries ago by that 'science falsely so called' Theology. And it really seems to be a work of clear supererogation to commence the investigation again. Are we not *assured* that the world is only about 6000 years old? That man was made on the sixth day of its existence? Does it not stand so written in the books of Moses? Do we not also *know* that man was created upright before he fell, and of a grade but little lower than the angels; and that his spirit goeth upwards, while that of the beast goeth downwards? All this is too distinctly written by holy men of old, who wrote as they were moved by the Holy Ghost, to be called in question for a moment. Even the smallest particulars are put at the service of our curiosity to be received with implicit faith :—how that God made one Adam first; then cast him into sleep, took from his side a rib and made a woman of it, and how, from these twain, sprang all nations and peoples and kindreds and tongues that dwell upon the surface of the whole earth, white and black, yellow and brown, dwarfish Esquimaux and gigantic Patagonians, woolly-haired Melanesians and beautiful Greeks, Jews with great noses and Chinese with cat-like eyes, upon every con-

continent and in every remote island of the sea. The books of Moses are believed to inform us absolutely of these facts, in language as unmistakably plain as we could desire to have it; as plainly, in fact, as they inform us that the earth was made three days before the sun, thus settling for us the nebular hypothesis, and various other little difficulties of an astronomical nature which arise out of the rotation of the earth and planets according to the Copernican system.

It is surprising how indifferent men of science seem to be to these great statements! Thousands of preachers proclaim them from the pulpit every Sunday in the year; and millions of communicants respond—Amen! And yet our men of science continue sceptical, and call them, as the apostles did, old-wives' fables. They believe them indeed to be old Jew-legends so palpably heathenish and contrary to all we now know that it is not worth while to try to show their absurdity. But they add, more seriously, that these old fables are no part of Christian theology; that they have been foisted into the body of Christian divinity to save the brains of the silly, to sustain the prestige of the clergy and to excuse the vices of the laity; and that they are already disappearing from the public faith so fast under the influence of public school-education that no especial notice need any more be taken of them. It is a noteworthy fact that the books which periodically appear in the shops upon the Harmony of Science and Religion, or upon the Relations of Genesis to Geology, are written by clergymen; and all of them in the service of Jewish theology. All alike, men of science will no longer even read them, but look with as despairing an eye upon those who write them as Christiana's party did upon the man whom they found asleep upon the enchanted ground.

'And that place was all grown over with briars and thorns, excepting here and there where was an enchanted arbour, upon which if a man sits, or in which if a man sleeps, it is a question, some say, whether ever he shall rise or wake again in this world. Over this forest therefore they went, both one and another, and Mr Greatheart went

before, for that he was the guide; and Mr Valiant-for-Truth came behind, being rear-guard. Now they had not gone far, but a great mist and darkness fell upon them all. Wherefore they were forced for some time to feel for one another by words, for they walked not by sight. But any one must think that here was but sorry going for the best of them all; but how much worse for the women and children who both of feet and heart were but tender. They went on till they came to where there was an arbour, wherein lay two men whose names were Heedless and Too-bold. Then the guide did shake them, and do what he could to disturb them. Then said one of them, I will pay you when I take my money. At which the guide shook his head. I will fight so long as I can hold the sword in my hand, said the other. At that one of the children laughed.'

Through this enchanted land men of science have learned to hurry on, without any longer even making such benevolent but futile efforts to awaken the sleepers in its arbours.

Let us start fair this evening with the discussion of the first of the three problems which I have mentioned, viz. the geological antiquity of man. To do this we must make up our minds to part company with the schoolmen. There is no alliance possible between Jewish Theology and Modern Science. They are irreconcilable enemies. Geology in its present advancement cannot be brought more easily into harmony with the Mosaic cosmogony than with the Gnostic, the Vedic, or the Scandinavian. It has escaped fully and finally from its subjection to the Creed. Sindbad has made the little red man of the sea, who sat so long on his shoulders, tipsy with new wine, tossed him to the ground, and crushed his wicked old head with a stone. Sindbad is free. Geologists have won the right to be Christians without first becoming Jews.

The arguments for any geological fact which is at all a comprehensive one are gathered only by years of patient and laborious observation, not in the closet, but in the field, the cabinet and the laboratory. A thousand fruitless journeys before success can crown the search! A thousand false hypotheses before the true theory is established! A thousand mistakes of observation published before they can get corrected! Consequently the literature of the

science is something enormous and appalling. Every new step in advance, while it becomes in one sense easier, in another sense becomes more difficult to make. Outsiders, charlatans, tyros, sciolists, have no chance at all. They must take everything on testimony. There was a time when the Dean of Westminster in his study could be a tolerable geologist. That time is past. No man who does not go out and grapple with nature, wrestling with this angel through the long dark night, receives the blessing when the sun is up. The knight who will take initiation into these mysteries must make his vigil on the floor of the great church, equipped in full armour, fasting and alone, chaste, silent, brave. It is impossible for a mere reader of Lyell's Elements, or a mere listener to Sedgewick's lectures, to get that profound faith, that overpowering conviction of the reality of former creations, and of their incalculably great antiquity which is as natural to the working field-hand in palæontology as is his faith in the good God or in his own past life. If I speak therefore dogmatically to-night, you will understand that the great first truths of Geology have been so seen and touched and tasted, that they are no longer speculations, but experiences; no longer objects of belief, but of absolute knowledge. Geology is *not* in its infancy; it has reached a ripe maturity. Its greater truths need no further testimony, no more copious illustration than they already have. And it is only of such that I will just now speak. Doubtful things will come up afterwards.

Before touching the antiquity of man, I must give you a clear conception of the immense antiquity of the earth.

If you see a stone house a-building, you know that the foundation walls were built first, and that the cut courses must have been laid in an ascending order. You know this with absolute certainty. The most direct outside revelation from God could not make it plainer, nor add to the force of your conviction. Nor could the worker of a thousand miracles before your eyes shake this conviction for an instant. Now Geology is the science of this conviction applied to the crust of the earth, as an unfinished building of stone, the courses of which have been laid in successive days. It has its Metamorphic foundations, its Palæozoic surbase story, its stately superstructure of Se-

condary and Tertiary rocks, and its Volcanic pinnacles. The workmen with their tools are still upon its highest scaffolding. The forms of Lapithæ and Centaurs fill all the metopes of its entablature. The pediment is even now receiving its Olympic synod in low and high relief. Created 6000 years ago, and in a single day! You might as well affirm that Cöln cathedral was begun and finished before breakfast yesterday. You might as well believe that other oriental story of Aladdin's palace.

Three points claim especial attention. The first point is the characteristic geological feature of *superposition*. The waters of the globe have been spreading one layer of sand and gravel over another, one layer of mud over another, one layer of limestone and marl over another, without intermission, without haste, with the greatest regularity, for many millions of years, until the whole thickness of such aqueous sediments as are known to us, amounts to no less than 16,000 fathoms, say 20 miles, from top to bottom. And when we remember that what we call the bottom of these sediments is no true bottom layer, but merely the lowest limit of our observations thus far reached, we feel ourselves at liberty to carry back the era of commencement to an indefinite distance.

The next point to be insisted upon is the division of the time represented by this 20 miles of sediment into four or five successive ages; and the subdivision of each of these ages into successive systems; each system into successive formations; each formation into successive beds; and each bed into laminæ or fine layers, no thicker in some cases than a sheet of foreign letter-paper. All these different ages are as well characterized by distinctive features as the ages of architecture are by different styles. No traveller thinks of disputing with a local archæologist while he is showing him the curiosities and beauties of a cathedral or abbey church, founded in one century, enlarged in another, partially rebuilt in another, and restored and beautified in his own day. There is no mistaking the Roman age of the towers of Junièges, nor the Norman age of its roofless nave, nor the later date of its ruined pointed Gothic choir. A glance is sufficient to decide that the façade of the Chateau de Galliou could not have been designed by any architect who lived when the baths of

Nero were put up. So a glance from the stage-coach is sufficient for the experienced geologist to tell whether he be riding through an old Laurentian or Huronian region, or among Palæozoic mountains, or over the later estuary sands of the New Red, or over the still more modern plains of the Chalk and Greensand formations. And this characterization of sediments of different ages is carried out in nature so completely, and to such minuteness of detail, that the good local geologist can recognize, by the very surface soil and incidental shapings of the hill-sides, upon what particular belt of one formation he is riding, whether the rocks around him belong, for instance, to the Upper coal measures, or to the Lower; to the upper, the middle, or the lower Silurian. You can easily imagine what an impression of *time* this makes upon the thoughtful mind.

The Hebrew legend of the creation describes the separation of the waters from the dry land as having been determined by a creative act upon the third day, and fixed for all time. The fact is, that no *fixed* relation of land and water has ever been established for the surface of the globe. From the beginning land and water have been exchanging places. Every acre of the land-surface of the earth which geology has examined bears indubitable marks of having been not simply overflowed, but actually created at the bottom of the ocean. And it is needless for me to tell this audience what proofs we have that every part of every coast of every ocean is, this evening, while I say it, either rising slowly from the waters, or sinking slowly into them. Can any phenomenon enhance more highly than this our ideas of geological time? Yet when we come to feel the full force of the terms Erosion, Denudation, as applied to the present surface of the earth, by which, through the slow wear and tear of centuries—millenniums—of fiery summer suns and wintry frosts, sedate glaciers and mad torrents, trickling rills and mouldering damps, sharp rootlets thrust in cracks and lichens softening the toughest rock, the very Alps have been wasted half away, and where once even mightier Alpine ranges ran, now nothing but a continent of rounded, grassy, forest-covered hills remains;—still more, were I to give you proofs at hand of the repetition of this work in all the past ages of the world, and show you the wasted outlines of hills and valleys in the inside of the crust itself,

fossil erosions, hills and valleys embedded like bones and shells under whole formations of rock sediment,—you would begin to feel the overwhelming weight of geological time, and be disposed to cry—'Tis but another name for an eternity.

I might illustrate this subject of erosion by many beautiful instances,—such as ravines a thousand feet deep through prismatic lava fields; caves which were once but one, now separated by a river with cliff walls; fissures filled with what was once rock-oil, afterwards dried into a vein of bituminous coal, and now exposed to view on both sides of a wide deep valley. If anything has taken time it has been this mouldering down of the successive surfaces of the planet.

The third point of prime importance is one that brings us close to the subject of our lecture. Every geological age has had its own different and special inhabitants,—its successive creations of life-forms. Each geological system, even each successive formation, has entombed the remains of millions of zoophytes, plants and animals peculiar to that particular stage of the earth's history, and to no other. I say nothing now of any supposed progression of ideas in the creative intelligence embodied in these forms: this would come in better shape before us in the next lecture. I argue nothing here for or against the theory of instantaneous creation; or the opposite theory of spontaneous development of one set of forms out of another. I wish to confine your attention just now to the established fact that no geologist can possibly mistake Silurian rocks for Devonian, or Devonian for Permian, or Permian for Cretaceous, or Cretaceous for Postpleiocene, when he has once caught sight of even only a small collection of their fossils. Nature is no Brummagem manufacturer of old Greek coins or Pharaonic scarabæi to be re-sold to travellers at the foot of the Pyramids, or in the great hall at Carnac. In fact, as if to prevent the possibility of such deception, the truth-loving Creator has marked shells of similar shapes,* but of different ages, with such delicate but unmistakable variations of detail, that we must stand more and more amazed, not only at the infinite resources, but

* E.g. the microscopic dentation discovered by Agassiz in the interior lamellæ of one of two shells in all outward respects undistinguishable.

at the inflexible integrity of his skill. Surely he designed that men should not deceive themselves.

Do you not see what a mistake was made by the fine old Hebrew poet who sang the Mosaic song when he separated the creation of the land and waters from the creation of the fish and air-breathing animals, fixing the former on the third day, and the latter on the fifth and sixth? But let us do him justice. His is a poem, not a text-book. He could only see the phenomena of the world in the twilight of his times; but his genius grasped them, even thus half seen, in a poetic order wonderfully like the actual. Nor was it possible for him to describe them complicated as they are in nature. With the same ample grandeur, but without the horrors that surround the circular stages of Dante's Hell, he has resumed under seven heads the wonders of the universe; and the order of ascending worth which they bore in his own mind tallied with that which in the Divine idea compelled the successive stages of development in the history of the earth.

Conceive now the illimitable stretch of ages upon ages occupied in the production, establishment, increase, decline, extinction, and substitution of these grand ranges of successive worlds of vegetable and animal organisms, all perfect in themselves, all differing from one another, all harmonizing with the growing physics of the planet, and leading slowly but surely up to man. Could God have made all this at once? I speak not of a puckish, brutal Demiurge, fond of such practical jokes; he could. I speak of the Christian's God of truth, the loving 'Father who is in heaven.' Would it not have been a flagrant imposition upon intelligence,—a complicated and most flagitious forgery? Heaven could scarcely have devised such a barmecide feast to set before the hungry intellect of man.

Nor is the difficulty diminished by calling a day a thousand *years*. We have in palæontology the records of a thousand *ages*. Many of the old limestone strata are entirely made up of corals and their triturated *débris*. Some of the old Devonian mud-rocks are mere masses of the casts of brachiopods, of every size from the youngest to the oldest. Some of the coal-measure shales are leaved

like a book, and every leaf glistens with delicate fresh-water shells. In the Deep-river basin of North Carolina millions of fish-teeth lie packed away between two layers of coal which lie but two feet apart. There are more than a hundred beds of coal in a single coal-system, each of which is the result of the growth of a peat-bog, swamp, and forest of a separate age; to say nothing of the many fathoms of rocks which intervene between each one coal-bed and the next in order over it; during which long interval of time the land must have been too deep beneath the water level to permit of vegetation.* The fossil dung of the fish which swam the seas during the deposition of the chalk of England was so abundant that the farmers about Cambridge collect it, as it is set free from the mother-rock by denudation, and use it to manure their lands.

Professor Heer, of Zurich, has lately published in his admirable *Geology of Switzerland* a minute history of one single formation, only 36 feet thick, which he divides into 18 beds. It tells a striking story of change and time, which we need only multiply by thousands to get some adequate notion of the antiquity of the earth.

Until about 30 years ago the great geological question for those who busied themselves with the higher problems of life was this: Why do not the remains of man appear among the fossil treasures of the earth? Here the theologians always had the geologists upon the hip. If the earth is so old, they triumphantly clamoured, why does not man share in its antiquity? Show us a fossil human bone—a fragment of his skull; a single tooth will satisfy us, if it be imbedded fairly in one of your fossiliferous rocks.

To this there was but one reply: Wait!

The ethnologists, the archaeologists, the egyptologists were in the same predicament, and shared to some extent in the embarrassment of the palæontologists. They had

* There are reasons, in my opinion, to believe that many of the intervals, where they consist of sand, were rather raised above than lowered into the water. The calamites, rooted at different heights in the sandy strata of the Glass Bay coast of Cape Breton, seem to argue in that direction. Either emergence or submergence would necessarily put a stop to a coal-bed's growth. Probably both explanations are equally admissible in their proper places.

found human skeletons in ancient caves, mixed with bones of animals, some of them foreign to the countries in which the caves existed. But there was no date to be assigned with any certainty to these ossuary deposits; there was no proof positive that they were not swept into these caves by comparatively modern freshets. It was easy to assert, and hard to disprove, that the caves were not the habitations or at all events places of refuge for the early races of mankind, and that these fed upon the animals whose bones were mixed with their own skeletons; or, on the other hand, the caves might have been the dens of hyenas whose bones were found in some of them in great numbers; and it was reasonable to suppose that these predatory creatures might have added human victims to the other evidences of their omnivorous rapacity. The whole phenomenon was one of such complexity and difficulty that it required a long examination. These caves were discovered one by one in England, in France, in Sicily, in Brazil, in fact in all countries which contain limestone regions. They are very numerous; they differ much in the number, kind, proportion, and condition of their fossils; but they almost all agree in one principal feature—their bones are preserved from atmospheric decomposition by deposits of carbonate of lime, slowly introduced by the infiltration of waters through their roofs, forming stalactites above, and a floor of stalagmite which covers a red earth in which the bones are buried. The *bones of man* were rare compared with those of other animals; but, on the other hand, the instances of the discovery of marks of the *presence of man* were numerous, and the number of stone and flint implements collected from all the caves was very great. Yet it is not too strong an affirmation, that after all the researches of Buckland and Lyell, and Tournal and Schmerling, no one was satisfied how the thing would turn out; what the age of the caves, or of their contents, might be; or what relation the human relics really might bear to the remains of animals with which they were intermixed, or to the geological sequence of aqueous formations constituting the crust of the earth. The individual explorers had their own opinions, but the world of science watching their labours was not satisfied.

Buckland published his *Reliquiæ Diluvianæ* in 1823, in which he discussed the whole subject of organic forms

found in the caves, the fissures, and the gravel-beds of England, and concluded that the human remains which he had found therein were *not* so old as the accompanying fossils. It was a *theological* conclusion, and was accepted with delight by the conservative science of England. Indeed, it remained a shibboleth of geological orthodoxy in England *until about twenty years ago*,* when the acceptance of a new series of discovered facts on the Continent broke down the bigotry of the British school, and a general stampede of the younger geologists took place to the other side of the question.

In 1828, that is, five years after the appearance of Buckland's book, two French gentlemen in the south of France, MM. Tournal and Christy, examined and reported on †bone caves at Bize, and at Pondres near Nismes, in the Valley of the Gard. They had found human bones and teeth, fragments of pottery in two styles, pointed bones and flint hatchets and arrow-heads, cemented in a mud breccia *with living land shells*, and the remains of *both recent and extinct animals*, such as the hyena, rhinoceros, stag, antelope, goat, Lithuanian aurochs and Lapland reindeer, the last of which is almost everywhere found associated with the mammoth of France in ancient alluviums and cavern muds. These gentlemen also thought they perceived unmistakable evidences of a time arrangement or stratification of the remains such as quite set aside the idea that the human relics were introduced subsequently.‡

But there were Bucklandites in France also. M. Desnoyers pointed to the *Druid tumuli* and dolmens of the primitive inhabitants of Gaul, under which he had found quantities of such flint hatchets and arrow-heads, pointed bones and coarse pottery, mingled with the sacri-

* Although Priest M'Enery had early found flint tools under stalagmite in Kent's Hole, near Torquay; and Godwin Austen had published in Trans. Geol. Soc. (vi. 1842) flints widely distributed in loam under the Kent's Hole stalagmite. In 1858 the new Brixham Cave was examined by the Royal Society, and made Prestwich and Falconer antediluvianists.

† Annales de Chimie et de Physique, p. 161, 1833, Christol. Notice sur les ossements humains des cavernes du Gard. Montpellier, 1829.

‡ Lyell, Antiq. of Man, chap. iv. 1863.

ficial bones of deer, sheep, dogs, wild boars, oxen, and horses; but no elephant, rhinoceros, hyena, tiger, or other extinct species found in caves had ever shown that these aboriginal Celts had been their contemporaries.*

In 1833 appeared the great work † of Dr Schmerling of Liège, in Belgium, who had been devoting several years to the exploration of forty caverns in the valleys of the river Meuse, the stalagmite floors of which had never before been broken up. Here, mingled indiscriminately with extinct bear, hyena, elephant, and rhinoceros, and modern beaver, cat, wildboar, roebuck, hedgehog, and wolf, above them and below them; and in the same degree of preservation in all respects he found the rolled and scattered bones of men. None of the common marks of burial were seen. None of the bones were gnawed, as if by animals. No coprolites or fossil dung of predatory beasts were found; the caves had not been dens. The osseous stratum was an undoubted aqueous deposit, brought into the caverns through fissures communicating with the surface. Thousands of snail shells, and one snake, a few fresh-water fish-bones and the bones of several birds led to the same conclusion.

In the Engis cave, eight miles S.W. of Liège, fragments of three human bodies (chiefly skulls) were found. The now celebrated Engis skull lay buried, five feet deep, in the mud beneath the alabaster covering, along with a rhinoceros tooth and reindeer bones.

In the Engihoul cavern opposite, remains of at least three bodies were discovered, chiefly belonging to the arms and legs.

The Chokier cavern, two and a-half miles S.W. of Liège, afforded many fragments of the bodies and limbs of bears, but skulls were rare; in other caves bear-skulls were numerous, and trunk and limb bones rare; at Goffontaine all parts were in proportion. In the Chokier cave he found a polished bone needle with a hole pierced through its base for an eye. Another cut bone was found in the

* Desnoyer, Bull. de la Soc. Géol. ii. 252. And S. V. Caverne, Dict. Univ. d'Hist. Nat. Paris, 1845.

† Recherches sur les ossements fossiles découverts dans les cavernes de la Province de Liège, 1833-1834.

Engis cave ; and rude flint instruments, distributed through red loam, were common in all the other caves.

Mankind were obviously then contemporary with the extinct carnivora and pachyderms. So much was certainly made out. But still, it had not been proved that these tropical creatures had ever lived in Europe. Schmerling imagined therefore (that panacea for all geological difficulties) a cataclysm or deluge, of undetermined date, which had swept their bodies over from Africa to bury them upon the shores of the Northern seas. Whether they had first been left as a diluvial deposit on the surface of the land and afterwards found their way into the caves he did not undertake to determine. And he still further puzzled the whole question by asserting that among the various remains of other animals he had found those of the South American agouti, which however afterwards turned out to be those of an extinct species of French porcupine.

Eight more years passed in fruitless speculation ; during which the patient Belgian continued to be let down by ropes from the top of the crags which make the valleys of the Meuse the most picturesque in the world, and to crawl on his hands and knees, pick in hand, through the dripping caves and fissures which penetrate the Devonian limestone in every direction ; visited by geologists and archæologists from all parts of Europe, who could only tell him stories of similar discoveries made by themselves in other regions, but nothing new ; nothing to shed light upon his splendid cabinet ; nothing to solve the riddle by. Then Isis smiled upon her puzzled priests, lifted another corner of her veil, and made a new suggestion. The answer to the conundrum began to shape itself at last in intelligible words.

It was now 1841, when an old antiquary, walking out from his chateau in the little city of Abbeville, through which the highway runs from Boulogne-sur-mer to Paris, where it crosses the river Somme, watched one day workmen shovelling gravel from the quarries on the heights beyond the city walls. Among the fantastic forms of flint which they threw out his quick, experienced eye detected, as he thought, one that looked unnatural. He picked it up and looked at it more carefully. Could he be mistaken ? Had he not seen such in cabinets of anti-

quities? The more he looked at it the more he was convinced that it had been tampered with; in fact, manufactured by the hands of man. Yet how could that be? He asked the workman to show him the exact spot from which it had been shovelled. It was a bed of waterworn and broken flints, deep beneath the surface, covered by a deposit of loam, several yards in thickness.* None of the other flints showed the same marks. They were rounded, except where broken across, knobbed like potatoes when they grow in a bunch attached together, and coated with a crust of dull white substance due to the decomposition of their surfaces. The piece he held in his hand, on the contrary, was of a regular shape, chipped to an edge on both sides, and brought to a point at one end by the loss of a multitude of little flakes, such as no attrition or percussion in running waters could possibly effect. The other end was round and still retained the dull white crust which characterized the unmanufactured flints among which it had lain embedded. He took it home. He went into his museum. He compared it with stone hatchets, arrow-points, spear-heads, chisels, and pointed tools of various kinds which he had got from the Druid barrows and dolmens of Normandy. There was no mistaking its resemblance to these works of human art, some of which were more carefully prepared, and were even polished; but others of them were quite as rude as the one which he had found.†

Here then was a discovery! But he was enough of a geologist to see all its difficulties. He must be still more sure that it was a genuine inhabitant of that bed of flints beneath the bed of loam. Nay, his specimen would be laughed to scorn if he presented it to the learned world by itself. All the world would say that he had dropped it

* For a section and description of this famous locality, see Lyell's *Ant. of Man*, p. 135. See Prestwich's section of the valley in the *Journal of Geol. Soc.*, London. For section of description of Menche-court quarries see *Proceedings of Amer. Phil. Soc.*, 1864.

† There are also deeper cavities flaked out for the ends of the thumb and index finger to be noticed in many of these tools, while some are shown in this way to have been used alternately or at pleasure by grasping either end.—See also Mr Ramsay's testimony, in Lyell's *Antiquity of Man*.

accidentally from his pocket in among the *débris* of the quarry, even if politeness or good nature prevented a more damaging insinuation. Perhaps some workman had picked it up upon the surface of the ground, and dropped it in the quarry. All cabinet collectors know how often specimens get into wrong boxes. All geologists know how easy it is to mistake the situation of a fossil. He must find more of them or say nothing more about it.

For six long years Boucher de Perthes became as sedulous a hanger-on about the quarries in the valley of the Somme as any seedy old nobleman in the Quartier Latin about the Luxembourg. And he was rewarded. As the workmen advanced the headings of their pits and opened back the flint bed which had the loam above it and the solid chalk below it, the antiquary stood by (or his servants for him when he was sick) and selected out the manufactured flints one by one as they appeared. He fed the workmen themselves to vigilance. When a flint instrument appeared they would leave it in its place and send for the old crazy man, as they thought him, to come from the city and take it out of its long resting-place himself. The number thus obtained was immense. At last he could contain his knowledge no longer. He took a thousand of them up to Paris and showed them to the Academicians. But what did these men know? It was a favourite jest of a French wit that all the science of the Royal Academy of France was, in the head of its 41st member. It had but 40 members. Boucher de Perthes was as much the old crazy man at Paris as at Abbeville.

In 1847 he published the first volume of his great book, *Antiquités Celtiques*, in which he gave a full account of his discoveries, calling them antediluvian, because they were made in the bottom layers of what all geologists had called the great Diluvium, or Diluvial Drift, taking their terminology from the science of the Middle Ages, based on the stories of the Sacred Scriptures of the Jews. His account produced no impression. It was puzzling enough to solve the riddle of the caves; this man had proposed a still more tremendous problem: how the remains of man came to be buried in the rocks themselves. The easiest way was to ignore the whole affair. Some denied that the tools were anything more than natural fragments. Others

denied that they were found 30 feet beneath the surface. Elie de Beaumont, the disciple of Cuvier, and the head of the geologists in France, reasserted Cuvier's opinion that the old gravel-beds of the valley of the Somme had slipped down the hill-sides to their present situation; therefore he did not care whether the flints were manufactured or not; whether they were found 30 feet below the surface or not. The quarries were only worked in winter; nobody in his senses would leave Paris in winter-time to prove the assertions of a provincial antiquarian whose whole story was improbable, and if true would upset all preconceived opinions. Even Dr Rigollet, who lived in the same valley at Amiens, not 30 miles from Abbeville, and who had written in 1819 a memoir on the fossil mammalia of the valley, took no pains to verify his neighbour's facts for more than three years after the *Antiquités Celtiques* appeared in press, but denied them heartily, until he one day paid Boucher de Perthes a visit and returned to his own home only to find similar evidences of man's early existence in its immediate vicinity; nor did he publish his recantation for four more years, after he had made a large collection for himself.

And so the matter rested. Boucher de Perthes went on collecting specimens and enlarging and arranging his cabinet, biding his time. It came at last. He was now the great man of the day in geological archæology; for, like Linnæus, and Cuvier, and Lavoisier, and Hunter, he has started one of the sciences on a new career. Let no man doubt his own genius! it is the suicide of immortality!

The final impulse came at last, not from Germany the land of abstract ideas, nor from France the land of wit and mathematics, but from conservative, plodding, snobbish, prosaic old England the land of tardy, ungraceful, but staunch, indomitable love of justice and the truth.

It had got to be now 1858, when the mouth of a new bone-cave was discovered at Brixham,* five miles west of the old Kent's Hole,† and the Royal Society deputed its two most

* Three or four miles west of Torquay.

† One mile east of Torquay. In this cave Priest M'Enery had found about 1830, in red loam under stalagmite, mammoth, tichorine rhinoceros, cave bear, &c. &c., with flint; and Lyell thinks he was only prevented by his respect for Buckland from expressing then his conviction that these were contemporary fossils. (Note on p. 97 of Lyell's *Ant. of Man.*)

famous diluvial fossil hunters, Mr Prestwich and Dr Falconer (returned from a glorious career in India and now alas lost to us just as he had become one of the masters in our Israel) to examine it. They came—they saw—and they were conquered. The united length of five galleries cleared and examined was several hundred feet. Their width nowhere exceeded eight feet. Sometimes they were filled to the very roof with gravel, bones, and mud, the latter always covered with stalagmite, from 1 to 15 inches thick, itself sometimes containing bones, e. g. a perfect antler of a reindeer and an entire humerus of a bear. The loam or bone-earth under it was from 1 to 15 feet in depth. The gravel at the bottom contained no relics, and was sometimes more than 20 feet in depth. No human bones were found, but many flint knives, chiefly in the lowest part of the red loam, one of the most perfect having 13 feet of bone-dirt over it, and some of them found directly underneath the extinct forms embedded in the stalagmite covering and therefore necessarily of an older age. To add certainty to the date a perfect knife was found close to and on a level with the left hind-leg of a cave-bear, which had all its parts arranged in such complete order that they must have been held together by the tissues when they were floated into their resting-place beside the knife.

One more step taken and Boucher de Perthes was vindicated and revenged. The step had to be taken. The explorers could not help noticing that the country about the Brixham cave had suffered great changes to permit the cave to be thus filled. The valleys had been lowered at least 60 feet since the introduction of the gravel to the cave. Then, a strong stream ran through it rolling stones along. As the waters became more quiet the red mud was deposited; finally, the alabaster drippings had their day, interrupted by recurrences of rainy eras of unknown duration. The geological age of the deposit was therefore immense.*

Dr Falconer, shortly afterwards, on his way to Sicily stopped at Abbeville and wrote to Mr Prestwich that it was now high time to do something about the much-dis-

* See Lyell's discussion of the change of climate, based on the character of the *Cyrena fluminalis*, and of the change of sea level, *Ant. Man*, pp. 143, 177.

puted flints of Boucher de Perthes. Immediately a crowd of people, John Evans, Mr Flower, Sir Charles Lyell, Prof. Rogers, Mr George Pouchet, M. Gaudry, M. Hébert, Desnoyers, Quatrefages, everybody, now rushed down to Abbeville, to St Acheul, to Rouen and to other places in the valley of the Somme, to pick out flint implements with their own hands from the diluvium. Soon a trade sprung up between the quarrymen and travellers of all kinds. The demand began to exceed the supply. The workmen made experiments, and finding themselves as good as savages, forged ancient knives with modern hammers out of the diluvial flints. The cabinets of Europe and America became stocked from Moulin Quignon and Menchecourt, and the whole valley of the Somme fell once more into disrepute.

But the whole thing was now *un fait accompli*. People were at last convinced that man was no exception to the fossil world. Englishmen who had fought so long against the ante-diluvial age spread themselves through the libraries of Oxford and Cambridge, and over the bogs and deltas and downs of Great Britain, only to discover similar worked flint deposits in diluvium with extinct animal remains in many places themselves, and records of such discoveries by others more than two centuries before.

A new impetus also was imparted to the exploration of new caves, which is still carried on with unabated energy and fine results. I have already tasked your patience too severely this evening to impose upon you further even a rude sketch of what these last seven years have produced: the labours of Lartet in the south of France; the discovery of the Neanderthal skull; the explorations carried on in the lake villages of Switzerland; the cleaning out of a great fissure in the Gibraltar mountain, and the curious skeletons found therein; the discovery of human bones in the diluvium of Abbeville; * the claim of Desnoyers to

* For the discussion on the jaw, see Quatrefages in the *Contes Rendus* Lyell, Vogt, &c. In the *Bullet. Soc. Géologique de France*, xxviii., Nov., Dec., 1864, p. 93, M. de Mercey refers to the discovery of the jaw, 28th March, 1863, and subsequent discoveries by Boucher de Perthes of others at the base of the diluvium and in the top sand-layers. He adds that he himself, with Dr Dubois and M. Buteux, saw others taken out from the base of the deposit, July 16th, 1864; and with Boucher de Perthes, Dubois, and René Vion, Sept. 27th, 1864, a metacarpal bone and left index per-

the determination of *tertiary* human relics far older than the *post-tertiary* flint instruments of St Acheul and Abbeville.* Some of these topics should come up again in my next lecture on the comparative dignity of man.

But I cannot close to-night without making certain that the gist of the question of man's comparative antiquity is clearly understood. It is not a question of a definite number of years. No geologist pretends to fix an exact date to any event in geology. It is one of the comparative sciences, essentially so. The difference between tertiary and post-tertiary counts for almost nothing in the entire column of formations which compose the crust of the earth, as the tabular view next page will show. Yet it is immense, enormous, shocking to the mind of man when applied to his historic life on earth. It is considered a triumph of discovery when we succeed in finding a reptile, or a fish, or a plant in a subordinate formation only one degree older than the oldest stratum in which as yet we have discovered it. The whole creation has seemed as if creeping backward—downward in the column of rocks, backward in the ages—by such discoveries, annually nay daily made by that busy crowd of lonely explorers whom, if we had Uriel's eyesight, we might see creeping and climbing and hammering and picking and pocketing for home examination, note-book in hand, dispersed all over the civilized, and here and there to be descried in the most remote corners of the uncivilized, world. These men are poets, working out the rhymes and the rhythm of that great psalm of life which is to be sung in chorus when all work is done; when the young men will have *much* to say to

fectly preserved, ascribed by Gaudry to an adult man of ordinary size. His whole paper, pp. 69—104, is full of interest; it is entitled, Note sur les éléments du terrain quaternaire aux environs de Paris, et spécialement dans le bassin de la Somme; par M. N. de Mercey. It is illustrated with numerous excellent sections, &c. Also Troyon's L'homme Fossile, p. 30.

* I say nothing of the human pelvis found at Natchez, and too confidently accepted by Sir Charles Lyell (p. 200), because grave doubts still hover about its authenticity. But while putting these pages to press the news from Paris was received that at the meeting of the International Anthropological Society in that city in August of this year, 'two memoirs due to the Abbe Bourgeois and the Abbe Delaunay have established beyond doubt, that man was already in existence at the epoch of the Lower Pleiocene.'—See also Lyell's discussion of the Lava Man of Denise (Ant. Man, p. 194).

*Lyell's Tabular View of the Fossiliferous Strata.**

1	Recent	}	Post-tertiary.	}	Tertiary or Cainozoic.							
2	Post-pliocene											
3	Newer-}	} pliocene	}			Tertiary or Cainozoic.						
4	Older-}											
5	Upper-}	} miocene					}	Tertiary or Cainozoic.				
6	Lower-}											
7	Upper-}	} eocene							}	Tertiary or Cainozoic.		
8	Middle-}											
9	Lower-}											
10	Maestricht beds	}		}	}						Secondary or Mesozoic.	
11	Upper-}											} white chalk
12	Lower-}											
13	Upper-}		} green sand			}						Secondary or Mesozoic.
14	Gault }											
15	Lower-}	} Wealden	}	Secondary or Mesozoic.								
16	Wealden											
17	Purbeck beds											
18	Portland stone	}			}	Secondary or Mesozoic.						
19	Kimmeridge clay						} Jurassic	}	Secondary or Mesozoic.			
20	Coral rag											
21	Oxford clay											
22	Great Bath-}		} oolite	}			Secondary or Mesozoic.					
23	Inferior-}											
24	Lias	}	}		Secondary or Mesozoic.							
25	Upper-					} Triassic		}	Secondary or Mesozoic.			
26	Muschelkalk											
27	Lower-	}		}		Secondary or Mesozoic.						
28	Magnesian limestone or						} Permian			}	Secondary or Mesozoic.	
29	Coal measures											
30	Carboniferous limestone	} Carboniferous	}		Secondary or Mesozoic.							
31	Upper-}						} Devonian	}	Secondary or Mesozoic.			
32	Lower-}											
33	Upper-}	} Silurian		}		Primary or Palæozoic.						
34	Lower-}											
35	Upper-}	} Cambrian ? = Huronian	}		Primary or Palæozoic.							
36	Lower-}											
37	Upper-}	} Laurentian					}	Primary or Palæozoic.				
38	Lower-}											

* Antiquity of Man, p. 7. The Huronian and Laurentian are added to complete the column.

the prophets that will astonish them. And nothing will more astonish them than what they shall hear sung of the antiquity of the race which they belonged to, and glorified, but which they imagined had been created only two or three thousand years before their individual selves.

I said, no scale of years ! I must modify the expression. I should have said no scale of years in a condition to be used. Imagine a corps of detectives, belonging to the secret police, excited by the news of the commission of some masterpiece of felony, and stimulated by professional zeal, ambition, and the hopes of a large reward, who have come upon the trail of the criminals, have found traces of their work, have collected a little heap of letters torn into minute fragments by the rascals, and are now sitting round a table sorting the tiny shreds, all crumbled up and half illegible with lying in the mud. See them examine piece after piece and utter a suppressed exclamation when they detect a part of a word that they can recognize ! See them lay the ragged edges of a dozen of them together and shift and turn them about until they fit and form a larger piece ! See them hand their odd pieces across the table to each other, that what one man cannot use another may be more fortunate with ! Until the hours go by, and the documents begin to assume a form, and the handwriting begins to make sense, and the key is got, and they break up the midnight party, tired, but jolly, and masters of the evidence that shall hang the rogues !

Such, if you will believe it, is the condition of the scale of years, which (originally, perfect and abundant evidence of the work which sunlight and moon-attraction have been doing on the surface of the earth) has been all torn to pieces, defaced and covered up by the same cunning sun and moon,—is now being picked up and washed and put together and restored by the geologists. The rings of bark in trees submerged in deltas ; the rain-drop, worm-trail, footstep impressions left on the thin laminæ of tidal estuary mud ; the growth of peat in ditches cut for fuel at the present day ; the wear and tear of basaltic columns against which abut the arches of a Roman bridge ; the number of lava currents and intervening vegetable moulds over buried cities ; the height of belts of teredo holes around the columns of Jupiter Serapis at Baiæ ; the

annual rate of emergence of well-known boulders in the waters of the Gulf of Bothnia, and of submergence of the missionary villages of Greenland;* the measurement of the three arches of black mould in the railway cutting through the cone of the Tinière in the Canton de Vaud, the upper arch containing iron relics of the Roman age, the middle arch containing bronze relics of the copper age, and the lowest arch containing only hammers and arrow-heads of the stone age, and calculated by Morlot to be from 5000 to 7000 years old; the rate of growth of successive layers of cypress forests found in probing the plain of New Orleans; the rate of growth of the concentric coral reefs of Florida; the annual rate of increase of the Nile sediment obtained by many scores of borings, made across the valley; the rate at which old Sanscrit books inform us of the settlement of the valley of the Ganges, and the filling up of the marsh lands of Bengal;—all these and many more are fragmentary shreds of a scale of years, which we hope some day to put together so that we can read and use it to determine the length of time between the close of the tertiary era and the present day; between the close of the tertiary era and the glacial drift; or if nothing more, the date of the glacial epoch itself, *previous to which* it seems that man existed on the earth.†

* Here would come in the whole subject of *terrace formations*, much too extensive a theme to be meddled with in a lecture. See, for example, those of Quain Clubbe, in Lyell's *Antiquity of Man*, p. 240. See also J. F. Campbell's *Frost and Fire*, i. p. 357. Lond. 1845. Lyell's *Principles*, xxx. ch. Chambers made the Quain Clubbe terraces respectively, 56, 65, and 155 above the sea; but at Trondjim there is one 522 feet above sea-level. According to Celsus and the ancient geographers, Scandinavia was an island after the time of Pliny and before the 9th century. (Lyell, p. 52.)

† But Lyell seems to assert the contrary, when he says (*Antiq. Man*, p. 241), 'This period [of continental ice], probably anterior to the earliest traces yet brought to light of the human race, may have coincided with the submergence of England.' 'And the accumulation of the boulder-clay of Norfolk, Suffolk, and Bedfordshire' (p. 218). On the other hand, it is very evident from Heer's account of the Uznach (Zurich) peat-coal beds (in his *Urwelt der Schweiz*) occurring, as they do, between two boulder-clay formations, that there were two separate glacial periods with a modern climate period intervening. So too the Sahara seems, by Desor's account of Marés's discoveries of fresh-water shells (*planorbis*) 92^m. down the artesian wells, to have been twice submerged, to correspond with the two glacial eras. Desor shows by the New Zealand glaciers, &c., the improbability of any *universal* glacial era.

In conclusion, I will adduce one more such fragment. It is not only a remarkable example of the method to be used, but to show you how well based our hopes must be. It is, in fact, the latest, the finest, and if it were proved genuine, an absolutely perfect demonstration of the great antiquity of man. It is not in any of the books; I trust that M. Agassiz on his return from South America will be able to set before us its full value. I obtain it through my friend, Dr Henderson, of the United States navy, himself an experienced geologist. But the actual observer of the fact was a Naturalist of Rio Janeiro, Dr Ildefonso, formerly well known to the scientific world.

Dr Ildefonso, with his amiable daughters, had been amusing themselves for a number of years before Dr H.'s visit, in exploring the stalagmite caves which are scattered over a considerable region around the harbour of Rio. He had obtained a multitude of fossils from a bone-clay beneath the stalagmite floor, similar to that which characterizes the ossuary caves of Europe. Among these fossils I understand that he had found the vestiges of man. But the important point lies here. The stalagmite deposit over the bone-mud is not an amorphous and irregular plate, as it necessarily must be in climates like ours where rain falls at all seasons of the year and the dripping of carbonated waters from the roof must needs be therefore continual. The climate of the tropics is humid only half the year and dry the rest. Consequently the alabaster of Brazilian caves shows annual laminæ of growth analogous to the ring-growth in trees. Now Dr Ildefonso asserted that he and his daughters had repeatedly counted these annual layers and found them number as high as twenty thousand.

I leave you to draw the inference. Agassiz estimates the age of some fragments of a human skeleton which Count Pourtalés found embedded in a coral reef in Florida at 10,000 years.* Dr Dowler estimates the age of a human skeleton found beneath the fourth cypress forest at New Orleans at 50,000 years.† The borings of Linant

* The southern half of the peninsula is post-tertiary, and Agassiz says 135,000 years were needful for its formation. See Nott and Gliddon, p. 52.

† Types of Mankind, p. 352.

Bey brought up works of Egyptian art from a depth of 72 feet, which M. Rosière estimates at 30,000 years. If Girard's estimate of the growth of the Nile mud be considered more correct, the burnt bricks found to the depth of 60 feet below the surface in the borings of Hake Kyan Bey must have been 14,000 years old. Yet these are mere modern alluvions compared with the diluvium of Abbeville. And this again can bear no comparison in antiquity with the least ancient of the true tertiary strata. My own belief is but the reflection of the growing sentiment of the whole geological world—a conviction strengthening every day, as you may with little trouble see for yourselves by glancing through the magazines of current scientific literature—that our race has been upon the earth for hundreds of thousands of years.

In what condition I will endeavour to suggest in the next lecture.

But as I have given a general scheme of formations on page 62, and as I have referred repeatedly to the fossil species with which the remains of man are found in the ossuary cave mud and the diluvium, I shall add here the latest classification of the subdivisions of the human epoch based on contemporary animal remains, and given by Prof. E. Renevier, of Lausanne, in a note supplementary to the posthumous work of M. Troyon, entitled *L'homme fossile* and published in July of 1867.

M. Lartet distinguishes four ages of mankind:—1. the age of the great cave bear; 2. of the elephant and rhinoceros; 3. of the reindeer; 4. of the aurochs.

M. Troyon, following M. d'Archiac, describes in his chapter of the four epochs of the age of Stone:—1. the epoch of the great bear; 2. the epoch of the mammoth; 3. the epoch of the reindeer; 4. the epoch of the Urus.

M. Renevier's scheme is as follows:—

I. EPOCH ANTÉ-GLACIAL, in which man was contemporary with the *Elephas antiquus*, *Rhinoceros hemitœchus*, and *Ursus spelæus*. During this period man has not been proved to exist in the Alpine regions of Europe.

II. EPOCH GLACIAL, during which man was contemporary with the *Elephas primigenius*, *Rhinoceros tichorhinus*, *Ursus spelæus*, &c. Switzerland desert and covered with glaciers, to the exclusion of man.

III. EPOCH POST-GLACIAL, during which man, contemporary of the *Elephas primigenius* and *Cervus tarandus*, had approached the Alpine countries as near as Schussenried in Wurtemberg.

IV. EPOCH ACTUAL, during which man had penetrated Switzerland, with the *Cervus elaphus*, *Bos primigenius*, &c., and begun to construct plank villages on piles in lakes which had the same water-level as at present.

LECTURE IV.

ON THE DIGNITY OF MANKIND.

MAN walks enveloped in the mystery of his own existence. How he exists he knows not. Why he exists he can only conjecture. What he is, is the last question ever answered to his satisfaction, by God, by nature, or by his own heart. All philosophies have been poor inventions to manufacture weak replies to it. To-night we stand as helplessly aghast at our creation as if no generations had preceded us. We look into each others' faces and wonder how it comes that we are formed erect, intelligent; while things around us creep, or swim, or fly, speechless and servile.

Out of this wonderment has sprung the science of Comparative Zoology. Anxious to know ourselves, we turn from side to side to examine curiously the living creatures in the world about us. Perhaps comparison with them will teach us something.

Among the endowments of our human nature must be numbered a keen sense of its own dignity. It is possible that animals may enjoy and be benefited by a like consciousness. Some of their actions intimate as much. You remember the fable of the Artist and the Lion.

The artist showed the lion his last picture, a lion slain by a man who stood in a conquering attitude over him. 'It is a very fine painting,' remarked the lion; 'that is, considering that the painter was a man; but if we lions were artists we should manage the subject more agreeably to the truth and fitness of things; the posture of the two principal figures would be reversed.'

In ancient times apologue and allegory was the favourite

form of uttered wisdom. Euclid and Æsop ruled the world of intellect together; and were as truly the masters of the masters of the portico and the grove as the child is father to the man. The fable is a key to the transition of man from a state of barbarism to a state of civilization. It marks the joining line where the quick observant fancy meets the reflecting intellect. The vivacity of nature is not yet lost; the majesty of knowledge is not yet quite assumed. The poet, the philosopher has been born, but the *funiculum uteri* is not yet cut. The fable is a constant quantity in the Development Theory; and rules as mightily to-day among the Red Indians of America, and among the boys of the public schools of Boston, as ever it did in the days of Samson and Abimelech.

Necessity is the mother of that invention which we call Natural History. Whatever the exigencies of the savage life demand, that, of course, monopolizes all its energies of observation. The Indian tribes of our North-West when asked the name of any one of the thousand flowers which bloom upon their prairies, answer simply, 'flower.' They have but this one name for all of them, for all of them are useless. But if you ask these savages the name of any of their trees you will receive a score where we have only one, for they employ a separate name for every slight variety of every species of growing wood; because their very lives depend on knowing which will serve them best. Consequently, the names they give describe utilities. It is a mistake to suppose that savages have keener senses, or superior powers of observation than the highly-educated and more intellectually endowed civilized man. For discrimination is more the product of systematic language than of eyesight. Yet, on certain sides, the sides of life and death we may well call them, the unhappy savage makes himself amazingly acute. His names for things which interest him are a study of precise description. But he always seizes his victim by the hair of the head; he calls things only by their initials; therein he differs from our naturalist who must give Christian, middle, and surname in full, and loves to add the title and address besides. The savage lights up his subject with a flash; in the dark chamber of the pyramid, his living tomb, he

walks by matchlight, not by sunlight. But his match is a magnesium wire; and for the moment that it lasts it shines forth like the sun itself.

When the Cherokees first saw the horse bestrode by De Soto they were as much amazed as were the soldiers of Fabricius when they first beheld the elephants of Pyrrhus. But they named it instantly "the animal with a single finger-nail." Modern science has made no better generalization than this *uniungulus*. If there be a characteristic posture for a frog or lizard the Algonquin will be sure to show it on the bowl of his tobacco-pipe, the Mexican on the temple sculptures in honour of his god. Ethnologists have made great capital out of this. The oblique eye and elevated ear of the Egyptian effigy is one of the archæological puzzles yet unsolved.

The same instantaneous play of instinct, through the observant fancy of the deaf and dumb, sparkles upon the whole surface of their poetic nomenclature. They catch the slightest peculiarity of each individual for whom they need a name and name him from it by some appropriate, imitative, or descriptive gesture:—one from a mole in the cheek; another from his height or dwarfishness; another from always sitting cross-legged; another from an habitual pensiveness. We grade *nations* in the scale of civilization by this propensity. People who are given to gesticulation when they talk, the Italians and the French for instance, are set down as imperfectly cultivated nations; for gesticulation when spontaneous is imitative, the supplement of language, making its shortcomings good. The well-bred gentleman has a quiet mien because in his position the brain relieves the body of all responsibility; because abstract ideas take the place of concrete examples not only in his solitary hours of thought but in his intercourse with gentlemen. The highest conversation goes on by *hints*, not by descriptions of things. The intercourse of low-bred people and of the savage world of man in every age must ever be the prosy iteration of details.

The development of the savage faculty of observation under the tuition of our modern information makes the technical naturalist, the describer of details, the mere determiner and namer of species of animate and inanimate things. This is the lowest order among men of science,

constituting a class which represents the savage or primeval man in the circle of the highest civilization ; a class characterized also by two other well-marked traits common to savages—an inordinate jealousy and love for personal reputation in details—and a materialism, springing from too close and too uninterrupted dealings with flesh and blood alone. Even the laws which this class of naturalists discover are laws of *form*, and are soon personified by them as the sole deities.

No student of nature is competent to be ennobled until he has begun to reason largely upon his observations and to put his well-bred fancy to its higher trials with courage, hope, and modesty. The genuine man of science is like the new spider which they are studying at the Cambridge Botanical Gardens. It has two spinnerets. With one it spins a coarse, strong, silvery-coloured thread which it uses for the radii and stanchions of its web. Then afterwards with the other it spins a finer golden-coloured silk, with which it fills-in all the intervals, and so completes the harmony and beauty of its web, establishes unity, and makes a net for every kind of flies. We tie our observations together with our theories. We strengthen science by discussing facts ; but we must reason on them or they bring us in no food. And the food we need is not barren facts for the understanding so much as noble fertile ideas for the soul.

An entomologist who neither knows nor cares to know the divine effusions of the Christian heart—who speaks with contempt of all philosophy—scoffs at the mention of the spiritual—hoots metaphysics out of the academy—and is even petulant with his brother nomenclators if they express some natural aspirations of the human heart for freer space than that afforded by the limits of a memoir on the comparative anatomy of *Holothuria Sinensis* or *Spirifer semireticulata*—such a naturalist (and there are plenty of them) is as ridiculous to the eye of science as is the clergyman who not only does not know but does not want to know the normal number of legs in the fly that buzzes about his sermon, or in the sedate old lady spider that spins in the corner of his ceiling.

In nothing is the narrowing tendency of mere terminological natural science more clearly seen in our day than in

the copious and often heated discussions to which the Development Theory as applied to man has given rise. At the risk of being accounted either prosy or else unintelligible I must endeavour to give some account of this theory, which, whether right or wrong, is too important to be overlooked, too noble to be despised, too nearly related to the truth to be treated by friend or foe with anything but the highest respect. It is, in fact, a supplement to the Nebular Hypothesis. What *that* proposed to do for the worlds in space, the solar system, our earth and its whole *inorganic* constitution, *this* purposes to do for the *organic* kingdoms, taking the subject of creation up where its first chapter ends—where life begins. Together, the two theories form one tremendous whole, one scheme of thought, the highest reaching after transcendental truth which the intellect of man has ever made.

The subject has been regarded from three points of view. Three questions may be asked respecting the plan of creation. One is a German question; one is a French question; one is an English question. Let them come in that order.

Hegel, the master of modern German philosophy until recently—and to a greater or less extent all the rest of the German metaphysicians—consider matter a mere phenomenon of mind. They believe, as Bishop Berkeley taught, that all things are ideas. They ask: What Plan had the creative intellect within itself? What was the primeval order of the Creator's thoughts? They say: If we can discover that, we need ask no more, for what we look at is not real; things are not what they seem; creation is the dream, the reverie, the phantasia of the Infinite Intelligence.

Opposed to this transcendental school stands the positivism of Comte and his numerous followers, perfectly characteristic of French thought, French life, French taste, French science. According to this, we know what we know because it is knowable fact, because the visible universe is a great reality, because its actions towards us are genuine and complete instruction. But of God and his intelligence we know nothing. The plan of creation is a catalogue of the actual sequences and consequences in nature.

In England, that clear, wise, gentle writer of our day, Herbert Spencer, is just now busy resuming all that a third class of thinkers have been saying in what may be called, with some propriety an eclectic system ; somewhat uncertain, as all eclectics must be ; but eminently practical, as all Englishmen must also be. On the one hand, they deny that we can learn the secrets of the Divine Will ; on the other hand, they deny that we can *prove* the truth of facts as everlasting facts. They prefer to say that we can only see with the eyes given us and reason with the logic of a man. They demand only what is that best mode of organizing our observations in a reasonable manner so as to produce the most harmonious and satisfying system of nature as it seems to us ; leaving the questions of reality, certainty, divine intention, and all that, entirely out of mind for the present.

You will not be displeased if I decline to enter more deeply into explanations or discussions of these various philosophic stand-points in a lecture devoted to a special subject. It would be easy to point out the numerous absurdities and inconsistencies which the uncommitted thinker cannot be blind to in their advocates, even while he finds himself bending more favourably to one than to another according to the constitution of his mind and the subject nature of his studies. Yet it is by the counterblasts of these three great winds of doctrine that the waves have been tossed so high about the double question of the Nebular Hypothesis and Development Theory. The grand debate is, on the one hand, whether God had any forthcoming, consistent, consecutive, advancing, and developing plan in his own mind before he created the universe ; or whether he fixed such a law of development in its nature ; or, on the other hand, whether all such supposed plans are merely in man's eye ; the useful but vain endeavour of us intelligent spectators to grasp the details of this divine invention in some systematic mode, to avoid confusing our own intelligence. If there be no plan except such as each man can feign unto himself, science has nothing to do with it. But if there be one, then science cannot rest until it be made out precisely, completely. If it be in nature, nature will show it by her works, or rather by her growth. If it be in God, God will declare it, *seriatim*, by miracle or

otherwise. If it be in both, man cannot fail to learn it sooner or later ; even if its most perfect comprehension be reserved for higher intelligences.

You will say that this is all words ! words ! I grant it. And yet this represents the first stage of the controversy ; and makes those who offer ' divine plans ' for consideration the enemies of those who deny all possibility of a divine plan outside of the human mind. The hostility of supporters of different divine plans *towards each other* has a different foundation. One school accuses the other of excluding God from nature ; of refusing the Creator access to his own creation. The other school retorts that it is superstition, not reverence, to require the painful, toilsome, endless supervision and revision of the Deity, if his work be perfectly constructed at the outset, and full of living, moving, renovating, growing forces, like a tree or human brain. Between these combatants who can mediate ? None but Deity itself. Science has no argument paramount to close the lists or proclaim the victor. Science is the study of phenomena, not of essences ; the measurer, not the explainer of forces ; the observer, not the comprehender of the laws of nature.

But even when we abandon, as we must, all transcendental considerations, and confine the subject strictly within the pale of science, we still hear vehement debating. If we ask men of science whether, when they examine the universe, the world we live in, the life of the planet, they discover traces of confusion and disorder, they answer unanimously, No ! Everything works according to fixed laws now ; everything seems to have come into being in an orderly manner through all past ages.

But if we ask them what particular order, or plan, or system can be made out according to which the progress of events can be classified they begin at once to contradict each other.

Remember that I am only speaking of the world of life, of the organic forms of living beings. Setting aside minor differences of view among botanists and zoologists I will designate three principal divergent theories of the development of life upon the planet, based all of them upon that record which is written in the rocks, and which you will find imperfectly described in the best and latest works

on geology. All agree, 1. That there is an evident progress in the appearance of higher and higher forms upon the planet through the geological ages. All agree, 2. That the exact epoch of the appearance of this or that form cannot be made certain; first, because the record in the rocks is itself not complete; and, secondly, because our examination of the record is still less complete. New discoveries every day teach us to be careful how we dogmatize about one shell having been created before another, or about the absolute non-existence of any bird during the previous reptilian era, &c. All agree, 3. That a multitude of intermediate or synthetic types (as they are now called) will be discovered, making the series more complete, filling up gaps between widely different kinds or genera, to say nothing of species, of animals and plants. There have lately been found, for instance, fossil horses with deer's feet, mammoths with the marsupial pouch, a lizard with feathered wings and tail, showing how little prepared we are yet to establish our schedule of organic forms.

But all agree, nevertheless, 4. That taking what has been discovered altogether, there is a marked order in point of time not to be mistaken. The most numerous fossils in the earliest rocks are corals, sea-weeds, bivalve shells, and such low forms of animated nature. In the formations over those we find land plants and fishes of low forms in vast abundance. In still higher rocks we first find multitudes of reptiles, and cephalopods among the shells. Still later comes the age of birds; later still that of the mammals and deciduous trees; last of all as a characteristic feature, man.

All agree, however, 5. That this order of events is general, not special; and only appears on a grand sketch from which a multitude of inconsistent or confusing or doubtful details are left out.

Still all agree, 6. To accept this general system of development as a rude, rough whole; a kind of blocking out the statue; and that it must mean something.

But now for what it means. Now they begin to disagree coming to particulars.

The first debate arises over the question of the *solidarity* of the system. One party contending that there is *no break* in it. The other party takes exactly the opposite

ground, contending that there can be *no real connection* in it; that the breaks in the line are infinite; that they are patent to every eye, and form in fact the very basis of the science of geology. Mr Agassiz has gone so far as to assert that two fossils, although *exactly similar* to the human eye, cannot be of the same species if they are found in different formations however near; and he has applied the same canon to the subject of different localities in one age, affirming that two shells, although to all appearance of the same species, cannot be in reality the same if found on both sides of the Atlantic.* On the other hand, Mr Darwin, following up the arguments of Lord Monboddo, M. Lamarck, and Mr Chambers, and followed in his turn by Grey, and Huxley, and other first-class botanists and zoologists,—Mr Darwin has astonished the world with the opinion, that there can be no radical disconnection between any two living beings; and that all geological gaps would be filled up and bridged over with intermediate forms if our search after them were but sufficiently shrewd and protracted. He asserts in fact, that nature started with the idea of simple cell-life, which gradually increased, combined, improved, and perfected itself through an infinity of forms of plant and animal, until we see all things as they stand and move to-day. Monboddo and Lamarck indeed gave fanciful accounts of this extensive and mysterious process; applying their theories chiefly to the case of man, to explain why he had left the trees or the shore, and how he had lost his tail. To the great naturalist of the Pacific Ocean belongs the honour of organizing in a reasonable manner this side of the question. It has therefore come to be known by the name of the Darwinian hypothesis as well as by any other. I must refer you to his own description of that theory of 'Natural Selection,' by which he tries to account for the transition steps along the line of change, and to explain the sudden and frequent breaks which are apparent in its course. It is a great thought, and deserves the honours heaped upon it. And all allow that it is true if kept *within the regions of variety*. But whether it be true for actual *specific* differences, and therefore for changes of *genus, family, or class*, there are vehe-

* Mr Conrad, who not two years ago opposed this view as extravagant, now seems inclined to acquiesce in it as probably correct.

ment disputings. And I can see no mode of settling them if we cannot take nature in the very act of exchanging one species for another, or converting one species into another.

The second subject of debate respects the *unity* of the system. Is there but one series; or are there several parallel series of organic forms?

The Immortal Cuvier established the grand quaternion of types which all modern comparative zoology virtually accepts. He divided the animal world into *Radiata* or creatures constructed as if branching out from a centre in several directions, like star-fish,—*Articulata*, creatures constructed by addition lengthwise, like the worms,—*Mollusca*, creatures with two parts symmetrically fitting along a vertical line, like the clam,—*Vertebrata*, creatures with a backbone, or, as Agassiz would have it, with two parts unsymmetrically fitting along a horizontal line.

The question then comes up, whether between these four plans on which all animals are made there can be discovered any *logical* distinction as to worth or dignity. The radiates, it is true, are all low creatures. But among the articulates we find the bee; and among the molluscs the cuttlefish, both of them creatures of high breeding and intelligence. The great development of brain indeed belongs exclusively to the vertebrates; but so far as we can see, there was yet no inherent impossibility in the attachment of such a brain to any radiated or annulated body. In fact, the backbone of a vertebrate is itself an annulated system, giving off nervous branches from a series of ganglionic nodes. It is argued then with some plausibility, that these four capital types of animal creation have no comparative dignity in themselves; and that *that* is an idiosyncrasy of man. They are each and all perfectly and beautifully adapted to their circumstances,—the mollusca to the waters, the articulata to the air, the vertebrata to the land, and the radiates to the planes and lines where air and land and water meet. It ought not, therefore, to be expected that one or other of them should take precedence in the creation either in respect to government or in respect to seniority. In other words, the earliest dawn of life should show us at the same time molluscs inhabiting the sea, insects in the air, vertebrates on land, and radiates where land and water meet.

Now how stand the facts? In the Potsdam sandstone, the rock at the base of the Lower Silurian system, and the oldest rock in which fossils have been found in both variety and abundance, there are multitudes of corals and seaweed, multitudes of worms and trilobites, multitudes of bivalves and univalves, and the foot-prints, at least, of vertebrate animals, which make the representation of all the four kingdoms complete.

If there *has* been a Darwinian development of animal life upon the planet, then it looks as if it had been carried out along four lines rather than one. Four stand-points of creative energy must have been assumed; four startings out of life must be accounted for; four mysteries, four miracles, four beginnings of creation, to be developed instead of one! But where *all* is mystery and miracle additions are hardly noticeable. It becomes Mr Darwin's business, then, not only to suggest some plausibly rational mode by which one species could gradually or suddenly pass the short interval which separates it from another; his explanation must suffice to bridge the awful chasms which have always kept these four great plans of structure separate along the lines of their development. He must show us how an animal of radial growth could be developed into one of linear growth. Nay, he must fill up the immense interval between the plant and the animal; and, finally, the chasm between the atom of carbon or hydrogen, and the nucleated cell of albumen or fibrin. He must explain the genius of life itself before he can make his law of natural selection stand for anything more than a beautifully-worded description of the ills that all flesh falls heir to when it is born upon this planet. *How* it is born upon the planet is another matter and remains unexplained by his hypothesis. We do not get rid of miracles by chasing them back along the ages to the starting-point and concentrating them there. A line of battle is not necessarily vanquished and annihilated when it is rolled up by an attack upon one flank, when there is a reserved force at the other end.

You see, this train of argument attacks not so much the special statements of the Darwinian hypothesis, as its very foundations. It says to Mr Darwin, My dear sir, you have four times as much to do as you thought you had. You must not only explain how a man came from a monkey,

and a monkey from a squirrel, and a squirrel from a bat, and a bat from a bird, and a bird from a lizard, and a lizard from a fish; but you must suggest some possible means of transforming a vertebrate fish out of a shell fish, or out of a jelly fish, or out of a lobworm or trilobite; then you must go on to show us how the first trilobite, or the first coral animal, or the first rhizopod was obtained by your process of natural selection out of still earlier *vegetable* species. Nay, you cannot even stop there. You must explain the very first appearance of living tissue out of the inorganic elements of dead matter. The world is not a unit; it is like the magic ivory balls of the Chinese shops, globes within globes, worlds within worlds—all visible through the holes in each other's peripheries.

Now what is the Darwinian answer to this objection, derived from Cuvier's four-fold classification of the animal kingdom? This:—Cuvier may not have made an absolutely perfect classification. There may be intermediate forms, which we cannot yet be certain where to place; which, when discovered, will fall as naturally under one plan as under another. We are not yet quite sure that there are just four distinct and sharply defined lines of living type-form; we are not sure that nature lays out her work in *lines* at all. She is not as linear, at all events, as our literality would have her be.

There is a just tendency in the new schools to establish rather a circular classification. The great disciple of Cuvier, whom you have had the good fortune to attach to your own city and university, and whose impulse all American science has been feeling now for twenty years, has elucidated the four types of animal life and their common appearance at the beginning in lectures which he has delivered in this room. I have not the courage even to saunter through the meadows which he owns. I refer you to his own masterly arguments. He is a vehement anti-Darwinian. But even against this master of the subject I must warn you. He has great opponents. And the most recent discoveries are also against him. There have lately been discovered infinitely older fossils than those I just now alluded to in the Potsdam sandstone. I hold in my hand a specimen of the oldest fossil in the world; and lo, it is a rhizopod, a creature belonging to the very lowest forms of

life. It is true these lowest forms are peculiarly fitted for preservation in the fossil state; others of higher form *may* have co-existed with them and been destroyed. But when we see these lowest of all known forms standing alone at the very beginning of time, and man, the highest and noblest form, appearing at the end, and an unmistakable gradation, *always upward*, through the long ages, and along all the four lines of plan—what open mind can help imbibing, if not the Darwinian doctrine, at least the spirit of the Theory of Development?

But this leads me to the third head of the discussion: the *always upward* direction of the development of life-forms. This also has not been left unquestioned. One of the most popular and powerful thinkers that geology ever owned was the lamented Hugh Miller. Large-minded and erudite, trained by patient personal investigation in the field, with a great brain and a great love of truth, he was also a religious enthusiast, bigotedly orthodox in the sense of Geneva. His views therefore as a speculative geologist were peculiar, but none the less worthy of consideration, for they insisted upon the introduction of such exceptional phenomena as the advocates of the Development Theory were too much inclined to ignore. He opposed the theory; and upon the ground that it was not complete; that not only were there breaks in the series of life-forms which could not be got over, but actual reversals of direction. He argued for a law of development actually downwards, or backwards, as well as for a law of development forwards and upwards. It is true that he made the law of degeneracy subordinate; but he still insisted that it was not exceptional, but universal, and included in the other. His notion was, that life advanced not in an obliquely rising straight line but in a succession of higher and higher parabolic curves. Each type as a whole he allowed to be nobler than the type preceding it, but not in every part or throughout its whole career. He preferred to imagine each type beginning below the maximum dignity of the type preceding it; then rising forward to a maximum dignity superior to that of the type preceding it; then falling away, degenerating and decaying to extinction. He instanced our varieties of fruits and the rise and decay of families of men as examples of this law subject to

inspection in our day. Including size and number among the elements of dignity he showed how the fossil Irish elk excelled in size and strength any now-existing ruminant; how the cave-bear, the aurochs, the mammoth, the Sivalensian turtle, the dinodon, each and all excelled the bears and oxen, elephants, turtles, and kangaroos of the present day; how the mosses of the coal-measures were as large as our trees; the frogs of the middle secondary age as large as modern elephants. Each age, said he, has been indeed an advance upon the previous age, and has brought forth new illustrations and finer ones of the Creator's skill. But each age has had its own superior glories not to be dimmed by any exhibitions of a later date. Each type has been quite perfect in itself, was made entirely suitable for the time and place of its creation; rose up to power; took full possession of its whole inheritance; grew to its utmost size; completely did its work; but when its time was past fell off and withered; grew small and weak and perished to give place to the next type, ordained to a like destiny. The appearance of man upon the earth, clad in beauty, armed with dominion, but after a time of glory falling from his first estate and becoming savage and degenerate, seemed to his eyes a natural illustration of this law. And in like manner he would explain the coming of Christ at the end of the old dispensation; and the rise of the Christian Church followed by its decay. In the same spirit he anticipated a millennium, and the appearance of angelic men perhaps to fall in turn like Lucifer and all his angels.

Geologists read Hugh Miller's book with as much delight as do other people. But they do not accept his Theory of Development; the facts on which it was apparently based, when critically examined, do not sustain it. And every geologist must feel that such a theory could never have been suggested by a summary of all known facts relating to the subject to any mind not prepossessed by a certain set of *theological* ideas. It was the last struggle of orthodoxy against natural science embodied in geology. Orthodoxy may well be proud of its advocate and apotheosize his memory; but no cause could be won so.

I would not dare to go into a detailed discussion of the

doctrine of development this evening. The literature of the subject is already copious, learned, well and clearly argued, and within easy reach of every one who feels desirous to arrive at some conclusion. I have only aimed at stating the question, and suggesting that it is an open question not only between theologians and geologists but between one class of men of science and another, and that it ought to be no bugbear in the path of generous and truthful minds.

The aim of the Creator seems to be to fill out all the possible details of his great plan, to realize all possible plans, modes, conditions, forms, powers, accidents, and relations. The highest artist wears the least mannerism. Infinite variety is the clue to the labyrinth of the universe. Infinite variety is in fact the only law of natural history as yet fully and completely established to the satisfaction of the mind of the naturalist. It has been made the law of every individual life.

First let us look within. Does not our education proceed by alternate synthesis and analysis of perceptions? We collect facts; we combine and compare them; we perceive their likeness, and discover what we call *laws*. Then we take these synthetic laws, and go to work again, seeking new illustrations and confirmations of them. Instead of that we perceive *exceptions* and *denials*. We learn to contrast and discover differences; we analyze, or separate, or tear to pieces what we had put together and consolidated. We have to do it. We find that bad bricks have got into our wall; inharmonious tints have been chosen for our pattern. We build, we weave again, now more successfully. Thus we advance; thus we enrich our life, the world, and history.

Turning our eyes again towards God, do we not see Him at the same kind of alternate synthetic and analytic creation? Herbert Spencer calls it the law of Differentiation; and shows us how the forces of matter first aggregate and then disintegrate the solid parts of the world, condensing the gases, combining the bases, dissolving the salts, crystalizing the deposits, tearing down the mountains, building up the valleys, alternately consolidating and dispersing, arranging and disturbing, forming and reforming, until that variety has been produced which char-

acterizes the present state of things. He shows how the present variety of human society has been accomplished on the same principles; the endless variety of art, of thought.

But we are only concerned now in seeing how truly the law holds good in Natural History proper. Whether we suppose one or another classification best, it all comes to this in the end: every nook and cranny of the world has got itself somehow filled with living forms, all fashioned agreeably to the circumstances of the place of their existence. As these circumstances vary infinitely, so must the living forms.* If there be an apparent advancement and ennoblement of living forms through the ages, it must be dependent in some reasonable manner upon some slow advancing movement in the physics of the globe with which the living forms must stand in amicable harmony. In geology therefore there must be some explanation for all the phenomena of palæontology. If man did not exist until quite recently, we must conclude that the earth was not prepared for him till recently. And so of all the other and lower creatures. This teaches us the needlessness of any transcendental treatment of the development theory; and the wisdom of those who keep the discussion of it down to pure Natural History facts.

One of the most remarkable and important consequences of the law of Differentiation bears directly upon the history of Man. Differentiation is not only the production of *variety*, but the production of *multitude*. Both are dependent (but in different ways) upon the bewildering network of cross acting physical forces which support and also destroy life. If these physical forces actually *produce* living forms, we see at once that they must generate them in multitudinous crowds. If they do not, but only *sustain* them and *destroy* them, we see that the Creator was under a physical necessity to place in existence great multitudes of living forms if he desired any of them to continue to exist. This is true not only respecting the mul-

* If there be 90 per cent. of carbonate of lime in the sea, there must be a vast over-proportion of infusorial forms to appropriate it, while a corresponding proportion of infusorial life of another kind appropriates the remaining 10 per cent. of silica. (See Jukes' Manual, p. 134, 135, f.)

titude of individuals, but respecting the multitude of varieties or species.

What do we see, then, when we look around us? First, as to the multitude of individuals. There are supposed, indeed, to be a thousand millions of human beings on the earth: but this is nothing. There are a thousand millions of mosquitoes in a single swamp. Each female fish produces a million of young fry per annum. Is this a law of life? Yes! but it is still more a law of death. The final cause of this fecundity must be discovered rather among the destroying agencies of nature than among its sustaining harmonies. We notice, therefore, that those animals are most prolific whose individual lives are least secure; and these are what we call the lowest forms of life. We call them so because daily wholesale destruction gives us the sense of waste and consequently of worthlessness. These are the forms which would exist during the earlier and more adventurous days when quaking lands and hissing seas and steam-filled skies made the vexed earth a most unnatural mother; quite unsafe to trust her with children of a riper nature than corals and sea-weed.

What is true of the multitudes of *individuals* is equally and for the same reason true of the multitudes of *specific forms*. Each species has a *habitat* and is fitted to it. The development theory supposes the *habitat* to have fitted up its own specific forms. Whether that supposition be true or false matters little; the fact remains unchanged in either case that each change of circumstances causes, or necessitates, or is accompanied by, some specific difference. Now if an animal can only change its nature to suit a change in its circumstances it need not perish. But this is a high faculty, scarcely exercised by any plant or animal excepting man and a few of the mammalia which keep about him. Even these exert the power of adaptation so imperfectly that they are sure to perish in the long run when taken from one climate to another; and man himself can only accomplish the immense feat of permanent migration at the risk of individual destruction, and by calling to his help the whole physical, intellectual, and spiritual worlds to be his body guards.

Nature grants the right of selecting its own food to every creature that consents to remain within the limits of

its own habitat. There and there only nature has provided exactly for the demands of its stomach, and its stomach is the wise guardian of the interests of the rest of its constitution. Liberty is perfect, because the necessary and the pleasant can be secured by the mere exercise of will. Migration must destroy or at least limit this freedom of the will. The animal that invades territory destined to support the life of other animals unlike its own finds poisons when it seeks for meat, and must endure the consequences. 'Tis now a choice of evils. The right to roam and choose at its own sweet will is gone. The will is now subjected by a judgment rendered anxious and unhappy by self-evident want of harmony between its suffering desires and nature's strange provisions. To this law all animals must be subjected which attach themselves to man. But in the highest degree it is the key to the development of man in history. The wider the migration, the greater the embarrassment, the keener the suffering; the more subjected the will, the more unfolded the intellect and passions; for hunger is fierce and cunning, while satiety is unobservant as an oyster and gentle as a lamb.

Thus it happens that every possible slightest shade of variation in the conditions of existence must be a trump of doom, or else must be provided against in the plan of the Creation by some equally subtle variation in the organs of life. This is the only explanation for that incredible number of specific forms distinguishable among the lowest ranks of animated nature. Think of it! A German entomologist has made out 820 species of insects preserved in the pieces of amber which form his cabinet, all of them, mites, gnats, mosquitoes, proboscidi-ans or sucking flies, who met their fate by sticking fast in a gum which exuded from trees of tertiary age, growing in moist low places sheltered from the wind. Of all these species only 30 were such as now belong to the mosquito tribes of Europe; 100 were species which we have at present living in America; but not one out of the whole 820 was like any of the numerous species of mosquitoes known in the south of Africa.

Think again of the numberless species of corals belonging only to one age. Mr Sydney S. Lyons' cabinet of Devonian and Silurian crinoids at Louisville, in Kentucky,

magnificently furnished as it is with genera and species, gives but a faint conception of the multitudes of separate beautiful forms which specify the various physical conditions under which that family of the radiated animals has struggled so bravely, but often so unsuccessfully, to continue to exist.

But as we approach our own times, and a quieter bosom gives suck to worthier embodiments of the wisdom of the divine, more self-sustaining, more adaptable to circumstances, more hardy, more migratory, or more inventive, we see how these countless multitudes become more moderate swarms, vast herds become small flocks, flocks turn to single pairs. Life has grown safe. A genus need no longer put forth its hundred specific forms, like tentacles, to cling withal to the tempestuous earth. Instead of one bear for the summer and another for the winter, one bear will do for both provided he may hybernate. One set of birds for north and south will be enough, if you will teach them to migrate twice every year. Let man be but a single species, yet if you give him a *mind* to be his own tailor, shoemaker, house-carpenter, shipbuilder, farmer, and gunsmith, he may inhabit the whole earth from pole to pole. This is the great argument for unity of species in the case of man; a subject, however, to be taken up in my next lecture. We are speaking now of the *dignity* of man; and of the likelihood that his numbers will be small in inverse proportion to his powers of resistance to those fatal forces of surrounding life, beneath the blows of which all meaner images of God have been in past times overthrown and utterly destroyed.

It is this ability of man to protect himself against nature that affords us an explanation of the paucity of his remains as fossilized. For, in the first place, as I have just explained, the race of man has been a *scanty race*. And, in the second place, the individual man has been a *cunning fellow*, always on his guard: foresighted against the malicious tricks and brutal damages of nature; wisely suspicious of the quagmires and quicksands in which the stupid mammoths were entombed; prompt to devise ex-

pedients for recovery in disaster, and, above all, able to form leagues for mutual life insurance. Yet with all his superior advantage nature was sometimes too much for him. As I narrated in my last lecture, men have been fossilized just like inferior brutes. As the eruption of Vesuvius in Pliny's days caught a few sleepers and a sick man or two when all the rest of the inhabitants of Herculaneum and Pompeii made good their escape; so in an age immensely older than the pyramids, a torrent of volcanic mud captured one of the flying aborigines of central France, part of whose skeleton is now in the museum of Le Puy. The crater from which the torrent came belongs to a group the fires of which have been extinct since the days when the rhinoceros and lion were at home in western Europe before the glacial epoch.

The care which men have always taken to secure the bodies of their relatives and friends from decay has been the chief cause of their utter disappearance from the earth. Religious veneration has produced the same effect in ages when dead bodies were burned instead of buried. The superstitious dread of being devoured by wild beasts after death has caused many races to suspend their corpses in baskets from the boughs of trees, ensuring speedy dissolution. Yet the buried bones of ancient heroes, as we have already seen, have been occasionally exhumed by floods and swept into caves and buried again in a broad common alabaster sarcophagus in the most effectual manner.

In spite, then, of the paucity of human beings to be fossilized, and in spite of the care which they have always taken not to be fossilized, they have not always escaped fossilization. But the conditions under which human fossilization became possible were so hard to realize that every case was an exception to that law which has made the strata of the earth so many cemeteries of the past, so many museums for the present. Every new discovery of a fossil human bone of ancient date is a sort of natural miracle wrought specially for science.

In studying out man's role in the great drama of the Development of Animal Life we depend greatly upon these precious relics of his existence in an older era than the present. But in determining man's relative dignity in the grand scale of animal life we have other and abund-

ant materials for thought. That scale not only ascends through all the ages, but stands to-day before us. The earth is still crowded with the representatives of most of the departed forms. Details are changed, but Natural History continues still the same. Man can be classified by what he is, as well as by what he has been. If we need see all that he can be, we need but travel from land to land, from city to country, from continent to island, from field to forest, from mountain to desert, from the ice-fields of Greenland to the jungles of India and the swamps of the gulf of Guinea; everywhere some new variety of man will offer itself for our examination,—surrounded by as various forms of lower life with which to be compared.

In spite of all this wealth of opportunity zoologists have found it a most difficult task to give an adequate and satisfactory definition of the animal called Man.

‘Linnæus led the way in this field of inquiry by comparing man and the apes in the same manner as he compared these last with the Carnivores, Ruminants, Rodents, or any other division of warm-blooded quadrupeds. After several modifications of his original scheme, he ended by placing Man as one of the many *genera* in his Order Primates, which embraced the apes and lemurs, and also the bats; for he found these last to be nearly allied to some of the lowest forms of monkeys. But all those modern naturalists who retain Linnæus’s order Primates, agree to exclude the bats (cheiroptera), and most of them class Man as one of the families of this order Primates.’*

Blumenbach (following Linnæus in 1779) proposed, on the other hand, to separate Man entirely from the Monkeys. He called the latter ‘fourhanded’ *quadrumanæ*. His definition of Man was short and simple enough: *animal, erectum, bimanum*. Buffon had used the same terms in a somewhat different way 13 years before. Cuvier used them again 12 years later. He placed the apes, monkeys, and lemurs together in one grand order, and man in another order by himself.

In spite of the authority of these four great names, modern zoologists have preferred to make man stand alone, not indeed as an *order*, but simply as a *family*. Professor

* Lyell, *Ant. of Man*, ch. xxiv.

Huxley* even repudiates the very term *quadrumanous*. He takes the ground that the hind extremities of monkeys, apes, and lemurs, bear no true resemblance at all to the hand of man. They are in all respects not hands but feet. On the other side he affirms that there is no anatomical difference of type between the hand of a gorilla and the hand of a man. The hand of the gorilla is merely clumsier, heavier, and furnished with a shorter thumb. The foot of the gorilla he shows to possess also the three characteristic features of the human foot: 1. By the same arrangement of the tarsal bones; 2. By the presence of the same short flexor muscle and short extensor muscle of the digits; and, 3. By the presence of the same peculiar muscle called the *peronæus longus*. The only difference which can be mentioned is merely formal, viz. that the great toe of the gorilla is more movable than man's. In fact, there would be, according to this, less difference between the extremities of man and the gorilla than between those of the gorilla and orang-outang;† and yet others of the monkey tribe have still more widely divergent extremities.

In like manner a comparison of the *teeth* of man with those of the apes and monkeys has failed to establish them in separate orders. 'The number of teeth in the gorilla and in all the Old World monkeys, except the lemurs, is 32, the same number as in man. The general pattern of the crown of the tooth is also the same. All the American apes, however, have 38 teeth. The only real distinction between the jaw of the apes and the human jaw consists in the fact that the eye-teeth of the apes project almost like tusks.'

If we institute a like comparison as to other portions of the frame we are led to the same results. There are sometimes remarkable differences between one human race

* Huxley's third 'Lecture on the motor organs of man compared with those of other animals,' R. School of Mines (March, 1861), embodied in his 'Evidence as to man's place in Nature.' Williams and Norgate, Loudon, 1864. [In Lyell, *Ant. of Man*, ch. xxiv.]

† The thumb of the orang differs by its shortness and absence of any special long flexor muscle from that of a gorilla more than it differs from that of man. The *carpus* of the orang and of most of the lower apes contains nine bones; that of a chimpanzee, gorilla, and man, only eight.

and another. Two years ago, Dr Broca, the Secretary of the Anthropological Society of Paris, was good enough to show me nearly 100 human skeletons which he had recently procured from a cave of the Stone age, discovered by an English gentleman in preparing a park for his new country-house about ten leagues north-east of Paris. Dr Broca pointed out to me one striking peculiarity in the anatomy of the arm-bones of this ancient race. There was a round foramen pierced through the thin curtain of bone which connects the two processes at the elbow. He assured me that he had examined hundreds of arm-bones obtained from cemeteries of the Merovingian age, but none of them exhibited this hole. Nor is it to be found in the modern human skeleton, except among the Hottentots. But it is a characteristic mark of the ape and monkey anatomy.

There is a fourth ground of comparison. If we can learn nothing from the hands, the feet, the teeth, the bones, cannot we succeed better by comparing the shape and the size of the skull with its containing brain? Professor Dana, of New Haven, dissatisfied like the rest with all other tests, finds refuge in this. He thinks he has established for the whole range of life-development a common law, which he names the law of Cephalization. All animal forms are worth precisely their weight of *brain*. Man is the noblest creature because in him the digestive and the locomotive systems become at last subordinate to the perceptive and the reasoning faculties. I cannot give you the details of his ingenious reasoning. The tendency of zoology has for a long time been to this conclusion. But even here there appears no distinction of kind but only of degree.

Owen, in 1857, unable, as he says, to appreciate or conceive of the distinction between the psychical phenomena of a chimpanzee and of a Boschisman, or of an Aztec with arrested brain-growth, proclaimed his return to Blumenbach's and Cuvier's old classification, making man a separate *sub-class*, based upon three cerebral characters. Owen's assertion was that man differs from the three mammalian classes, represented by the ape, the beaver, and the kangaroo,—1. in the overlapping of his cerebral hemispheres forward so as to cover the olfactory lobes, and backward so as to cover and quite conceal the cerebellum,

when looked down upon from above; 2. In the presence of what is called the 'posterior horn of the lateral ventricle;' and, 3. In the addition to the hind lobe of each hemisphere of what is called the '*hippocampus minor*.'*

Upon the publication of this theory a storm arose. It was shown that Owen's picture of the brain of a chimpanzee, which he took from a Dutch work, printed in 1849, and on which he based his comparison, was worthless, because it had been drawn from a shrunk specimen. M. Gratiolet, 'the highest authority in cerebral anatomy of our age,' showed by new drawings† from fresh specimens, that no such distinctions between the brain forms of man and the chimpanzee could at all be made out. The human brain which he dissected was that of a Bushwoman exhibited in London. He showed that the human and the simian brains, however convoluted in man, however smooth in the marmoset, instead of having Owen's distinctions, have four grand characters *in common*: 1. a rudimentary olfactory lobe; 2. A posterior lobe, not uncovering, but *completely covering* the cerebellum; 3. A well-defined 'fissure of Silvius;' and, 4. A posterior horn in the lateral ventricle.

To settle the dispute which, upon this, broke out afresh fifteen genera of Old World and New World apes and monkeys dying in the Zoological Gardens of London were dissected; representing almost all the forms in dispute, from that of the chimpanzee the next to man, to that of the lemur farthest removed from man. The conclusion arrived at from these and from other Continental examinations which were made at the same time was, that Owen's distinctions had no foundation in point of fact.‡

Nothing remains but the *superior volume of the human brain*, 1. Absolutely, i. e. when compared with the volume of the ape's brain; and, 2. Relatively, i. e. when we compare the brain of a man with the bulk and weight of his body; and the brain of an ape with the bulk and weight of its body.

Now Professor Huxley says that, so far as he is aware,

* Owen, Proc. Linn. Soc. Lond., vol. viii. p. 20. Archencephala was his new sub-class name. (Lyell, Ant. Man, xxiv. p. 481.)

† The false and true drawings are placed opposite each other in Lyell, pp. 482, 483.

‡ See Rolliston's summary on p. 489 of Lyell.

no human adult cranium contains less than 62 cubic inches, and that the most capacious gorilla skull measured no more than $34\frac{1}{2}$; a difference between them of say two to one—a tremendous difference! The difference between the *smallest* human skull measured by Morton, viz. 63 cubic inches, and the *largest* human skull, which measured 114, is also something tremendous—nearly two to one. If volume of brain then be the criterion, the mathematical statement of man's relation to the ape will be expressed by the series

$$114 : 63 : 34\frac{1}{2}.$$

But the series will not be complete until we add the size of the *smallest gorilla adult* skull yet measured, which was 24 cubic inches. It is, you see, a descending series, and nothing more— $114 : 63 : 34\frac{1}{2} : 24$. We may add, however, still lower figures, and keep very nearly the same proportions from among the crania of the lower orders of apes.

Language is no criterion, for every animal has a language of its own. The sense of the ridiculous is possessed by brutes, who laugh with their eyes, or tail, if not with their whole face as man does. The faculty of worship *in itself* is no distinction; for the devotion of a dog to his master, of a lover to his mistress, of a Christian to his Saviour, of an angel to his God, has the same essential root so far as we can see. Susceptibility to improvement is not peculiar to man; nor the natural law by which there occurs an hereditary accumulation of acquired powers. This also, and all the before-mentioned criteria are only available for a difference in *degree*, but not for a difference in kind, distinguishing man above the rest of the creation.

When we notice the intelligence of the dog and the elephant whose type of brain is more remote from man, and see how they manifest the possession of the moral faculties, displaying, as they do, the sense of shame, of justice, of loyalty, of compassion, we find out how little distance our reasoning can go; how imperfect are our data, how mysterious are the functions of all brain matter, how temperate we ought to be in entertaining convictions in regard to the relationship of man to other animals, how sound and high our hope of self-improvement should become, and what grandeur resides in the Apostle's words—'forgetting the things that are behind, and pressing forward to those that are before.'

Here, as in so many other similar cases, science is entirely at fault—Rasselas sitting at the foot of the wall that surrounds his happy valley. I think I can see around me in society sufficient evidences that man is a developed monkey. But what of that? Shall a wise man kill himself for shame because his ancestor, ten generations back removed, was hung for felony? What does it concern *us* that our naked and painted forefathers danced their devilish orgies round shrieking victims set on fire in towers of wicker-work, making night hideous and the angels hide their faces in pity, horror, and disgust! I confess, for my own part, aside from all considerations of actual science, I like to see every tub stand upon its own bottom. This pride of civilization seems to me the pride of parvenus. If mankind were originally apes, they have at all events acquired the right to be so no longer. The ape-like skull of the Stone age has been replaced by the skull of the poet, the philosopher and the statesman. Let us be satisfied; Christ has come. I only wish that I could present before your eyes as a worthy close to our train of thought to-night a picture of some aboriginal savage of the Stone age, and then, in divine contrast to its humiliating ugliness and base brutality, a copy of that immortal statue of the highest type of man, the Christ of Dannecker. I see you love, like the old Greeks to adorn your city and honour your great men with statues: why have you not indulged yourselves in the joy of having always before your eyes the wonder of the age—the greatest statue of the greatest Being of all ages? St Petersburg has obtained a copy of it in marble. Why should Boston be behind St Petersburg? It is worth an annual pilgrimage to Stuttgart to behold it. Such majesty! such tenderness! such intellect and wisdom in the brow and face! Such grace and beauty in the form seen through the flowing robe! Of more than mortal size, it seems no more than man—no less than all the blessed gospels say of him! the flower of the long development! the very incarnation of the Deity.

LECTURE V.

ON THE UNITY OF MANKIND.

WE are now to consider what light the modern sciences can throw upon the question of the oneness or the many-ness of mankind.

It has been common to use with great looseness of meaning the terms race, family, species, in their application to mankind.

The 'race of man' is contrasted with the animal races and the race of angels—the word *race* being the English form of the Latin word *radix*, root, and implying a common origin to all the human inhabitants of this planet.

The 'human species' is an expression even more common in late literature than the 'human race,' but quite as indefinite. The word *species* in Latin (*specto*, spy, &c.), like the word *speech* (*sprechen*) in English, has reference to the expression of the inner nature outwardly upon the face and form so that it can be understood and sympathized with.

The 'human family' is an expression merely implying the common interests of mankind as against the forest and the flood, wild beasts and hostile elements; while it includes the ideas of possible fraternity, consanguinity, intermarriage, and fellowships of every spiritual grade. When the apostle wrote 'for of one blood he hath made all the dwellers upon earth' he shared the indefinite notions of that and every other age, and expressed his Christian philanthropy in the usual way, quite sufficient for his purpose.

Our inquiry is of another order. Science is obliged to restrict words to one meaning. At the outset of a mathematical discussion the value of x is unknown; but at the close of it the value of x is made out to be some one

certain quantity, and no other. We have not yet made out the value of x in the discussion of species. We still use the terms *race* and *family* in a loose way. We talk of the various races of mankind—the black race, the white race, the yellow race, the red race. We even subdivide these, and speak of four or five black races, i. e. the Caribs of S. America, the blacks of Northern Africa, the blacks of Southern Africa, the Negrito race of the Andaman islands, and the Milaneseans of the Eastern Archipelago. Sometimes our subdivisions become small and numerous; e. g. we divide the white race into the Arian and Shemitic branches; and then subdivide the Shemitic branch into the Hebrew, the Arabic, the Coptic, the Phœnician, and other races. Ethnologists, therefore, differ in their classification of human races so much, that the number ranges from three to thirty. The questions which start up for their consideration are questions of detail, and the word *race* has in common ethnology got to confining itself to these details.

But it carries a larger significance; it has the same scope with the word *species*, with this difference: viz. that the word *species* reminds us of other animals beside man and excites the question of their possible consanguinity with him; while the word *race* excites only the question of one man's relationship to another.

My lecture this evening will therefore deal with these two subjects: race and species; or, in other words, with the distinctions of human races, and their origins. I state it in this form, so as to get rid of the transcendental discussion of species *per se*, which would absorb the whole evening and lead us to no results after all. And I take them in this reversed order of time because I do not believe in *à priori* science. We must take existing facts first and argue back from them to what has been fact in times past.

But before investigating the facts of the case, I must state the condition of our apparatus for the investigation. Taking the sciences in their order: what means do they afford us for determining the unity of the human race?

From the group of the *mathematical* sciences we get our calculations of the increase of human population; our knowledge of the relations established between physical geography and human migrations; and between climate

and character. We get also certain wonderful glimpses into the mystery of change of organic form, which, whether retained by the Creator in his own hand, or deposited by him as an efficient cause in nature, is in any view you may take of it the great central subject of this investigation.

From the group of the *inorganic* sciences we receive the discussion of facts only hinted at in the last lecture; the fossil remains of primeval men and of contemporaneous animals, and, moreover, our ideas of time.

From the *organic* sciences we get our laws of species-variation; laws which rule over both kingdoms, the vegetable and the animal, and therefore over man. Comparative anatomy, describing its collections, defines for us the limits of similarity and dissimilarity between the fossil species and those now existing; between the monkey tribes and the tribes of mankind; between the skulls found in the bone-caverns, and the skulls of Casper Hauser and Daniel Webster; between the skeleton and the skin of Hottentots and of Englishmen.

From the *historical* sciences, of which Ethnology is one, we get those facts which, on the one hand, teach the permanence of those great distinctions upon which our largest classification of human races is founded; and, on the other hand, teach those easy and rapid modifications of the human form and features, through civilization or decivilization, which may well make us liberal in our judgments both towards those who insist upon one Adam from whom all blacks and whites, yellow men and red men have descended, and also towards those who insist upon the generation of man from the ape. Herewith come in those volumes of archaeological suggestions; pictures of men and dogs upon the tombs of the Pharaohs; images of ancient Hindu and Chinese deities; skeletons of Greeks and Romans, Gauls and Finns buried in tombs and tumuli of every age back through the Modern, the Iron, the Bronze, and the Stone periods. Surely we ought to be able to come to some conclusion, however modestly, as to whether mankind is and has always been of one race; and whether there are signs of a transition from degraded ape-like forms up to the noblest figure of a man. But the list of our opportunities is not yet complete.

From the *social* sciences we get statistics, not only of the present, but of the past conditions of human life; we see how the *arts and arms* of men have come into existence and been improved, increased, and perfected, in striking parallelism with human form and human intellect; part of that development of the idea of man, which itself forms but a part of a still grander development of the idea of universal nature. The study of *ancient commerce* reflects light upon the theory of migrations, and helps to distinguish the characteristics of races. The study of *ancient war* is, in fact, the tracing of migrations as they became accomplished facts, influencing mixtures of races, and explaining the reappearance of Mongol faces in Western Pennsylvania. By the study of *ancient law* (as the magnificent book of Maine, just published, proves) we get laws of natural selection, which even Darwin hardly dreamed of; by which races were subdivided, and new forms contracted for, to become permanent in after times.

Lastly, from the *intellectual* sciences, we learn: 1. how to distinguish the races of mankind through language, and to track them in their later marchings and counter-marchings across the continents and seas; 2. how to distinguish races by their fine arts, their ethics, their worships; but above all, 3. we get some clear notion of man's relation to the brute, and are thus enabled to introduce into the purely materialistic discussion of the development theory, based on fossils and on comparative anatomy, those higher considerations which naturally and properly must have most weight with sensible, religious, Christian people.

The last condition of mankind, namely, that in which we see it now existing, resembles the last condition of the rock-crust of the earth, namely, that in which we see it constituting the deltas and the valley-terraces of existing rivers. What is this condition? It is one of disintegration, confusion, intermixture. Examine a handful of the gravel which comes in daily from Roxbury to be dumped into the Back Bay, and say what are its constituent elements? and where they originated? Pebbles of quartz, of porphyry, of micaslate, of gneiss, of syenite, white, black, red, green, and blue are there; tell me their several ages, their ancient starting-points, the course of the ice-

berg, the glacier, or the current which brought them to the quarry. The data exist. Guyot has traced the ancient moraines of Switzerland back to the existing glaciers, and thus to their mother peaks among the Alps. Nature writes out in full all her family trees. With care you can interpret them to a certainty. A labourer collecting cobble-stones at the falls of the Delaware near Trenton for the pavements of Philadelphia may wonder how this or that one can happen to differ so widely from those about it. Vanuxem, or Conrad, or James Hall would tell him by certain marks upon it that it was a piece of coral; that it grew originally in what is now the valley of the Mohawk; that ice and rain had carried it down the whole course of the river Delaware from Cooperstown to tide; and that the pebbles, among which it lies are red sand-stones of a later age from Newtown, quartzites of an older age from Easton, blue slates from the Water Gap, iron-stones from Milford, and copper-slates from Port Deposit.

Modern cities are the gravel-banks of humanity. Dis-integrated races of mankind are drifted into them. Of the 600,000 inhabitants of Philadelphia, a rude one-tenth have been brought to it on those pitiless ice-burys, the slave-ships, from the southern continent of the old world and represent all the principal subdivisions of the *black* races. A second tenth has been supplied by Suabia, Switzerland, Bohemia, Moravia, Austria, Hungary, and other native lands of the *Slavonic* race. A third tenth has come from Northern Germany and Scandinavia, and represents the *Teutonic* race, in its two branches. A fourth and fifth are *Celts*, from Ireland and Wales, the west of Scotland and the north and west of France, mixed in with Celt Iberians of Spain and Italy. The rest are lowland Scotch and English, a mongrel people made up of Celtic Britons, and Teutonic Franks and Saxons, Scandinavian Normans with Slavic, Finnish, Tartar and Shemitic streaks of blood. The *Shemitic* race is represented by thousands of Jews. And on the wharves are seen Cooleys from India and China, Malays from Singapore, and Canakas from Hawaii.

Two opposing laws work mightily and incessantly over the ethnology of such a place. One is the law of *mixture*, tending to obliterate all distinctions of race and to produce new types; the other is the law of *segregation*, tending to

draw the individuals of each stock together and to reproduce those original distinctions.

Under the first law, and by the intermarriage of the black race with the whites, we have mulattoes of every grade of colour, stature, and facial angle. Whether an improvement be the consequence men are not yet agreed. The circumstances have not yet been favourable for settling that question, nor will be until black and white can mix on terms of reasonable equality, each bringing to the other its own peculiar characteristics in full and free development. With regard to the races not so widely separated by nature or by circumstances improvement by intermixture is an established truth. In middle Pennsylvania and Virginia for example, wherever intermarriage has taken place between North-Irish presbyterian Saxons and the families of the old Swope and Hessian emigrants, a magnificent mongrel breed of people fills the valleys of the Susquehanna, Juniata, and Potomac, with frames of steel and brains of flame, the stuff of which heroes, poets and philosophers are made. No one can avoid observing the rapid improvement of the Celtic race in the United States wherever it is free to cross itself with Teutonic blood. Let all due weight be given to the other elements of progress, superior food, superior labour, superior education, still we cannot fail to recognize the crossing of the breeds as the chief hope of the nation. Civilization is the flower of migration. Every great history has sprung from some barbaric invasion. A new humanity follows every deluge. Arts and learnings are the electric lights about the wire-points where two races approximate. One kind of blood is metal to the acid of another: mix them in generous proportions and you have Hare's calorimotor on a cosmical scale; you can burn up with it the past or electrotype with it the future. When the effervescence ceases the Creator walks away; the apparatus is useless until it is charged anew.

By the law of *segregation*, on the other hand, the Germans of Philadelphia have drawn off into the north-eastern quarter of the city, and made a Frankfort-on-the-Maine of it. The blacks have appropriated the southern wards and made a Timbuctoo of them. The Irish cluster about their churches, the Jews about their synagogues,

without need of legislative enactments. The west end of one of the finest streets in Cincinnati is formed by rows of palaces, built since the middle of the war, and all inhabited by Jews. The principal Quaker families of Philadelphia still reside in Arch-street—a beautiful meeting-house a mile long and so monotonous that you might turn it end for end, or upside down, and nobody should perceive the difference.

But when groups of tourmaline or spinel segregate in the old or metamorphic rocks they are signs of age or long stagnation. A city with established quarters of distinct nationalities cannot improve at the same rate with a city like Chicago or St Louis where confusion of races pervades the place. Arch-street was long an iron bar between its legs to the city of William Penn. The prohibitory tariff which the south so long laid against the importation of Yankee blood was that which made Charles Sumner's speech so dreadfully true. The Indian tribes of North America fossilized themselves by isolation; and now they perish because they cannot marry into a stronger family. In the earlier ages of mankind this law of *segregation* ruled despotically. And why? Because it is the law which guards the individual life, without regard to the improvement of the race. That other law of *disintegration* and intermixture patronizes the improvement of the race and disregards the life of the individual. What do the forces of civilization care for the happiness or misery of the individual coal-miner that furnishes fuel for its steam-engine, or the sailor who brings it over the sea, or the engine-driver who is smashed on the experimental trip, or the factory girl, or the telescopic-lens grinder, or the Lord Premier who commits suicide, or the First Consul who eats his broken heart at St Helena? Nothing. Christianity, indeed, sympathizes with each and at the same time with all, and thus observes both laws, and employs them both for the happiness of the individual and for the progress of the race. But Christianity is a recent device of the Deity. Our theme antedates it a million years, if Desnoyer's tertiary bones were really scratched and split by the hands of men.

Questions to-night will come up such as these: Of what race of men are Desnoyer's tertiary human bones the

vestiges? In what street of Paris or Boston will you find their present representatives? Was it that primeval race which afterwards fashioned the flint implements buried in the post-tertiary diluvium of Abbeville; and those found in the bone-caverns of Belgium? Was it the race whose skeletons lie mouldering in the tumuli of the Stone period here or there? Is it one of the great existing races of the present day? How many existing races really are there? How can we distinguish them apart now that they are so intermixed? And if we can distinguish them apart, can we also arrange them in any hierarchy or natural order of mutual excellence? Are any of them essentially and incurably bestial? Can there be established any rational connection between the lowest races of mankind existing now and the oldest skulls and skeletons? Can we in any way make these an intermediate link between the Christian gentleman and the abominable chimpanzee?

These questions have been discussed by many writers, and been taken up in almost every order. Each writer has given greater prominence to one or other of them according to the special nature of his studies. Perhaps the clearest statement of them has been made by Carl Vogt, Professor of Comparative Anatomy in the Academy at Geneva, in a series of lectures delivered at Neuenburg in one of the valleys of the Swiss Jura and published in two volumes at Giessen, in 1864. His collection of facts down to the most recent discoveries of last year is comprehensive. His searching criticism of the various and opposite opinions held still by men of science illustrate the whole subject. His reputation as an anatomist is of the highest rank. His independence is as admirable as his scientific method is clear and straightforward. Whether his classification of the human races will fare better than those of his predecessors or not, the strong ground of his general conclusions, I think, cannot be shaken. They are not in fact *his* conclusions; they are the provisional sentiments of a large number of the leaders of science for the moment produced by the sum total of our information up to date, and subject of course to constitutional amendment according to law. As such I offer them for your consideration this evening.

I stated in general terms in my last lecture that no dif-

ference could be made out between man and the monkey as to the ground-plan of their forms. Their hands are planned like human hands, their feet like human feet, their brains like human brains, their jaws and teeth like human jaws and teeth, and so of all other parts of their organization.

The same, of course, can be asserted respecting the different races of men ; they are all built upon one plan. If this makes them all of one race, then it becomes also necessary to assert that men and monkeys are of one race because they are built upon a common plan.

The differences which do exist, both between men and monkeys and between one race of men and another, as well as between one race of monkeys and another, are differences *in the development of this ground-plan common to all*. Take the idea of the skull for an instance : it may be more ape-like or more man-like ; it may be brachycephalic, i. e. short for its width, or dolichocephalic, i. e. long for its width ; it may have a low, retreating forehead, or a high, erect forehead ; it may show a perfectly symmetrical curve when seen sidewise or endwise, or it may be lumpy and knobby like a laurel root ; it may be high and pointed ; or immensely developed behind the ears ; or all brought forwards over the eyes ; or bulging over the ears sideways ; it may be marked by ridges and crests, fore and aft and from side to side. All these differences you are accustomed to meet in your daily walks ; and these same kinds of differences you would see if you extended your walks to the forests of the tropics. The subject is one of degrees, or rather one of details. Just as, to use one of Vogt's illustrations, when an architect is showing his scholars the essential unity of plan which resides in all Gothic domes he explains the various ways in which the idea of this plan is unfolded in the different cathedrals of Europe.

And so of all other parts of the human organism as of all other members of the Gothic edifice. We cannot take one part as our criterion ; we must take the whole animal, the whole man. The shape of the skull is very important, because very changeable, and because skulls are attainable when no other vestige of man remains to be examined. But the shape of the limbs, the colour of the skin and

eyes, the growth of the hair—in a word, the entire aspect of the person must, in the end, decide for us his affinities, and enable us to fix those limits of variation which constitute a race. Any other method of classification would be empirical and not natural.

To show you how careful we must be to take every part of the phenomenon into consideration, and to give you an additional illustration of the delicacy and shrewdness of modern methods of investigation, I will adduce a couple of facts connected with the measurement of human skulls. It does not necessarily follow that small skulls contain feeble brains, nor that small brains in one century may not become larger in another century.

The action of the brain seems dependent upon its folded surface. Wagner has shown by the following table that women's brains weigh less than men's, but that their surfaces when unfolded and spread out equal or exceed those of men:—

Number.	Weight in gramms.	Convex surface in 16□mm of great squares.
1. (Dirichlet)	1520	2553
2. (Fuchs)	1499	2489
3. (Gauss)	1492	2419
4. (Hermann)	1358	2406
5. Man	1340	2451
6. „	1330	2309
7. „	1273	2117
8. Woman	1254	2498
9. (Hausmann)	1226	3065
10. Woman	1223	2272
11. „	1185	2300
12. Mikrocephalus (idiot)	300	896
Man,	1499 gramms weight and	2489 of surface.
Woman,	1254 „ „	2498 of surface.

It is possible thus to explain the small head and womanly intellectuality of the Hindu race.*

Another such fact is one that Broca† discovered by his measurement of skulls obtained from two Parisian graveyards as old or older than the time of Philip Augustus, i. e. of the twelfth century. It goes to show that the average

* Vogt, vol. i. p. 137.

† Ibid. pp. 106, 108.

size of the skull of the same race may increase in the course of time. 115 of these skulls from one graveyard gave the mean size of 1461.53 cubic centimetres; 117 skulls from another graveyard gave 1409.31 cubic centimetres; while that of 125 skulls of paupers, buried in a modern Parisian cemetery (1788—1824) in spite of the debasing influences of poverty measured 1484.23.

Morlot in comparing the shape and size of a multitude of ancient Helvetian skulls which he examined, with the skulls of their descendants the Genevose of the present day, comes to the same conclusion and ascribes the improvement to the influence of Christianity.

Great discussion has been had over this matter of change in the form of the human skull, on the one side under the influence of favourable circumstances, and of unfavourable circumstances on the other. The factitious reputation which the English Pritchard acquired came from his assiduous collection and collation of supposed examples of the degeneracy of people through misfortune, and of the improvement of other people through good fortune. His instances of the Turks, of the Jews, of the Irish are well known. He thought that facts warranted him in asserting that the bow-legged and savage-featured horsemen of Independent Tartary had become in two or three centuries the straight-legged handsome aristocrats of Constantinople. That the white Jews of Palestine had become under an Indian sky the black Jews of Madras. That the tall, stout, clever Irish of Meath, when driven by the English from their farms to huddle half-starved in mud-huts in the south-west corner of the Green Isle, became in a few generations the ugly, low-browed, meagre-limbed, pot-bellied, brutal creatures whom the famine drove in crowds to this country and whose well-fed children now constitute a class of our society not at all inferior to any other as far as physical and mental development is concerned.

This story of the Irish has been again taken up by one of the most exact ethnologists of our own day, M. Quatrefages of Paris. I will give it in his own words:—

‘When the British suppressed the Irish rebellions of 1649 and 1689, great crowds of native Irish were driven out from Armagh and the south of county Down, in one direction, into the mountains between Fews and the sea,

and in the other, into Leitrim, Sligo, and Mayo. From that time on, these people suffered the evil influence of hunger and ignorance, those two great spoilers of mankind. Their descendants may be easily distinguished at the present day from their relatives left in Meath in good estate. They are marked by open, protruding mouths, projecting teeth, and fletschendern gums, high cheekbones, suppressed noses, and barbarous foreheads. In Sligo and northern Mayo, two centuries of wretchedness have stamped themselves upon the whole bodily constitution, within and without, furnishing us with an example of human degeneration through known causes, so instructive for the future, as to compensate for the misery of the past. Their mean height is about 5 ft 2 inches; they are thick-bellied, crook-legged, like mis-begotten children; clad in rags they go about, the ghosts of a once full-sized, well-bodied, and courageous people. In other quarters of the island where this same Irish race has suffered no such lamentable miseries, it furnishes the fairest examples of human strength and beauty, not only physical but intellectual also. Yet this account, which makes one's hair bristle with horror, is sufficient to show how easily it can be lowered to a level with, and be made to show all the characteristics of, the lowest negro races, the most abandoned Australian tribes.'

I have selected from a great many others and given you in full this description of a case, which has made perhaps the profoundest impression upon the imagination of ethnologists, because it will not only make the question before us plain but will show how differently different investigators conclude their inferences from the same facts.

Pritchard, and his numerous old-school followers, see in this history only a fine example of man's susceptibility to change, and they prove by it and other like examples that satiety and hunger, heat and cold, field-life and forest-life, mountain-air and sea-air have been ample means for changing the descendants of the first pair, Adam and Eve, or of the second pair, Noah and Anna, into all the black, white, yellow, and red descriptions of mankind which now inhabit the globe. But in order to maintain this theory they are obliged to ignore or explain away a multitude of adverse facts going to show that this capacity of man

for change is so limited that any race subjected to adversity beyond a certain point not only degenerates but perishes entirely, like any other kind of animal.

This opposite view has been taken up with the same excessive advocacy and want of logical balance by Dr Knox and his school, who go to the extent of maintaining that no migration is possible; that the number of original human races is very great; that each of them was created to occupy a certain definite area and can occupy no other; that any translation of it from that area to another is necessarily fatal; and that the degeneration of the Irish vagabonds from Meath was as certain a premonition of extinction as the degeneration of the European emigrants to these United States must end in the extinction of our race, unless it be enabled to drag out a lingering existence here by large and constant accessions of fresh life from Europe.

Such speculations are not scientific. We call Pritchard an old foggy; we call Knox a crazy fellow. We must not only have alleged facts, we must have actual facts, sifted, analyzed, weighed, and measured, before we can begin to see our way through such a world of mystery as is this question of races. This sifting of facts is what characterizes the ethnology of the last few years.

You will ask, what opinion does Quatrefages entertain of the case which he cites so eloquently, and as if he fully coincided with Pritchard's cherished sentiments? Be not surprised when I tell you that he *doubts the facts themselves*. He quietly asks if it be not possible that the two classes of Irish peasantry thus contrasted, the one degraded to a level with Australians, the other allied to the most favoured Caucasians, ever really had anything to do with each other. 'No,' says he, 'the Irishman of Meath alone represents the old stock, he has remained at home, he has remained unaltered. The Irishman of Flews, on the contrary, placed in other circumstances, has changed himself and formed a new race out of the old one, in harmony with its unhappy surroundings. There are therefore now two races in these neighbouring counties.'

And what has Vogt, again, to say to this? Vogt smiles at Quatrefages' ingenious subterfuge. Supposing the details of the Irish story to be true, how does it affect the

question of the radical distinction between the skull of a white Celt and the skull of an Australian negro? Who has examined the skulls of these degraded Irishmen of Flews, and compared them in the light of the latest science with the skulls of the Irishmen of Meath their alleged cousins on the one side to make out the differences, and with the skulls of Australians on the other side to make out the resemblance? Has Pritchard? Has Quatrefages? Has Broca? Has Morton or Bachman? Has Scherzer and Schwarz? Has Busk, or Camper, or Welcker, or Von Baer, or Virchow, or Lucaë, or Gratiolet, or Huschke, or Aiken Meigs, or anybody? Nobody! Then what does our actual knowledge about it amount to after all? To nothing. There being no competent witnesses the case is ruled out of court.

We might spend much time in showing how all the old and well-established points of controversy are broken off in pretty much the same manner by want of proper preliminary criticism. In the Turkish case, for instance: who knows how much of the old Turkoman element still lingers at Constantinople? And where did the Turks obtain mothers for their children but from the population of the empire which they spent more than one lifetime in overthrowing; to say nothing about the mountain beauties of the Caucasus.

In the case of the black Jews of India: who does not know that the black Jews of Abyssinia boast that they are the descendants, not of the patriarchs, but of the Queen of Sheba? Their Judaism is therefore a superstition overlaid upon their blood, and cannot be adduced in proof that their Israelitish blood has ever changed even by the thousandth part of an atom of iron.

Take the case of the negroes in America, of which Lyell, and Reiset, and Réclus have written so glibly; and who knows anything with certainty about it? A land indeed of darkness and of the valley of death. We must wait until the negroes take up the question themselves; until a truth-telling census gives us facts; until a thorough and searching discrimination has been exercised. Men pretend to say that the negro race has been marvellously modified by mere change of *habitat*, by new climates, soils and foods; or as they are sometimes inclined to fancy, by

mysterious or, at least, unknown agencies. Réclus asserts his positive knowledge of the fact that as a race the negroes have advanced one-fourth way towards the form and appearance of the whites. Reiset opines that the pure-blooded Africans of the Antilles retain their native character, only *weakened*. Some writers confidently insist that the negro skin is not so black, his nose not so small, his forehead higher, his lips thinner than they used to be. Even if it were possible to discover and prove all this to be true what would it signify when we consider the consistent and universal profligacy of the whites who have lived among them and have been their absolute masters; when we consider the immense variety of thick and thin lipped, high and low browed, large and small nosed tribes in Africa from which the dreadful sum of all that evil was made up; and lastly, when we consider the operation of the internal slave trade, that Virginian pudding-stick stirred by the hand of Mammon for ever mixing up these various original and derived ingredients together, to produce a chaos of results before which any man, were he not a Charleston clergyman or a foreign tourist, would stand awe-struck and silent.

Lastly, take our own Yankee case. Listen, if you can without indulging in a hearty laugh, to the following description by Pruner Bey of the results of European emigration to America. 'Already, after the second generation,' says this shrewd observer, 'the Yankee shows the features of the Indian type. Later still, his lymphatic system becomes reduced to the minimum of its normal development. The skin grows dry as leather; the warmth of the complexion and the ruddiness of the cheeks are lost—exchanged, in the man, for a clayey tint; in the woman, for a sickly paleness. The head grows smaller, round or even pointed, and covers itself with straight, dark hair; the neck elongates, and one can see a great development of muscle in the cheek and jaw. The temples deepen; the cheek-bones grow massive; the eyes sink into deep orbits and lie close together. The iris is dark; the glance grows piercing and wild. The long bones become still longer, especially those of the upper limbs, so that gloves of a peculiar shape, with very long fingers, are manufactured in France and England for the American

market. The inner holes of these bones become narrow ; the nails grow light, long, and pointed ; the woman's pelvis approximates in shape to that of the man.' 'And thus,' adds Quatrefages, 'the Anglo-Saxon type in America has become changed and a new white race has sprung out of the old English race to which we may give the name of Yankee race.'

Now all this to one accustomed to see the beautiful women of New England and the fine-looking men of the middle States is sheer nonsense. Every intelligent citizen of the United States has travelled enough to know that the picture which Pruner Bey has given us represents no such general reality as to be of the least ethnological importance. It is a picture of individual heads, faces, and forms which contrast strongly with other and widely different heads, faces, and forms among whom they live, and moreover, such as may be seen all over Europe. There is not even a well-marked class of society in the United States to answer the description. And as for a Yankee race, no such thing exists in the sense assigned to the word by these authors. Even in New England there are recognized nearly half a dozen *varieties* of man. I could take you to a valley in Pennsylvania, fifty miles long by five miles wide, crossed by an invisible ethnological line, north-east of which the inhabitants are stout, strong-headed, handsome descendants of north Irish Presbyterians ; while south-west from it the inhabitants are Awmish descendants of Swiss mountaineers, equally good-looking in their way. Behind this valley, and on the summit of the Alleghany mountains 2000 feet above the sea, Count Galitzin established his colony of Polish Catholics, and their monastery is still in use, and so is their cathedral. Twenty miles farther north, in the heart of the forest, is the settlement of a wealthy Englishman. Thirty miles farther north, still deeper in the forest and on still higher ground, spread out the fields of St Mary's, tilled by over ten thousand French Catholics. Forty miles north-east of this and in the centre of the great forests of the Sinnemahoning Ole Bull founded his unhappy colony of Swedes. Forty miles to the north of this again would bring us to the settlements of the Connecticut men up on the head waters of the Alleghany river ; and an equal dis-

tance to the south would return us among the descendants of the race which inhabited the Black Forest and the Vosges.

Go from State to State and such facts will face you everywhere. You may draw two lines across the State of Ohio so as to cut it into three regions, each with a separate ethnological development, distinct in appearance, in their manners and customs, in peculiarities of language and in their religious habits.

But what is that Anglo-Saxon race concerning which we have heard so much and to which no one has yet succeeded in giving a form? Vogt well says that it has no existence; Max Müller confirms the statement, if it needed confirmation. It is a chaos of races, this so-called Anglo-Saxon race. And so is the population of the United States a chaos of races; an ethnological *moraine*, or gravel terrace, or delta deposit, to recur to the illustration already used. We cannot yet learn from it anything respecting those great laws of human variation which, sooner or later, will be discovered.

What the other sciences wait for is this: that ethnology should adopt some correct method of investigation. It has been well said that oftentimes a proper method of investigating is a grander and more useful discovery than any which the investigation itself may yield. For the discovery of a right method is so much absolute abstract science accomplished, involving as it does the knowledge of principal truths in their prime relations; whilst the discoveries which result from an investigation are commonly themselves mere isolated facts; and facts are good for nothing until they are synthetically converted into laws.

Now the difficulty of devising a proper method for ethnological research arises from the fact that there are two opposite tendencies in nature—the one towards differentiation or individualization, the other towards integration or generalization. Nature is for ever at war with herself, pulling down with one hand while building up with the other. She obeys blindly the law of Christ not to let her left hand know what her right hand doeth. She keeps races separate; she mixes them together. She gives to man an intense love of home, a powerful associative principle, the rage of love, the fire of friendship, the pride of country,

the bigotry of worship, the jealous guardianship of property—all this to develop the family and preserve the local type. On the other hand, she inspires the soul with a thirst for change, with curiosity concerning the distant and the new, with the love of conquests, with the hopes of betterment—all these to develop the powers of the individual man, and at the same time to spread out population as widely as possible.

These are at home with the natural law that offspring should bear the characteristic features of both father and mother. And if this were the only law of inheritance it would be easy enough to make out the exact forms and limits of each race, for its individuals would be alike. But there is another law in force, by which each child inherits only a limited selection of the characteristic features of father and mother; and one child more of one and another child more of another. One child takes on the physical form of the father with the mental character of the mother; another child reverses the order and resembles the father in mind and the mother in body. This latter law, therefore, modifies and confuses the former, establishing individual variety in the midst of stirpal uniformity. But in doing so it also provides a potent means for bringing into the history of a family a more or less complete divergence from the original type; in fact, the production of a new race out of an old one. Were this the only law ethnology would be an impossible science. Utter confusion would attend the history of human life.

But a third law has been moreover discovered. It is called in the natural history of the lower creatures the law of *alternate generation*, by which the jelly-fish begets a star-fish and the star-fish in turn begets a jelly-fish. This law is strangely powerful over human character. I think that as a rule a child is more likely to resemble its grandparents than its parents. By this law hereditary diseases like scrofula and insanity and mental and bodily peculiarities of every kind appear, lie hid, and re-appear in a series of alternate generations. This is in fact that conservative force in nature which strives perpetually against abnormal variation, and insists upon a return to the old idea. This is the-mysterious under-current by which Mongol heads and faces are forced to the surface of

some Teutonic or Celtic stream. I have seen profiles in Philadelphia which might have been copied from the alabaster tablets of Khorsabad—pure Assyrian faces, no doubt the product of Hebrew blood descended through forty centuries from Ur of the Chaldees.

The power of this preserving force of type, whatever may be its nature, stamps the great areas of the earth's surface with those unmistakable generalizations to which no amount or intensity of individual variation can make us blind. It is the genius of the *race*. On the oldest monuments of the Pharaohs the pictures of different kinds of dog are recognized by any child as the pictures of the dogs with which he plays to-day. The pictures of the Negro, the Jew, the Egyptian, the Scythian are perfect likenesses of the Nubians, Fellahs, Jews, and Turks of to-day. There you may see, portrayed in colours 6000 years old, the same slave-traders driving down the same slave coffles as in the same valley of the Nile to-day. If all the races of mankind are variants by the law of variation from the form of Noah or of Adam, then how infinitely remote must have been the time when Noah or Adam lived. On the other hand, if the law of constancy in form has kept the races apart from the beginning, how numerous must be the list of actual human races; how closely must they have been confined to their respective centres of creation; and how difficult it becomes for ethnology to devise any efficient and reliable method of research for explaining the mixture of races in the more civilized portions of the earth!

Let me fix your attention for a moment on this curious map of France, published in the memoirs of the Royal Asiatic Society many years ago. It exhibits the departments of the French empire, each overspread with a different shade of colour and marked with a certain cypher. This map affords a brilliant example of ethnological method. You are perhaps aware that the French, as a people, are mulattoes; but a general observation like that advances us scarcely a step in true science, although it may be quite sufficient to stifle the clamour which slaveholders have raised against the possibility of 'miscegenation.' It is in the highest degree desirable to know in what sense and to what extent the French people are mulattoes; in what provinces and departments they are most dark, and in what

other provinces and departments they are most white. If we could discover by some accurate method—say by that of percentages—some law of increase of the dark element in French blood in some one direction and of the white element in some other, we should come into possession of means for tracing the mixture to the former seats of a dark race in the first direction or on that side of France; and of a white race whose seat was in the other direction on the opposite side of France. Now that is precisely what this map enables us to do. You observe how the percentage-shades form belts running across the kingdom from N.W. to S.E., and how the darker belts are those upon the S.W. or Spanish side, while the lighter belts are on the N.E. or towards Germany. Until this map was constructed it was supposed that the aboriginal population of France was to be sought for in the central region of the Cantal and the mountains of Auvergne. But you see how steadily and equally the aboriginal dark or 'brown' race of France as it is called has been pressed down from the Rhine and the Channel towards the Bay of Biscay and the Pyrenees. You see how the increase of its mixture with the fair German race has been in proportion to the distance from the Rhine. As for the white race it of course belonged to central Europe, and was either Slavick or Teutonic, perhaps both, certainly in part Teutonic. But the dark race with which it mixed—what shall we think of it? Where shall we find it pure? The map suggests the only answer to these questions. The colour deepens to a maximum where the Pyrenean mountains meet the sea. These mountains are the home of three divisions of one race, speaking three dialects of one language called the Basque; a language possessing no well-proven affinities with any European tongue; but suggesting some resemblances with the language of the Finns, a people perhaps related to the same circumpolar race to which the Esquimaux belong. These Basques are sturdy mountaineers and have never been driven from their homes; but their mountains stood with their feet in the sea, and the Basques became great fishermen; the Cabots found the banks of Newfoundland covered with their boats, and it is said that they sold cod by name in the markets of Hamburg and Havre before Columbus made his first voy-

age. The native word is not 'Basque' but 'Escamara;' almost identical with Esquimaux. The west end of Brittany is peopled by a fragment of this same race preserved in the same manner among rocks and in the surf, but who have exchanged their language for a Celtic dialect. St Malo was celebrated in the middle ages for its breed of sailors who shared with the southern Basques in the fisheries of Labrador. Another and exceedingly small fragment of this mysterious and most ancient brown race exists in Ireland in the shape of a group of hamlets on the northern shore of Galway bay; the people intermarry among themselves and have little in common with the Celtic population of the country. Now if we track the brown race southward we find it as a modifying element in all the Spanish peninsula, especially among the Sierras and in secluded Portugal. Whatever was its mixture with the Celtic blood of France it formed with Celtic blood the entire humanity of Spain and hence the name which the Romans gave it, Celt Iberia. If we take this latter name Iberia and compare it with a multitude of others—I will not weary you with the details—we arrive at the conclusion that in the brown race of western Europe we have a division of the great aboriginal Berber race of northern Africa; a conclusion which it would have been impossible for the best ethnologist to have advanced with any confidence until some such method of investigation had been adopted as this map illustrates.*

Not by suppositions and conjectures but only by a rigorous self-denial of the imagination and by restricting it to its proper function, the invention of true methods of investigation, can the questions be answered which eth-

* But after such investigations have been made, these direct observations are of value. For example, in 1862, MM. Martins, Desor, and Escher de la Linth studied the Berbers in their native haunts. 'The Sufites,' writes Desor, 'are genuine Berbers, and, as such, white with black hair, like the southern Europeans; and were it not for their burnus Martins might have recognized them for a troop of scholars from some village of Provence or Languedoc. But one thing drew our attention, the very extended form of the head; they are true longheads (dolicho-cephaloi), as one sees chiefly only so well pronounced from the ancient graves; the face is angular and thin, the teeth vertical and beautifully white like those of all these peoples. The body is lank, and capable of marvellous endurance.' (Letter to Liebig, p. 29.) I say nothing here of the superb train of argument coming out of the recent researches into the dolmen or Druid architecture of Europe and Africa.

nologists are asking of each other respecting similar mixtures of the white and black races in other parts of the world; in India and Burmah, for example, where also the aboriginal element seems to have been black, and to have been mixed first with yellow Turanian blood from the north-east, and afterwards with white Arian blood from the north-west. Were this a course of lectures on Ethnology proper I would gladly take up these questions one by one. But I must occupy the few minutes I have left in sketching out the direction which the inquiry takes in bearing upon the connection of the present races with those of the Stone or Diluvial age and with the ape and monkey tribes.

The most nobly organized races are the most migratory, because they have the faculties of self-protection in the highest state of efficiency. The white Shemite, the Arab merchant, traffics in person every year from Morocco to Singapore. He has imprinted his alphabet, his cipher, his unitarianism upon a belt of the earth's surface extending from the Senegal and Gambia to Lake Baikal. He has ennobled by mixture with his own blood the Khoord, the Nubian, the Berber, and the Celt. How far back this beginning of his influence would go, if we could follow it, we cannot yet make out. But what is true of this subdivision of the great white race is true of the white race as an entire whole. It has mowed a broad historic swath along the temperate zone, subjugating, proselyting, elevating the darker and poorer races which had previous possession of the earth, the less mixed and fragmentary remains of which we find among the mountains or on promontories or in islands in the sea.

North of the belt of this historic white race lies the nearly undisturbed population of the Arctic zone. To the south of it dwell enormous separated masses of black men. I omit all mention here of the red Indians of America so as not to complicate the subject.*

* De Gobineau, in his 'Essai sur l'inégalité des Races Humaines,' Paris, 1853 (Phil. Lib.), devotes the 16th chapter of vol. i. to a description of the characteristic features of the three type races; but adds that at the earliest date we see them they were not pure, and that now they have been mixed a hundred times. (See foot-note to Lecture p. 184.)

The Melanian variety, he says, is at the bottom of the scale. The animal form of its pelvis fixes its destiny from the moment of conception.

These races seem to be as different in species as wolves and foxes differ from jackals and dogs. There is abso-

(A French *jeu d'esprit*.) It never leaves the limits of restricted intellectuality. But it is no brute, pure and simple, this negro with narrow, retreating forehead, carrying in the middle skull indications of certain grossly powerful energies. If its thinking faculties are middling, or reduced to nothing, it possesses in desire, and therefore in its will, a terrible intensity. Many of its senses are developed with a vigour unknown to the two other races, especially the senses of taste and smell. But precisely on the avidity of its sensations lies the stamp of its inferiority. All aliments are good for it; nothing disgusts, nothing repulses it. (Pruner, i. 133.) Its lust is to eat, to eat excessively, with fury. No carrion is unworthy of its stomach. Its lust for gross odours accommodates itself to those most odious. To these chief traits is added an unstable humour, a fixless variability of sentiment, annulling the distinction between vice and virtue for this race. The very rage with which it pursues the object which has put its sensitivity into vibration and inflamed its cupidity, is a gauge for the prompt appeasing of the one and the rapid forgetfulness of the other. Lastly, it values as little its own life as another's. It kills to kill; and so this human machine, so easy to set in motion, is, in the presence of suffering, of a cowardice taking refuge in death, or of a monstrous impassibility.

The yellow race presents the antithesis of all this. The cranium projects in front. Large, bony, salient often, developed well in height, vertical over a triangular face, wherein the nose and chin have none of those gross and rude projections of the negro. A tendency to obesity, though not a special trait, recurs more frequently in the yellow than in the other races. Little of physical vigour; dispositions to apathy; none of those strange moral excesses so common to the blacks. Feeble desires; a will obstinate rather than extreme; a taste perpetual but tranquil for material pleasures; rarely gluttonous, but with more choice of aliments than the negro has. In all this, a tendency to mediocrity; a comprehension quick enough, but neither elevated nor profound (quoting Carus, Weber Ung. etc., p. 60); a love of the useful; respect for law; conscious of the advantages of a certain dose of liberty; a practical race, in the narrow meaning of the word; no dreamers nor lovers of theories; inventing little, but able to appreciate and adopt what serves its turn; their desires limited to living as softly and commodiously as they can; a populace and small bourgeoisie, which every civilizer should choose for the basis of his society; but not to give society nerve, beauty, or action.

The white race has reflecting energy, or energetic intelligence; the sense of the useful in a larger, higher, more courageous, more ideal sense: a perseverance in plain view of obstacles, able to find means for removing them out of the way; with a greater physical power; an extraordinary instinct for order, not only as the gauge of peace and rest, but as the indispensable means of conservation; and yet a well pronounced taste for liberty, even in extreme; a declared hostility to that formal sleepy Chinese organization, as well as to a haughty despotism, the only bridle for the blacks. The white men are distinguished by a singular love of life, prized more because put to its proper uses by them. Their cruelty,

lutely *no* reason for supposing them to be of one species except an absurd legend ascribed to an ancient Shemitic law-giver and preserved among a number of similar legends of various dates, inconsistent with themselves, with each other and with the legends of surrounding nations. The legend of Adam and Eve makes all mankind descend from Cain first and Seth afterwards, and yet says that Cain obtained his wife before Seth was born, and in a country whither he had fled from Adam and Eve the only other human beings at that time on the earth. Then the descendants of Seth are made to live each one a thousand years, and when the earth was peopled, partly by a crossing of the human stock with angelic blood, the work of the Creator was entirely spoilt and had to be begun again; the Antediluvians were all destroyed; and Noah and his family became in their turn the sole progenitors of all our present races. As one of Adam's three sons was murdered by his brother, so one of Noah's three sons was cursed by his father and his descendants handed over into bondage to the descendants of the other two. Of this most orthodox adventure a most diabolical handle has been made to justify the enslavement of the black race by the white. This hotchpotch of old Hebrew legends, made sacred to our hearts by lectures from the pulpit and recitations at the mother's knee—this tissue of absurdity called the biblical history of the origin of mankind, is absolutely the sole and entire argument for not considering the human races as much distinct in kind and origin as are the llama and alpaca, or the vicuña and alpaca, or the springbok and the goat, or the hare and the rabbit, or the American bison and the European cow, or the wolf and

when exercised, is conscious of its own excesses, a sentiment very problematical among the blacks. Yet they find reasons for leaving this occupied existence without a murmur—for honour, first, which under slightly various names has occupied an enormous place in their ideas since the beginning of the race. Honour and its fruit, civilization, are not known to the yellow and black races. But this intellectual superiority is matched by an inferiority in their sensations. The white race is far more poorly endowed in sensual faculties than the other two. It is, therefore, less solicited and absorbed by corporal action, although its structure is remarkably more vigorous. (Martins says the European surpasses the black in the intensity of the nerve fluid. *Reise in Brasilien*, i. 259.)

Here Gobineau has his tertiary and quaternary mixtures of these three grand secondary types.

the dog, or the dog and the jackal, or the camel and the dromedary; for all these acknowledged species not only breed together but produce under certain conditions fertile offspring.*

The Swiss naturalists thought that they had established four well-defined types of Helvetic skulls: the Sion type, rather long, and low in the crown; the Hohberg type, with a pent-roof shape; the Dissentis type, bullet-headed, or square as it is usually called; and the Belle-air type, of so mixed a character that it was soon discarded. The other three are still under discussion. The Sion type is identified by the German naturalists as that of the Hügel-gräber or grave-mounds of the valley of the Rhine; and the Hohberg type (once supposed to be Roman) with that of the Reihen-gräber skulls. The Sion type is common in the caverns of Belgium and elsewhere. But in the caves of the south of France appears another type, a small round head like that of the Laplander's; and this is the head associated with the rein-deer and other animals of that remote epoch. Pruner Bey therefore, in the congress of 1867 at Paris, insisted strenuously upon the necessity for recognizing this small round head as the earliest type of man known to us. But Professor Vogt objected that the round form is theoretically the most perfect of all forms, giving most weight and least superficial exposure; but he especially recalled to view the fact never to be forgotten that the low Neanderthal skull (with others of a similar but not so excessively degraded a form) is equally ancient, and of a wholly opposite type. If the Hyperborean race followed (or led) the rein-deer to the south during the coming on of the glacial period there must have been some other race also already in the field, to meet and perhaps to disappear for a time before it, and then perhaps to reappear after the worlds of ice had melted and the Arctic zone had retreated within its polar circle. The encomiums lavished on the Engis skull are not only a little extravagant (for although it is finely shaped, it is not large), but its exact age also has never been satisfactorily determined. If however it be both very ancient and also Caucasian, then it establishes a third superior ancient race; or, much more probably,

* Vogt, vol. ii. 216. The only case of sterility, well authenticated, is that of the mule proper, the offspring of the horse and ass.

it merely proclaims the eternal possibility of individual greatness even in the worst of times.

I account it probable, then, that the races of mankind have always been distinct; and that they probably made their appearance on the planet successively; perhaps the black and meagre races first and the white races last. It would not be strange also to find their history running parallel with that of the apes and monkeys. For it is not to be denied that in the three types of manlike ape, viz. the orang, the chimpanzee, and the gorilla, the three principal divisions of the family of apes have found their last and highest development. Whether we split up the orangs and the gorillas into separate species, or only recognize in them varieties like those which separate the affiliated races of mankind, it is certain that each of the three manlike ape-forms presents its own characteristic manlike feature. The chimpanzee approaches man more closely in the form of the skull and in the character of its teeth. The orang approximates the human ideal especially in the construction of its brain. The gorilla resembles man rather in the make of his extremities. Neither one of the three can be said to stand absolutely nearer to man than the other two. All three strive to reach the human ideal, but on different sides of the common development. The orang, says Gratiolet, stands at the head of the family of gibbons and baboons on account of the size of its forehead, the relative smallness of its backhead and the development of its upper lobes: in other words, it has a better developed gibbon brain. The chimpanzee shows unmistakable analogies of brain, skull, and face with the makaken, and especially with the magot, and stands in the same well-developed relation to the makakos and pavians that the orang does to the gibbons and baboons. The gorilla is a mandrill by force of similar analogies, by its lack of tail, its breadth of breast-bone, its singularity of gait, walking upon the back or outer side of its two last finger-joints. There has been, then, an unmistakable, threefold, and parallel development of the ape ideal, along three historic lines from three original family groups.* I do not myself see what forbids us from supposing that the process of

* See Schröder van der Kolk and Vrolik's fivefold resemblance in Vogt, ii. 283.

development went on to the production of those human forms of an acknowledged want of beauty and spirituality, of an acknowledged ape-like appearance, which we find populating the very regions of the chimpanzee, gorilla, and orang, viz. the brutal black races of tropical Africa, and the negritos of Anderman and New Holland.

The objection I know is at hand that there are no intermediate forms existing between those man-like apes and these ape-like men. But I think the force of this objection is broken by several considerations. And first, by the consideration that such intermediate forms need not for the sake of the argument exist in masses or tribes. Individuals scattered all over the world, through all the human races, with low foreheads, small brains, long arms, thin legs, projecting tusk-like teeth, suppressed noses, and other marks of arrested development; to say nothing of millions of idiots and cretins produced by the same arrest in every generation of mankind, sustain the argument.

Then, secondly, we must consider that such intermediate forms may have existed in immense numbers and then disappeared, for all we know to the contrary. Nay, multitudes of them may exist in the fossil state still undiscovered. Vogt has well observed that 20 years ago not a single fossil ape had been made out. During these 20 years nearly a dozen have been found. One year ago no intermediate form between the schlankaffen and makaken was known; now we have the whole skeleton of one.* Such intermediate types are continually turning up.

And, thirdly, we must keep in mind most carefully that skulls have been found in caves which would have been undoubtedly assigned to apes had not other parts of the skeleton been found at the same time compelling the anatomist to assign them to some ancient form of humanity; precisely as in the instance of the fossil ape discovered in Greece, by its skull it would have been pronounced a pure baboon, had not its limbs been those belonging to a species of makaken.

And, fourthly, when we compare the cave and lake and diluvial skulls as yet discovered with the skulls of the Australian natives (accepted as the most degraded or apelike

* Vogt, ii. 279.

race now living on the earth), the resemblance in most cases (setting the Engis skull aside) is so extraordinary that we may be reasonably excused for suspecting that the early races of mankind were farther removed in the order of development from the noblest races now existing than the apes are removed from them.

Let us praise God for our place in this procession of mysteries. If natural history should hereafter teach the truth of our descent from these inferior beings Christianity will always teach humility. Let us comfort our pride by remembering that everything has been good and perfect in its day and generation.

LECTURE VI.

ON THE EARLY SOCIAL LIFE OF MAN.

THE tree is known by its fruit. We have been considering man as a *being*; henceforth we are to regard him as a *worker*: first, as a social being, a worker in brass and iron, a maker of boats and bridges, an inventor of weapons, and a framer of laws; then, as an intellectual being, a poet or maker *par excellence*, an artist, a philosopher, a priest.

It is not as easy to distinguish races by degrees of facial angle as by grades of civilization. Perhaps we have a right to say: as only some races of animals are tamable, so only certain races of mankind are civilizable. As the carnivora love blood, and the ruminants and pachyderms love foliage and grass, so do some races of mankind love tents and waggons, while others prefer cities and ships. But after all our efforts to include these social tendencies among the anatomical or physiological characteristics of mankind they recoil upon us as mere harmonies of man with nature. So long as large areas of the earth's surface consist of desert sands or grassy plains so long will there be nomade races to inhabit them; mountains will breed mountaineers; deltas grow cities. The fishing rates do not seek the seashore, they are produced by it. The forest gives birth to the hunter as it does to the deer and wild-boar after which he stalks.

If this be so, and if forests have disappeared from civilized lands by the agency of man, it follows, that when the earliest races of mankind appeared they appeared in the form of fishing and hunting savages, the form most in harmony with the physical condition of the greater part of the earth's surface at that time. There were no doubt **then** as now natural paradises existing here and there

wherein some section of a single race would take on a quicker civilization than elsewhere. But he must be blind who cannot detect the traces of that long, hard, desperate, bloody, cruel, demon-like conflict between the earliest men and all the adverse powers of the air and earth—a conflict in which all the advantage was on nature's side—but the victory on man's, because the genii of mind came to his relief.

All civilization comes of work. The race that will not work cannot get civilized. Yet mere work is not a civilizer. Leisure is indispensable. The French-Canadian works from four in the morning until six and seven at night, but his civilization is not high. Civilization is like navigation. It makes all the difference in the world whether there be a current with you or a current against you. In the tropics and at the poles the powers of nature are too many for man. If he barely sleep he will do well. So also in the early ages, even in the temperate zone, mankind needed reinforcement. The black race which cannot advance under the equator any more than can the pigmy race around the pole, civilizes itself when it is transferred to the 40th parallel of latitude provided there be given to it a chance to work. The progress of the black race in the United States under all its disadvantages has been respectable. Give it the freedom of the plough, the anvil, and the loom, that is the right to enjoy the results of varied and honest labour, and you will give it the enjoyment of so much leisure afterwards as the highest civilization needs.

No race has ever yet consented to work for nothing cheerfully. All the sense of justice man has comes from resistance to that attempt. If the reconstruction of Southern society is to be a success it can be so only on condition that the white man share the soil, the shop, the schoolroom, and the forum with the black. That the black race is willing to buy civilization at its natural price, that is with work, has been demonstrated. But to show you how delicate a test of justice work can be I will tell you a story which a friend of mine, an engineer upon a Southern railroad, told to me.

A railroad was projected through the swamp-lands of Florida. Slaves were hired from the planters of Georgia

to do the work. A day's task for every man was measured with a ten-foot pole. The slaves rose early and by working diligently could complete their tale of work by two or three o'clock and have the rest of the day for their amusement. They soon discovered this advantage and threw their whole soul into the business. Before noon nothing was to be seen but the flying dirt; afternoon nothing but song and dance and general cheer. This was too good to last. The avaricious contractors made new poles, 13 inches instead of 12 to the foot. The day's task was unaccountably lengthened by an hour or more. The blacks could offer no explanation and made no resistance, for the work was still within the range of cheerful diligence. Another month passed by and a third set of poles were distributed. The foot had now become 14 inches long and the day's task lasted until sunset.* The defrauded labourers, seeing that there was no use struggling with an unjust despotism, returned to plantation-habits, shirked all the work they could, lost heart and fell back into that barbarism the essence of which consists in giving up the soul a prey to the forces of nature. The contractors had overshot their mark; and so one of these monuments of the high civilization of the nineteenth century served only to remind the spectator of the aboriginal condition of the races of mankind before they had learned to hope to better their miserable plight.

Rain, hail, and snow, and the furious piercing north wind were the slave-drivers of that age. The perpetual growth of the forest and the rapid increase of wild animals were the measuring-rods which mysteriously lengthened out their task. No wonder that despondency grew out of ignorance, and barbarity out of despair. It is hard to comprehend the possible beginnings of civilization in a wilderness of forests and mountains, pelted with storms and horrible with the cries of wild beasts. Yet such was

* The difference in the tasks, it should be remembered, is to be *estimated in cubic measure.*

One cubic foot	$12 \times 12 \times 12 = 1728$
„ „ measure	$13 \times 13 \times 13 = 2197$, nearly 28 per cent. more than a true cubic foot.
One cubic measure	$14 \times 14 \times 14 = 2794$, nearly 60 per cent. more than a true cubic foot.

Europe down to a recent date, i. e. to within a few centuries of the Christian era. Such was all North America two hundred years ago with the exception of a few river bottoms, a few glades and a few estuary marshes on the seacoast. In Europe also such places early became refuges and nurseries for man. It is therefore in the open plain of Languedoc, on the borders of the delta of the Rhone, and on the great chalk basin of central and northern France and southern England that relics of the most ancient races have been chiefly found. But even here they are commingled with the remains of tigers and hyenas, wild boars and bulls, the bear, the wolf and the deer, and even of the rhinoceros, the hippopotamus and the elephant, in such numbers and of such a size as to tell a plain story of the most savage existence. When we remember that the only weapons which the men of the cave had at their command were fire, and the bow and arrow, the flint hatchet fastened to its wooden handle with a willow-withe or a shrunken piece of deer-skin, or the pike pointed with a reindeer prong or a wild boar's tusk; and that the only farming implement they knew of was a paddle of flint, chipped thin and broad and worked by hand without a handle, our wonder grows how civilization could have found a time and starting-point.

It was no doubt in order to avoid their natural enemies, the wild beasts, and perhaps also to defend themselves against each other, that some tribes whose hunting-grounds lay neighbouring to lakes betook themselves to a peculiar mode of life. They planted upright logs in the lake bottom, supporting them with heaps of stones, and lashing them together with wicker-work. On these they laid a wooden platform communicating with the shore by a wooden bridge or causeway. On this platform stood their wigwams. Here the women and children were comparatively safe when the men were on shore hunting, or farming or at war. On the edges of the platform they sat to fish. In the centre of each wigwam perhaps was a layer of earth to cook their fish upon. Trap-doors in the village floor received the offal, the bones of animals after the marrow had been extracted, fragments of broken pottery, the waste of spoiled nets and ruined weapons. Hundreds of the sites of these villages have

been recently discovered* in the lakes of Switzerland, Bavaria, and Austria, and thousands of such relics of their domestic life, but as yet only two skulls.† It is, therefore, certain, that these people were not habitual cannibals; for in that case human skeletons would be abundant. It is equally evident that they either burned their dead or buried them on shore. That both these customs were pursued at different times we have good evidence. It is remarkable that the oldest skull yet found in these lakewellings presents us again with all the low-type features of the Neanderthal cranium; great ridges over the orbits of the eyes, a suddenly retreating forehead, and extremely small capacity. It contained what seems an undeveloped brain; but yet it could not have been (as some were inclined to consider the Neanderthal cranium) the skull of an idiot. These people were far from being idiots. They were only animals. The essential difference between an idiot and an animal consists in this fact: the idiot, like the unborn fœtus, is not aware of his relations to surrounding nature; his life goes on chemically, not consciously; the animal on the contrary is wide-awake to his position and its demands. Indeed, the quickness and many-sidedness of this self-consciousness is the nicest scale we have by which to grade the animal creation. Behold the deer for instance; how alive to every sound and motion! how skilful to hide! how prompt to fly! And yet I have myself stood for half an hour by my transit instrument in the woods of the Towanda Mountains, waiting until my men cut out a line down the long steep slope into a valley, and during all this time I have seen a deer stand motionless watching the brilliant spot of light which the sunbeams through the trees made on the brass cylinder of my telescope not fifty paces distant, unaware of my presence and unconscious of danger. In vain, says the poet of old, is the net spread in the sight of any bird. The consciousness of its relations is not complete in any

* Beginning with the dry winter of 1853-4, Meilen, on Lake Zurich.

† One (mentioned in Rutimeyer's *Die Fauna der Pfahlbauten in der Schweiz*, p. 181. Basel, 1861), at Meilen, on Lake Zurich, early stone period, called by Prof. His an intermediate type between the long and short-headed forms; and, therefore, not like the small round heads of the Danish peat-mosses; the other found by Desor, 1864, and referred to in the text.

animal; but it is more complete in some than in others. The horse is superior to the deer; yet the horse rushes into not out of a burning stable. The ape is superior to all animals below man, because his powers of observation have more scope, his comprehension of emergencies is more logical; he shows an inventive genius harmonizing with this higher degree of self-consciousness, and hence he more perfectly imitates the brutal customs, the virtues and the vices of mankind. The difference between the ape and the civilized man lies in the limitation of the consciousness of the ape to his physical and passional relationships to nature; while the self-consciousness of the civilized man deals also with the subjects of abstract thought and with the invisible and eternal worlds.* But this is the precise distinction between the cave or lake-dwellers of early Europe and the Londoner or Bostonian of to-day; and thus we are returned once more to the idea of the affiliation of the apes with mankind in the early stages of its existence.

That these old lake-dwellers were in no respects idiotic is evident from the very nature of the case: a race of idiots could no more continue to exist than unborn children could. But their handicraft is still more conclusive evidence. In the museum of M. Troyon of Lausanne I had the pleasure of examining a piece of a door, half-burned, consisting of three boards two of which lay side by side but not rabbited together; the third board crossed the other two at right angles to hold them together; but instead of being nailed or pegged fast to them, it was as regularly dovetailed into them as a carpenter of our days would have done it. I saw also among these curious objects pieces of twisted thread and knotted net. Their clothes were probably of skins, and loom-weaving was as yet unknown, but specimens of plaited cloth have been found. I saw needles of bone to sew with; and pieces of charred baked bread in the form of flat round cakes; and grains of wheat and barley. The small wild apple and pear of the Swiss woods have also been dredged up, wild plum-stones, and beech and hazel-nuts in great abundance.

* I will return to this subject in the beginning of the Tenth Lecture.

How pleasant it would be to have a dinner-scene of those days by Teniers, or a page of table-talk by Coleridge! What a contrast would it present to the Round Table of Arthur and his paladins! or to a *déjeuner* at the Maison Doré in 1865! The table can be seen, with its dish, in the Museum of the Irish Academy; but where are the guests? It was discovered in a peat-bog in County Tyrone, ten feet beneath the surface. The table and the dish were each scooped out of a solid piece of wood, apparently fir. An oblong table, with its ends curved inward, and set on four short legs four and a half inches high, truncated cones connected at their bases by a low rim in which are two cord holes; and an oval dish four or five inches deep, in its edge two holes answering to the two holes in the rim of the table, and probably slung to it on the back in travelling. Beside the dish lay a large heap of hazel-nuts, probably an autumnal hoard just gathered for winter's use. Perhaps they were uproariously enjoying their repast when interrupted by the rush of some carnivorous beast scattering their merriment.*

How long the ages were during which these lake-dwellings were inhabited we do not know. We know that they existed still in the days of Herodotus; and the Swiss antiquaries believe that those of Neville and Chavanues in the Canton de Vaud continued to be dwelt on to the VIth century after Christ. There are sufficient evidences in the articles found to distinguish them as of very different ages. The iron age of the Romans is represented; the preceding age of bronze; and a still more ancient age of stone, perhaps going back to the times succeeding the retreat of the Swiss glaciers. We cannot tell therefore at what time wild apples, plums, and berries were exchanged for wheat and barley bread; nor when the skins of beasts were replaced by plaited cloth. The best scale of years we have is got from Rutimeyer's list of the animals on which these ancients fed, and especially by the marked change from wild to domestic flesh. In all of the lake-dwelling deposits, even the oldest, we find the bones of the domesticated ox, sheep, goat and dog; and intermixed with these in various localities bones of the horse and ass, bones of the elk and stag, the roe and fallow-deer,

* O'Callaghan, Proc. Geol. and P. S., W. R. Yorkshire, p. 315, 1863-4.

the ibex and the chamois, the bison and wild bull, the small swamp-hog and the great wild boar, the wolf and fox, the bear and the badger, the marten, polecat, ermine, and weasel, the otter and the beaver, the hedgehog, squirrel and fieldmouse, the wildcat and the hare, the frog and the tortoise, the wild swan, goose, two kinds of ducks and fifteen other kinds of birds. All that contained marrow are found split open: this is invariably the case with those of the bull and bison. In the most ancient villages, like those of Wangen and Moosseedorf, the evident predominance of bones of the wild stag and roe over those of tame cattle show a decided preference of the chase to a more civilized mode of life; the tame pig is wanting, goats outnumber sheep, the fox was an habitual dish.

When the bronze age opened, the Lithuanian aurochs or bison (*bos bison*, *bos priscus*) ceased to be eaten * and the savages began to tame the great wild bull (*bos urus*, or *primigenius*) which Cæsar describes as still existing in his day, fierce, swift, and strong, and scarcely inferior to the elephant in size; in its tamed state its bones became somewhat less massive and heavy, and its horns somewhat smaller. At this time they added to the common dog, which seems to have been their companion from the beginning, † a new large hunting dog; and with it a small horse, which however must have been very rare among them. By this time the elk and beaver had become extirpated; and the fox had ceased to be a fashionable article of diet.

In looking over this list it seems very remarkable that two animals are absent from it which we should have supposed almost the very first to be discovered. Of the hare only one single fragment of a bone has as yet been found; and we can only explain its absence by Cæsar's account of the holy horror with which the Britons of his day regarded it and with which the Laplanders, who represent the ancient hyperborean race in Europe, still regard it. Of the domestic cat also there is not a trace until we come down to the very youngest villages, those assigned to the VIth century. ‡ And this again is in curious harmony with

* Protected by Czars in one Lithuanian forest, to the present day.

† The oldest of man's gods, the Anubis of Egypt.

‡ Lyell, *Ant. of Man*, p. 26. Desor's *Palafittes*. Smithson, Cont. 1866.

the fact that no trace of the cat exists on the most ancient monuments of Egypt.*

The absence of the reindeer, on the other hand, is merely an evidence of the far inferior antiquity of these lake-dwellings to those remains of man which have been found in the caves of France.

I have said enough to give you a picture of long middle stages in the primeval history of European humanity in Switzerland. But it is necessary to say a few more words about its phases farther north. Let us look for a moment at a more inhospitable region. Let me ask you to keep in mind that in every age, no matter how far back we go, we find men living everywhere; living under different circumstances, but living everywhere. I shall say something in due time about migrations. But I wish you to observe just now that theories of migration are the most unsatisfactory products of science. In days preceding the oldest migrations of which we can obtain any glimpse the entire surface of the earth seems to have been just as completely settled as it is to-day. In the Stone age, while the Helvetian aborigines were plating cloth and cooking domestic cattle on elaborately constructed platforms in the lake-waters of the south a race of *utter* savages were sitting around fires on the shores of the Baltic with not a single domesticated animal to call their own except the dog, and that a smaller species; gnawing the flesh and splitting the marrow-bones of wild bulls now extinct, of foxes, wolves, and lynxes, red-deer and roes; beavers long since extinct, and seals now very rare; with penguins and capercaillies, both now extinct in Scandinavia. But I am wrong to call them *utter* savages, for they had already learned the art of boat-building,† and were bold fishermen, as we can see by the bones of herring, cod, and flounders which are found among the mounds of kitchen trash which line the shores and mark their haunts. But they were not

* Mariette's Recherches. Renan's article in the Revue des Deux Mondes, April, 1865.

† Rude canoes scooped from trunks are often found in British peat-bogs, sometimes with their short clumsy paddles, and in rare instances, a rope of moss or heather, attached to a stone close by, showing the primitive mode of anchorage. A very perfect specimen lately discovered in the valley of the Aire, is in the museum at Leeds. But such canoes are of all ages. (O'Callaghan, Proc. Geol. Pol. S. W. R. York, 1863-4, p. 314.

cannibals. No human bones make these heaps horrible. In spite of the over-confident assertion of Mr John Crawford who said in a recent debate upon the carnivorous Esquimaux that so far as his researches went they were the only exception to the fact that the ancestors of every race of man had been at one time or another cannibals. The occasional eating of human flesh by shipwrecked mariners does not make a British nation a race of cannibals.* Skulls have been disinterred from peat-bogs and from graves believed to be of the same period—which skulls are small and round, with massive bones above the eyes resembling those of the pigmy race of modern Laplanders. The skulls of the bronze and iron ages found in the upper layers of the Danish peat-bogs are both longer and larger, and belonged no doubt to a race that invaded the Baltic regions afterwards.

We have the means at hand for reconstructing in imagination the three different conditions of those northern lands during their inhabitation by three successive races. Taking the last first—in Roman times the Danish isles were covered with a magnificent forest of *beech*, which still exists. This is the tree of the *iron age*. Its logs are abundant in the topmost layers of those peat-bogs which are so numerous in the north, and in which the skeletons of lost men with large *long* skulls are sometimes found with iron arms and implements. Beneath these top layers lie others deeper down, but how much older we know not, the logs in which are all of *oak*. Oak was the forest of the age of *bronze*. In the peat-layers no iron is found, and very few skeletons; because the people of that age *burned* their dead and buried their ashes in urns beneath grave mounds. How many thousands of years this age of oak woods and funereal fires stretched backward we know not. But behind it lie the vaster ages of the stone period. The lowest layers of peat contain neither logs of beech nor logs of oak; their embedded trunks are chiefly of Scotch *fir*.

* Proc. R. Geog. Soc., Jan. 23, 1865. Kane and others have testified to the improvidence of the Esquimaux, and to their actually starving in midwinter when calm weather and the neap-tides permit the sea to freeze over, and the walrus have to seek water in the offing. In 1854-5 they were compelled to eat their dogs, but not a case of cannibalism is known to have occurred among them.—But see facts stated in Lecture X.

The savages of those remote times lived in the true Cimmerian darkness of the pines; and their relics are the long heaps of oyster-shells, cockles, and other edible molluscs, plentifully mixed in with the remains of quadrupeds, birds and fish the catalogue of which I have already given you. Scattered throughout these heaps are found flint knives and instruments of bone and horn, coarse potsherds, charcoal and cinders, but not a trace of either iron or bronze. Yet the polish given to the stone knives and hatchets show that even this ancient age is not so infinitely remote from ours either in time or in barbarism as that of the people of the diluvium and earlier caves, to say nothing of possible relics in the tertiary deposits.*

See how all civilization is relative. As we look down these slopes of a foregone eternity deeps yawn in deeps, in each a deeper still.

See also on what delicate threads of evidence such demonstrations hang. A single herring-bone in a hundred acres of oyster-shells—a single file-scratch on a golden torque found in a Druid barrow, tells the whole story. It is the master-trick of genuine science; Agassiz constructing the whole fish from a single scale; Leverrier detecting the skulking Neptune by a ripple in the orbit of Uranus. But, as I have said already, the method must be sound, the starting-point well known, or the result will be a lie. What I have given you this evening are the well-established and universally accepted results of many years of careful investigation by all the archaeologists of northern Europe, led by such masters as Worsæ, Nilsson, Steenstrup and Thompson, Wilson and Lubbock † and Busk, and with all the resources of geology at their command. Hundreds

* The oyster is no longer to be found in the Baltic shores; and the periwinkle (*cardium edule*) which still grows there is a variety dwarfed by the brackishness of the Baltic water since the ocean was shut out from it by the gradual rise of the Scandinavian peninsula, at the observed rate of two or three inches in a century. The absence from these kitchen heaps of the mammoth and rhinoceros is not so extraordinary as is that of the aurochs and reindeer, for the first two may have become extinct at an earlier period in this latitude.

† See Morlot's Mem. in Bull. Soc. Vaud, vi. 1860. Lausanne; translated in 8th contrib. Smith. Inst., Washington, and abstracted by Lyell in Ant. Man, p. 8.

of peat-bogs have been searched, thousands of tumuli have been opened, miles of shell-heaps have been explored, and that beneath the jealous criticism of all Europe. In the sober judgment of well-informed men this much may be considered settled: that a general advance in civilization is perceptible in the past history of man during what may be roughly stated as the stone, the bronze, and the iron periods, or, if you prefer to call them so, the ages of the pine, the oak, and the beech woods; that the men of the stone age were savage hunters and fishermen, of small stature and low intellect; that the men of the bronze age came in from other lands bringing with them the knowledge of metallurgy, a taste for beauty and religious feelings which led them to burn their dead; and that the men of the iron age were of still another race and country, large of stature, long-headed warriors, with iron swords and iron ploughs, builders of forts and ships, restless invaders, fond of state, accumulators of property, oppressors of the ancient peoples, and the natural progenitors of the Berseckers and Jarl kings who in the years of written history conquered the west and south of Europe and laid the basis broad for the eminent civilization of our modern times.*

Will any one be so far influenced by the prejudices of scholastic education as to insist on a reversal of this order of civil development? Will any one maintain that mankind, although at first created in some Eden a little lower than the angels, full of strength and beauty and endowed with supernatural intelligence, lords of the fowl and the brute, tilling the soil and adorning their homes with beautiful works of art, were nevertheless compelled by wrath divine against a mythical sin to wander out towards the inhospitable north, fell into want and misery and lost their high prerogatives, abandoned their generous habits, forgot their faculties, grew savage, and became at last the wretched outcasts whose remains are mingled with the bones of extinct beasts and fishes of the sea on the Scandinavian shores? Let such a one remember that so far as our knowledge of history goes, so far as all the facts have been

* Nat. Hist. Review, 1861, &c. And two volumes published 1865, 'Prehistoric Times.' Williams and Norgate, Lond. 2 Vols. See 'Westminster Review,' July, p. 126.

collected no single instances of such a degradation can be cited in support of such a theory. Men, so far as we know, have always increased their stock of knowledge and power instead of losing it. The law of invasion has been a law of development. Races have always elevated and ennobled each other. Their wanderings have been like the steps of a conflagration, the farther it goes the fiercer it burns. The Persian love of flowers becomes a national mania when transplanted to the icy banks of the Neva. The smelting of copper once discovered in Armenia could no more be forgotten in Sweden and Norway than the love of Christ can become extinct in California. A race may die out, but not its ideas; except by giving place to truer truths and lovelier lovelinesses. Civilizations to be educated may be forced to make the tour of the world; but they are not rolling stones that gather no moss. The mariner's needle of the distant east may have to wait a thousand years before it finds a box and dial-plate in Italy; but sooner or later it will be rectified for iron ships upon the Atlantic. It may be the year of our Lord 1862 before Blake and Pumpelly shall teach the miners of Japan how to make a blast with their own gunpowder; but do you suppose those islanders will ever, to the end of time allow that splendid trick to be again forgotten? Has not the whole movement of the human race been from the poles towards the equator? From ice and darkness and misery towards the sunlight and the grape? Have we a single fact to show that the movement was ever in the other direction? Science cannot resign to a theological conjecture. Until incontrovertible facts are offered as an argument against it we must continue in our reasonings to follow the course of nature as we know it, and say that barbarism everywhere on earth preceded civilization; and accept the order of the Danish peat-bogs as the symbol of the order of the aboriginal development of the races of mankind.

'As has been truly observed,' says Mr Lubbock in a speech before the R. Geographical Society,* 'man, in the earlier times of which we have any relics, appears to have been not only a savage, but a savage living under Arctic

* Jan. 23, 1865, p. 61

conditions.' Therefore the accounts which Kane and Ross before him have given us of the isolated race of Esquimaux living on the west coast of Greenland between the two great prongs of the Humboldt glacier and so completely cut off from the rest of the world that they would not believe Ross when he said he had come to them from the south—are of surpassing interest to us. These Arctic Highlanders contend with nature for a chance to live under the extremest disabilities. They have no boats, and therefore cannot follow their food when it migrates. They have no fish-hooks, and therefore cannot live on fish. They have neither bow nor arrow, and therefore to them the herds of reindeer which range unmolested on the barren uplands at the base of the great glaciers, the Sernik Soak or great Ice-wall as they call it, which hems them in, are valueless. 'They have never been seen to partake of a single herb, or grass, or berry grown upon the shore,' says Osborne,* 'and of vegetables and cereals they have of course no conception.' No other people on earth are known to be so entirely carnivorous. Kane calls them an expiring race, but he furnishes for the support of this assertion no good evidence. As Ross found them in 1818 Kane saw them in 1854; only they had become friendly instead of being hostile to their visitors. Without driftwood, except a fragment of wreck at rare intervals, and with only a small supply of meteoric iron and a few wrecked iron hoops, they could make no weapons but bone knives, bone harpoons, and bone lances with which they attack and kill white bears and seals and walruses with the help of dogs. With nets they catch in summer vast numbers of the delicious little auk or penguin. They have in use the identical form of skin-scraping tools which have been found so abundantly in the diluvial and cave deposits of Europe, flat on one side, convex on the other, round at one end and pointed at the other. But as supplies of meat in such cold countries can be preserved for a long time we may find in these carnivorous habits of the present Esquimaux a new and more satisfactory explanation of the vast numbers of animal skeletons which are found in the old caves, if we suppose the ancient inhabitants of Europe to have been an Arctic and carnivorous

* Jan. 23, 1865, p. 50.

race.* In spite of all the disadvantages of their situation, 'all who have seen these people describe the men as square built, hearty fellows, deep-chested, bass-voiced, and merry-hearted; and the women, good souls, as tender and sympathetic in their quaint way; for it's not every European mother who would lend a nice warm babe to make a soft pillow for a weary traveller, as the ladies of Etah did; and fair enough to win the hearts of some on board of the *Advance*. Kane's faithful hunter Hans abandoned him for love of Shanghu's pretty daughter, who had nursed him when wounded in a walrus hunt. These people live as far north as 80°, and there are indications that Esquimaux settlements may even be found at the very pole.†

In strong contrast with the well-authenticated, well-compacted, and in all respects sober mass of information which the northern antiquarians have put at our disposal stand the isolated and ill-confirmed reports of tertiary men such as those of the Abbé Bourgeois and M. Desnoyers; and also the extraordinary theories of enthusiasts like MM. Brouillet and Meillet, based upon—mistakes. But when we remember the wild conjectures to which Phœnician letters on the Grave-mound amulet in western Virginia gave rise, and the numerous forgeries of Oriental human relics in our Western States which have been reported from time to time, it is not unuseful to observe how such aberrations may be possible even to the most advanced science of Europe. These gentlemen have lately published an account of certain bone-caves in Poitou ‡ from which they have obtained animal remains similar to those found in

* Kane and others found that the Esquimaux kill the walrus rapidly in the spring, and heap their bodies on the shore, piling rocks over the heap, while they kill more; but like all savages, they are so thoughtless that these *caches* putrify in the summer; for they never seem to think of making them in the ice-caves of the adjacent glaciers. All this proves how tenacious human life is. Kane says that the Arctic winter temperature stood for three months at—60° to 75° Fahrenheit. But human life is tenacious of the earth only where animal life is so; the enormous walrus suckles its young in midwinter at 77° lat.; so do the herds of seals feeding on fish. But the walrus seems to feed on sea-weed alone. At any rate the glacial period in Europe could no more extirpate the cave-dwelling race than the Arctic winters can the Esquimaux. (Proc. R. Geog. Soc., p. 65, Jan. 23, 1865.)

† Reiterated by Mr C. R. Markham, Proc. Geog. Soc., Jan. 23, 1865.

‡ See Westminster Review, July, 1865, p. 121.

other caverns in France, scratched and marked by man. On some of them are Sanscrit letters, not so arranged however as to be pronounceable in words or syllables; and two of them are scratched upon a bone representing a phallus. From these assumed Sanscrit letters they conclude that the cave-people of France were emigrants from Asia; that the written language of Arya was of enormous antiquity; that the probable date of the relics is 24,000 years B.C.; that at that time there occurred one of those periodical cataclysms which desolate the earth and drive the races to and fro; that another, taking place about 14,000 B.C., was the *débâcle* produced by the breaking up of the antarctic polar ice; and that a third was brought about in 2350 B.C. by a similar breaking up of the ice-cope around the Arctic pole.

Unfortunately for this fine theory M. Pictet of Geneva, pronounces that these letters, although actually Sanscrit, have been unskillfully selected from one of the more modern forms of that alphabet! Setting aside however the stupidity of the forgery, the hypothesis judged upon its own merits, *mélange* as it is of scientific and unscientific elements, can hardly hold together long enough for us to look at it. We might almost as well accept the Greek or Hebrew fables of a universal deluge; a phenomenon which we well know to be physically impossible; for the most tremendous rain-fall does not exceed six inches per hour and so completely desiccates the atmosphere that it can last but a short time; whereas, even if it continued in full force for forty days and nights the entire amount would only be some 6000 inches, or 500 feet. If all the aqueous vapour in the atmosphere were to be condensed at once it could not elevate the sea level by 50 feet. Nor is modern science aware of the existence of any 'fountains of the great deep' to be broken up to supplement the deficiency. And if, as some have been willing to suppose, the divine hand could have pressed down some one area of the crust of the earth so as to permit the ocean to rush in and cover it, the only consequence of that would have been to drain off extensive areas elsewhere and thus increase the amount of land left dry.

When we introduce the idea of cataclysms therefore into ethnology we must carefully limit their magnitude

and define their causes, wholly irrespective of the fanciful or allegorical stories of the ancient poets; remembering moreover how the ignorance of men predisposes them to enlarge and dignify their personal and local misadventures into universal disasters to the human race.

Too great a cataclysm would extirpate nations instead of transferring them from one domain to another. We must lessen the cause if we wish to produce the required effect. Had the melting of the Swiss glaciers been the sudden result of the instantaneous emergence of the Sahara desert and the immediate creation of the Sirocco winds the aboriginal population of Europe would have been swept by a double deluge into the surrounding seas. But, as we know, the African portion of the ancient Mediterranean was cut off from the European portion of it so slowly by the gradual accumulation of gravel bars between the Carthaginian and Cyrenian coasts, and the drying up of the African waters must have been a process so deliberate and so apart from any noticeable change of level as to land and sea, that the melting of the glaciers may have occupied the lifetime of a generation of cave-dwellers, and produced no change of climate nor of soil to which they were not amply competent to adapt themselves.

Truth needs a good perspective. A hill looks always steeper from its foot or from its summit than when we are upon its sides. So the foreshortening of time, regarded with a backward glance, piles up the thousand minor incidents of some slow change into one mighty crisis, and we stand amazed and terrified at the possibility of the recurrence in our day of what were it really to happen would no more trouble us than any of the ordinary common-place experiences of life.

It is not a general deluge then, it is an ordinary inundation which mankind has to fear. A freshet, as we call it, a famine, a pestilence, a murrain in their flocks and herds, the loss of timber by the conflagrations of a year of drought—these are real cataclysms of human history; producing poverty and desperation, exciting insurrections against established governments, bursting into a blaze of civil war, and ending with the expulsion of the unfortunate to seek and settle upon other lands. When once the impulse is established in some distant and perhaps unheard-

of portion of the population of the world it propagates itself from tribe to tribe and from race to race, those behind precipitating themselves upon those in front, and those attacking having the usual advantage over those attacked, until a whole continent is ethnologically shifted forward one degree, while some pre-eminently vigorous stock may have even penetrated through half of the moving mass and planted itself in the very heart of an entirely alien race. Such was the case of the hyperborean Hungarians, now surrounded by Slavonians; and such was every way the case with the establishment of the Vandals in northern Africa, of the Saracens in Spain and southern France, of the Turkomans in Greece, and of the Hyksos in ancient Egypt, who probably crossed, like the Turks of modern days, the whole of central Asia, from the northern borders of the Chinese empire.

We are too apt to regard political revolutions as the work of politicians. Far from it. Websters and Calhouns are merely maggots in the fermenting cheese, bred of it, and feeding on it, but not much more than illustrations of its liveliness. We must find the causes of political revolutions in the masses of the people. Fat folks love ease and hate the clash of arms. The wolves of the Pyrenees descend into the villages not until they are gaunt-ribbed and hollow-eyed with famine. Throw multitudes out of employment,—it is like dipping a handful of cotton-wool into sulphuric acid; you turn it into gun-cotton, and any spark will explode it so as to tear your hand in pieces. Thus are governments destroyed.

Look at any good chart of the region of China around the capital city of Pekin. You will notice there the course of the mightiest river in the world, the Yellow River, Hoang-ho, which drains the central parts of Asia. You will notice also a range of mountains (running north and south directly in its path to the gulf of Pechele), which one of our geologists, Mr Pumpelly, believes to have been elevated at a recent date. Through this range the river once passed directly to the sea by what is now the bed of another river, the Pei-ho. But by a subsequent re-elevation of this mountain-chain the great river, turned at a right angle southward, has been compelled to seek along the western foot of the ridge its passage 350 miles farther south

than the gap through which it used to go before. Here it turns east, goes through, and takes its unobstructed way to the Yellow Sea. The country between the mountains and the sea is a low plain traversed by numerous ancient river-beds, a vast delta which the river has been slowly and steadily reclaiming from the ocean for no one knows how long. In old Chinese municipal records many of the ancient cities which now stand miles and even leagues back from the shore are described as seaports with good harbours when they were first built. You will also notice a high mountainous promontory projecting from the middle of the delta into the sea; this was an island once. The delta has been formed around its western end by the Yellow River changing its bed alternately to the right and to the left with a motion precisely like that of the head of a silkworm when spinning its cocoon. At the last meeting of the National Academy at Northampton, Mr Pumpelly exhibited a chart of this delta, constructed for him by a learned Chinese scholar whom he employed to search the historical records of the province, so that he could lay down the different courses which the mighty stream had taken under the different dynasties of Chinese emperors, debouching alternately on the two sides of the central promontory. There is a Chinese story, that after a deluge which destroyed mankind the great king, Yû, first emperor of the first dynasty, B.C. 2100, built dykes to confine the river to its then existing bed. This care of the Yellow River became the hereditary policy of all succeeding emperors, a *sine quâ non* for any dynasty however powerful. For, as the river filled up its bed until its surface level stood 50 and 60, and as the Jesuits say even 90 feet above the surrounding country, the least remissness threatened incredible calamities. The delta was exceedingly fertile; its population was the densest in the world; its level surface could afford no shelter from destruction were the banks to break; flight might save individuals but in a state of utter destitution, for the highlands were a hundred miles away; the flocks and herds would surely perish; and the river, swollen for the occasion, would plough a broad, deep avenue of annihilation through the sites of towns and cities to its new mouth upon the farther side of the peninsula. In the face of all these terrors, and they

were no imaginations, for they had been repeatedly realized, the government officials would periodically grow careless and venal; the misappropriation to themselves of taxes levied to keep up the banks allowed those banks to become slowly weaker at every point, until some winter of uncommon snow upon the mountains would be followed by a late spring of uncommon heat; the river would suddenly overtop its insufficient banks and spread destruction over the whole delta. The destruction of life alone, to this over-populated region, although appalling, would be rather a blessing than a curse. English ships have been known to steam up all the way from Whampoa to Canton through a sheet of dead bodies like drift ice after such an inundation of the Canton river. But the worst terrors of the event lay in the millions of unburied, putrifying corpses covering the fields; the starving myriads, women and children; and the desperate ferocity of armed brigands, wifeless, and childless, and houseless, and landless, and moneyless, moving from the scene of wrath and woe outward in all directions to spread disturbance through surrounding provinces. To suppress these armies of vagabonds armies of regulars and volunteers had to be employed, which only increased the evils of the land. Continual fighting turned the robbers into warriors, and the imbecility of the decaying dynasty which had been the original cause of failure in the river-dykes, became now the cause of its military overthrow. The records of China show that these changes in the course of the Yellow River, happening at regular intervals of three or four centuries, have corresponded with as many imperial revolutions. We need not doubt that some of these revolutions, commencing at the Yellow Sea, have set in motion waves of war and wandering which never stopped until they broke upon the Atlantic coast.

But we are not to think that a millionth part of the water follows the wave. The form advances, but the equilibrium must be maintained. Persons, families, armies migrate; but not the race. Were this not true we should see to-day the cat-eyed Mongol tethering his horse on the lands of western France. Hang up a row of ivory balls; strike the first one; what happens? Do they all rush forward in a heap? No, the last one only flies; the rest

remain in place. Thus the races of mankind have in the main retained their original seats by virtue of an elasticity inherent in all organized society even of the lowest grade; yet propagating tidal waves of agriculture, commerce, mechanics, arts, politics, and religion from east to west, fusing the different races practically into one.

There are other less striking but more powerful physical causes of the out-wanderings of races; such as the change of fertile countries into deserts, or of salubrious into pestilential air. But the physical sciences have not yet made these causes indisputably clear, and history has not preserved sufficiently plain records to enable us to judge of the events. Two instances of such, however, may be cited as well worthy of consideration.

There is a range of desert country stretching across the map of the old world from the Atlantic shores of northern Africa, by Egypt and Arabia, Persia and Independent Tartary to the Chinese Wall. Its drought and consequent sterility connect themselves with certain grand and constant currents of the atmosphere; as also do those similar but more restricted deserts lying on each side of the Andes and the Rocky Mountains in America.

But the removal of forests also has much to do with the production of desert lands; for the forests modify the rain-fall. The Kalahari desert in southern Africa is gaining in extent, its rivers drying up, as Mr James F. Wilson says, because of the indiscriminate felling of timber by the natives and colonists combined; the land once occupied by the frugal, thrifty Hottentots is now possessed by wasteful Caffres; and iron axes are in everybody's hand where formerly an iron axe was a great rarity. Thus even an improvement of the highest value in the arts may give occasion for a fatal wrong to a portion of mankind.

Mr Cyril Graham has shown that the anciently populous region of Hauran, to the east of Damascus, full of the ruins of great cities, became the uninhabitable desert it now is from the same cause. Generals Humphreys and Abbot of the United States army have demonstrated in the case of the Mississippi what Sir Roderick Murchison asserts of the Volga, that its volume of water has diminished by the settling and clearing of the upper country. The French revolution let loose the axe in the Pyrenees, and

the people were fast turning the south of France into a desert, when Napoleon restored the ancient law to protect the woods. Colonel Balfour has shown how the replanting of trees in India has re-opened its lost springs. Lord Stratford de Redcliffe tells us that after speculators had obtained permission to cut the forest of Belgrade the contract had to be annulled; for the reservoirs at Constantinople in consequence began to fail.* How much of the spread of the Arian race was due to the formation of the Persian deserts, and that of the Hebrew race to the new sterility of Syria and Palestine, are curious questions for the cultivators of almost every branch of physical science to take some part in settling satisfactorily.

There is still another class of causes affecting the migration of races to illustrate the nature of which it is only needful to refer to the alleged destruction of the Indians of the United States by a universal pestilence previous to the appearance of the English colonists at Plymouth Rock; and to that less apocryphal destruction of the same ill-fated race subsequently by syphilis and smallpox and scarlet fever and fire-water imported among the tribes from the homesteads of the whites.

But as nature never repeats herself, so every migration that has ever taken place in history, or before history, had features of its own; varying as it did from all others in its force and velocity, in its brilliancy, in its scope and outspread, in its influence for good or evil, and therefore in its consequences at the present day.

From the background of written history, two great migrations stand out pre-eminent—one which affected the religious development of the human mind, and one, in-

* Proc. R. Geog. Soc., p. 106. May, 1865. Dr Livingstone, however, has refused his assent to this explanation. He vouches, indeed, for the facts, and gives instances of the drought of springs in his own garden, and names old water-beds, now dry, still called 'rivers' by the natives; but he ascribed the phenomenon to the rise of the western edge of the continent to a higher level above the sea, and to the production of fissures, like that of the Victoria Falls, draining interior lakes, changing their levels, and making humid winds dry. Dr Kirk objects that wood in Central Africa is abundant on the Zambesi, and that there is an average amount of population, but insufficient to extirpate the forest, only using wood for fuel. He is, therefore, inclined to ascribe the dryness of Southern as well as Northern Africa to atmospheric currents.

augurating the new era of universal liberty and Christian philanthropy :—the migration of the Abrahamic race into Palestine, two thousand years before the advent of Christ ; and the emigration of Anglo-Saxon colonists to the New World and to Australia. Of the latter it is not here the place to speak ; but the other is more closely connected with our subject as it relates directly to the earliest civilization of the globe. I do not myself believe with entire confidence in the personal existence of the Jewish patriarchs. For you will find in the old Hindoo mythologies the names of Abram, Isaac, and Judah ranged in a similar order and connection. Brahma's son Ikswaka was the great-grandfather of Yadu.* The Hebrews of Palestine were but a single twig of that wide-spreading branch of the Shemitic tree which had its original seats in central Asia, and migrating southward and westward over Persia, Mesopotamia, Arabia, and Syria entered Egypt under the name of Hyksos. We read in Genesis that Abram came from Ur of the Chaldees, which all the Fathers have considered to be Edessa or Orfa in the western division of northern Mesopotamia, nine miles from the Euphrates,† but which the excavations of the British consul, Mr Taylor, have shown to be in the south, near the junction of the Tigris and Euphrates.‡

We are also told in the book of Numbers (xiii. 22) that Hebron, the city of the Hebrews, and the head-quarters of the Abrahamites, was built by them seven years before Zoan, or Tanis, in Egypt, where are now to be seen the masterpieces of Hyksos architecture.

You remember that Isaac had a legendary brother Esau, the father of the Arabian nomades.

We must not judge this people by the Jew sutlers in the army of the Potomac ; nor by the three-crowned hatpedlers, crying 'O'Clo!' along the slums and stews of

* Icswaca, Surya (the sun), Soma or Chandra (the moon), Yadu (Judah), Chahuman, Pramara, &c. Ant. Radjpoor MSS. A Sanserit edition gives Ieshwaca, Soma, Yadu, Pramara, &c. MSS. Index, H. 20.

† Callirrhœ in Pliny, v. 21 ; Antiochia ; Justinopolis ; and supposed to be the ARK (ereek) אַרְכָּ of Gen. x. 10. Two days' journey S.E. of it is Charra (Harran), the אַרְכָּ (Harran) אַרְכָּ of Gen. xi. 31, xii. 5, xxvii. 43, xxviii. 10, xxix. 4 ; 2 Kings xix. 12 ; Isaiah xxxvii. 12, and Ezekiel xxvii. 23. Here Crassus was defeated.

‡ Proc. Geog. Soc. 1865, Jan. 9, p. 39

London. We must seek it in its native place, where it is a king. Not crouched against the walls of the mosque of Omar at Jerusalem, but on horseback in the desert, swinging the scimitar or hurling the lance of the Saracen; or in the professor's chair at Cordova, translating, expounding, and enlarging all the philosophies of foregoing ages. We must regard those fine processions of tall, grave, long-robed merchants, entering the villages of Liberia and Sierra Leone; each man a judge of righteousness, incapable of levity or meanness, noble in speech and conduct, and propagating the faith of Islam to-day with the same zeal with which their fathers fought for it a thousand years ago. Study the Arabs in the Indian Ocean, on the islands of Java and Sumatra, surrounded by other races—Malays, Hindoos, Negroes, and Chinese—and you will not only acknowledge their superior blood, but remark their consciousness of this superiority. To this Arab or typical Hebrew Shemite the old prophecy gives the tent; and the Hamite and the Japhetite are to come into it to serve him. Arabs are the commercial masters of the tropics. Hebrews rule the politics of every government in Christendom by slips of paper from their counting-rooms. They have stamped their religious conceptions upon the written history of half the globe. They have afforded to the world its noblest thinkers, its grandest poets, its most fiery orators, its sweetest musicians, its largest-minded merchants, and its most absolute martyrs to patriotism and conscience. Whence came then this grand race, and where did it make its first appearance in history?

The recent discoveries of M. Mariette, perhaps the ablest and most successful of all explorers in the valley of the Nile, have conferred upon ethnology two inestimable boons. First, he has opened up a world of monuments relating to a part of Egyptian history about which we knew nothing, and the most interesting part of all—the earliest. And secondly, he has dispelled the last shades of doubt which hung about the authenticity of Manetho's lists of kings. His discovery of the monuments of the early Memphite dynasties will become important to us hereafter when we discuss the architectural ideas of the earliest men.

But the second point is of importance here. For M.

Mariette, by placing it beyond dispute that the list of Egyptian dynasties and kings which Manetho gives us is not only genuine but constructed in the ordinary manner in which all governmental or official lists are constituted, viz. by taking only the legitimate sovereigns of the whole realm, and each one only for that time during which he reigned the acknowledged legal monarch — has put an end to all attempts to shorten the Egyptian chronology upon the supposition that many of Manetho's kings and even dynasties were contemporaneous — attempts made of course solely in the interest of the Rabbinical age of the world. The 6th dynasty, for instance, it was long supposed reigned at Elephantine in southern Egypt while the 7th was reigning with independent powers at Memphis in the north. But M. Mariette has disinterred monuments of both those dynasties on the sites of both their capitals, viz. at Elephantine in Upper Egypt, and at Sakkara near Memphis at the head of the Delta. Each dynasty therefore must have ruled over the whole kingdom; and consequently the two dynasties could not have been contemporaneous.

In like manner the 13th dynasty which had its seat at Thebes must have preceded the 14th dynasty which had its seat at Xoïs, because from the colossal statues of its kings discovered at Sân near Xoïs it must have reigned there also.

For 1700 years before Christ, that is, from the end of the 17th dynasty, that of the Hyksos, onwards, the history of Egypt is well known; and in all this length of record Manetho has been found correct; he has not doubled any reign by inserting a contemporaneous ruler before or after it. We have no right therefore to suspect him of having committed this blunder in the earlier portion of his list. But such a blunder could only be intentional; and he could have had no prejudice to serve by such a wilful sacrifice of truth in favour of a *long* chronology. His reputation is but just recovering from the load of obloquy which the Jews and their disciples the Protestant chronologists have heaped upon it, for no better reason than that they think they must make the history of all nations upon earth draw up its knees to lie within the child's cradle of the Hebrew scriptures. Father Jerome tells us how the

Rabbis of Tiberias doctored these Hebrew scriptures by slipping back the birth of the firstborn of each of the antediluvian patriarchs one hundred years upon his father's life, in order to bring the birth of Christ at the year 4000 of the world's creation, instead of at the year 6000. He tells us that their motive was to take the millennium argument out of the Christians' mouths. For the early Christians claimed against the Jews that Jesus must be the Messiah because he had come according to prophecy current among the Jews themselves at the dawn of the great Sabbath, the seven thousandth year. When we reject Manetho's list we do it in behalf of the Jews who chuckle at our simplicity; and we do it also in the face of the old Greek version of the Hebrew scriptures, the chronology of which is 2000 years longer than that of King James' translation, showing us how the trick of the Jews was played.

One of the most satisfactory evidences we have that Manetho did not double either his dynasties or his reigns is the fact that the hieroglyphic lists of kings, especially the new list lately discovered at Abydos, contain a multitude of kings' names which do not appear on Manetho's list at all.* During the rule of those fierce strangers, the Hyksos, there were several native dynasties maintaining a precarious existence in various sections of the valley of the Nile; but the great historian, true to his principle that kings *de facto* were the only kings *de jure*, refuses to insert in his list the names of these little native pretenders; he engrosses only the names of the Hyksos monarchs although foreigners and tyrants in his list of the 17th dynasty, because they really reigned.†

A learned lady of England has exerted herself to prove

* Consult not only Manetho, but Eratosthenes, and the tablets of Abydos, of Thebes, and of Sakkara, and the papyrus of Turin. The grand temple at Abydos just discovered by Mariette, presents a new list, analogous to those we have already had, but admirably preserved. It is of the time of Sethos I., 1400 B.C. Sethos has selected 77 names of predecessors to make up his list, which ends like those of Manetho, and the Turin papyrus with Menes and Atothis. Touthmes III. (1500 B.C.) makes offerings to 61 predecessors, on the tablet in the Imperial Library at Paris (Renan).

† Renan, *Révue des Deux Mondes*, April, 1865, p. 664. Mariette's *Aperçu*.

that these mysterious intruders into Egyptian history, the Hyksos, were the same people who are called in the early Hebrew writings the Susim (Hak-Sus, meaning 'king of the Susim'), a mighty nation first heard of as inhabiting the Hauran country, south of Damascus, and east of the Upper Jordan. Whether this be true or not, the first appearance of these nomades seems to be described upon the walls of the tombs of Beni Hassan, built under the 12th dynasty, nearly 3000 years B.C. There the traveller beholds for the first time the pictures of processions of patriarchs with great eyes and aquiline noses,* coming with their wives and little ones, their poor utensils and instruments of music, to request the governor of Egypt to give them lands to dwell in, to escape a famine in their own. It is the story of Abraham, Jacob, and Joseph told by Egyptians; the first pacific modest appearance of that terrible race which was to throw all Asia afterwards into disorder, take possession of the land that succoured it and finally give the human race the grandest, the holiest and the most enduring part of its history.

The distinguished Egyptologist, Dr Brugsch, and an advocate for the authenticity of the Mosaic account of the Exodus, states the accordance of the monuments with that account in a much better and more conclusive manner than Hengstenberg has done, and introduces into its scenery fresher tints. One chapter of his charming little book *Aus dem Orient* is entitled 'Moses and the Monuments,' and in this chapter he resumes all that the hieroglyphics are as yet known to teach about the Hebrews. Tanis, the Hyksos capital, called hieroglyphically HAUAR, Avaris, was besieged and taken by the first king of the 18th dynasty. Its Pharaohs effected the conquest of Asia, planting their furthest triumphal obelisks on the borders of Armenia, and returned with armies of captives to build innumerable monuments along both banks of the Nile. Pictures remain

* But the Hyksos are described as red haired and blue eyed, which gives origin to the theory that they were the earliest appearance of the Gothic or Scandinavian race of the Iron age. Renan remarks that the Hyksos monuments are at Sân, Tanis, or Zoan, זַעַן נַצְרַיִם, which was founded seven years after Hebron, according to Numbers xiii. 22. Hebron was held by אַחִימֶן (AHIMN) שְׁשִׁי (SSI) and תְּלִמִי (TLM) the sons (ילידי) of Anak (הענק). Here again we have Susim.

to us of these captives drawing water, treading clay, spreading out and piling up their tales of bricks to build a temple with, under the supervision of Egyptian figures armed with rods. The 19th dynasty had for its first three kings, Ramses I., Seti I., and Ramses II., the great Sesostris, who reigned 66 years, and pushed his conquests north, east, south, and west. To guard his frontier against the Hittites of Palestine he forced his native Hyksos serfs and foreign military slaves to build a chain of forts across the isthmus of Suez, of which the principal were Ramses and Pithom (Pachtum, Pelusium), names mentioned in Exodus i. ii. as built by Hebrews under the tyrannical oppression of a Pharaoh (Theban PER-AA, Memphite PHER-AO, means high house, or sublime porte), who knew not Joseph. One of the papyri of the British Museum, of the date of Ramses II. (1250—1300 B.C., Anastasi, iii. p. 1) is a description, by a scribe named Pinebsa to his master Amenemaput, of the aspect of things in and around the new city Ramses,—of the entrance into it of the great Pharaoh,—and of the petitions for relief against their overseers, which they thronged about him to present. Another papyrus reads: 'Sum of buildings 12, by people brought from their residences to make brick in the city; they made their tale of bricks daily, without stopping until finished. Thus the task given me by my master has been accomplished.' These conscripts were not Egyptians; they were called APURU, Hebrews. They are often mentioned on the stones and in papyri as at work, guarded by Mazai, the Libyan gendarmerie of Egypt. In a papyrus of the Leyden Museum, an employé of Ramses II. Kautzir, reports to his upper scribe Bakenptah: 'May my lord be pleased with my execution of his assigned work, as follows: distribution of food to the soldiers, and to the Hebrews dragging stones for the great city Ramses Meiamoun the truth-loving, under the oversight of police chief Amenan. I gave them food monthly, according to my master's excellent arrangement.' A second papyrus in the same museum is written by one Keniaman to his superior, the Katena or general Hui: 'I have fulfilled my lord's orders to give food to the soldiers as well as to the Hebrews who drag stones, &c.' In the rock valley Hamamât, along which the great commercial route of Egypt from Coptos

on the Nile to Berenice on the Red Sea, is an inscription describing the quarry work done by 9000 men, among whom was a squad of 800 Hebrews under escort of Mazai police, who had brought the poor devils probably all the way from Goshen in the Delta.

Now if the Hebrews' story of their own wrongs and of their deliverance is to be believed, we must suppose Joseph to have come down into Egypt under one of the Hyksos kings of the 17th dynasty, a Shemite like himself. When the native Pharaohs suppressed the Hyksos government they oppressed the Hyksos colonists who remained forming perhaps nearly the whole population of the eastern wing of the Delta. Moses was born say in the sixth year of Ramses II., 300 years after Joseph's day. In his tenth year Ramses entered his new city, built with Hebrew hands. Add to the remaining 60 years of his reign the 20 years which his son Menephtha reigned, and we get the 80 years of age which Moses had when he led his people forth.

Ramses II., like Cæsar and Napoleon afterwards, was always in trouble, sitting on a throne planted over mines which any moment might explode. He made an 'extradition treaty' with Chetasar, king of the Hittites, who bound himself to return to Egypt all fugitive Hebrews found in Palestine; and the same fearful policy might have actually gone the length of an edict of universal male Hebrew child-murder in view of the eventuality which the Hebrew Scripture thus expresses: 'for when a war arises, they may join our enemies and fight against us, and escape out of the land.' Ramses and his successor added to this fierce oppression a religious seduction; they instituted an ostentatious worship of the sun-god Baal of the Shemite race. Ramses presented his own colossus (now in the Berlin Museum) to the temple of the sun in Zoan, where, says the poet of Psalms lxxviii. 12, 43, Jehovah (by Moses) 'showed his wonders.' Menephtha built no temples, but inscribed his own name on his fathers' monuments with the title 'Worshipper of Sutech-Baal of Tanis,' and cut the image of Baal on the back of one of his own colossi with the figure of his son worshipping before it.

The name Moses is now identified with the Egyptian MAS or MASSU, meaning 'the child,' a name borne by many

personages of that age, one of whom is entitled on a monument of the reign of Menephtha 'Viceroy of Ethiopia;' and this inscription probably gave rise to the assertion of Josephus that Moses, when a young man, led an Egyptian army into Ethiopia to besiege Meroë and married the princess Tharbe out of gratitude for her assistance in entering that city. The Hebrew story makes him the adopted son of Ramses' daughter, and says that he was learned in all the customs of the Egyptians, as in fact might be inferred from the Hebrew ceremonial which bears his name, and the restricted monotheism which idealizes all the writings going by his name; for in the roll of the dead deposited in Egyptian graves God is not named, but only designated as the NUK PU NUK, 'I Am what I Am,' precisely the title 'Jehovah' of the Pentateuch.

At this point, however, all alliance between the monuments and the Mosaic story ceases. Several centuries elapse before the Sheshonk of the 22nd dynasty appears in Hebrew history as the Shishak who besieged Jerusalem. Of the Exodus, of the wanderings in the wilderness, of the settlement in Palestine the monuments say not one word. Coming directly from the land of hieroglyphic writing upon stone, and learned in the art,—leading a people who had not only had memorial sculpture before their eyes all their lifetime, but had themselves built up the walls and set the statues, steles, and obelisks which bore descriptions of every public event, is it not an incredible supposition that Moses should have wrought such wonders, traversed such a length of route, encamped beneath the granite cliffs of the peninsula, and in the defiles of Mount Hor so many years, without leaving a trace of his existence, a line of writing, a letter, a scratch to authenticate his story, not even the two tablets on which he is said to have inscribed his decalogue! There are thousands of rude figures in the valley Mokatteb, and in other ravines descending from Mount Serbal, and they have been studied carefully by a multitude of scholars, under the strongest temptation to make them out Mosaic, but it has not been done. No Egyptologist can speak with patience of Mr Forster's book.

Our faith is always in degrees. We believe in Alfred more than in Arthur,—more in the Gracchi than in

Romulus and Remus. *Time* and *distance* have great dominion over historic faith. Alexander is to us a real personage; we believe in Socrates not quite so clearly, but yet more confidently than in Lycurgus; in Lycurgus more than in Cadmus; in Cadmus more than in Hercules; and not at all in Jupiter and Semele. But time is but a single element in the constitution of the credence that we give to past events, and not at all the most important one; otherwise Ramses II. would not be to the mind of scholars of the present day as solid a reality as Cæsar or Napoleon.

Time goes for nothing when we have *contemporary documents*. These are the legitimate masters of our faith. In their absence there must always be more or less of anarchy in history, more or less doubt mixed with our faith. Ramses as Sesostris, that is, before his monuments were discovered, was the fanciful hero of a Greek fable—quite on a par with Hercules. The traveller who deciphers Bonivard's signature on the stone column to which he was chained in the Chateau of Chillon,—or the half-finished couplet of Byron at the top of the Giralda of Seville,—who stands alone in the desert of Murgab, before the marble fragment which bears the winged relief of the old Persian king and reads the words: 'I am Cyrus the king, the Achæmenian,'—or who catches a glimpse of some noble record in the valley of the Nile, such as that of the ancient governor of Lycopolis: 'Never have I taken the child from the mother's breast, nor the poor man from the side of his wife,'—he feels the full meaning of the term *contemporary testimony by means of monuments*.

But there is a third element of history which regulates the other two, and by which we criticise and limit the value of contemporary monuments,—it is the *vraisemblable*. A tale told by the mountain (TEL) itself cannot be believed unless it represents events as flowing in that self-same current of the *commonplace* in which our lives flow on. The essential sameness of the manners and customs of mankind—the long-enduring unchangeableness of the social life of man—the steadfastness of man's relationships to nature—must not be violated, or we cannot believe. Even when Sesostris was a myth like Hercules there was this difference: the story of Sesostris was extraordinary but probable were there but records left; but that of Hercules

would be incredible however many monuments were left.

Now, judging the Mosaic story by these canons, in which all agree, we find it of an age far antedating all precise history,—we find it utterly unsupported by contemporary monumental records,—and we feel it to be a splendid series of incredibilities from first to last. His birth, his miracles, his exodus, his converse with Jehovah, and his mysterious disappearance,—all stamp the history with an indelible character of myth which not a single discovery of any branch of science has yet repaid the endeavour to efface.

In less degree—in a far less degree—but still in essentially the same mode the legends of the Jews of a date previous to the reign of Solomon are utterly unhistorical, although the stories of the Judges are probable enough. Nothing prevents us from identifying the Hebrews of the monarchy as descendants of the Hyksos race, nor from supposing that the Mosaic records were inventions of a later age, based on a mixture of Hyksos traditions, Arabian poetry, Zoroastrian mythology and genuine Egyptian and Assyrian monumental history. Nothing prevents us from concluding that the Egyptian inscriptions record merely a local and temporary eddy through the isthmus of Suez of that master flood of migration which, starting from the centres of Arianism about the Hindu Koosh in Afghanistan, and allying itself originally with the movements of the Children of the Sun and the Children of the Moon in north-western India, spread itself over Palestine and Syria and Arabia, and then through the dispersion of the Jews into all the countries of the modern world; a migration which, as I have said, is the most important of all that have occurred since man was placed by his Creator on the earth.

But in an anthropological sense the history of the Hebrews is of far inferior importance when compared with that of the early Egyptians, for of this last we have a world of contemporary documents and therefore the most precise information. It is to the earliest monuments of Egypt that we must turn for pictures of the social state of a race of men standing in the boldest contrast with all that we know by inference from the relics of the diluvium and the cave deposits and the palafittes of the social state of far more ancient and more savage races, living under less

CHART OF EGYPTIAN HISTORY.

ANCIENT EMPIRE: lasted 1940 years (? Manetho.)

Thinis Dynasty	I. Menes.	} Pyramid of CochoMé.
Thinis	II.	
Memphis	III.	} Monuments rare. 769 years.
Memphis	IV. Cheops.	
Memphis	V.	Pyramids. Mt Sinai (Wady Magara).
Elephantine	VI. Nitocris;	Tombs at Saqqara.
Memphis	VII.	Apappus.
Memphis	VIII.	} Monuments wanting. 436 years. Egypt perhaps overrun by foreigners. The end of the old writing, religion, civil service, &c.
Heliopolis	IX.	
Heliopolis	X.	

MIDDLE EMPIRE: lasted 1361 years (? Manetho).

Thebes	XI. Entef, Mentouhotep.	} Beni Hassan. Lake Mœris.
Thebes	XII. Osortasen, Amenemba.	
Thebes	XIII. Nofrehotep, Sebekhotep.	60 kings, 463 years.
Xosi	XIV.	Nothing known of this. At its close commenced
Entef	XV.	invasions of the Hyksos, lasting 400 years;
Entef	XVI.	ended with the establishment of the Hyksos.
Sân	XVII. Saïtes (HYKSOS).	Colossi. Sphinxes.

CLASSIC EMPIRE.

Thebes	XVIII. Amosis (Ahmes). Amenophis. Thoutmes. Queer Hatasou. Thebes illustrated. Asia conquered Sun worship introduced by Khou-en-aten.
Thebes	XIX. Ramses I. Scti. Sesostris (Pentaour). Menephta
Thebes	XX. Ramses III. (Sea fight.) Asiatic influences.
Thebes; Sâh.	XXI. Priest dynasty at Thebes. Manetho's kings at Sâh.
Tell-basta	XXII. Sheshonk (takes Jerusalem): Egypt a part of Asia.
Sân	XXIII. Twelve barons divide Lower Egypt. Upper Egypt becomes a province of Soudan.
Saïs	XXIV. Bocchoris, reigning six years, the only king.
	XXV. Sabacon (Cush) conquers Egypt. 50 years. Tahraka.
Saïs	XXVI. Psammiticus, the Libyan? Greek mercenaries. Periplus of Africa. Canal of Suez reattempted.

PERSIAN, GREEK, AND ROMAN EMPIRES.

	XXVII. Cambyses. Darius. 121 years.
Saïs	XXVIII. Wars with the Persians.
Mendes	XXIX. Wars with the Persians.
Sebennytes	XXX. Nectanebo I. Last king expelled by the Persians
	XXXI. Darius III. Six years.
Alexandria	XXXII. Alexander I., II.
Alexandria	XXXIII. Ptolemies, Cleopatra, Berenice, Arsinoë.
Alexandria	XXXIV. Roman proconsuls.

favourable auspices for health of body, peace of mind, and growth in human culture. This picture I will now endeavour to place before your eyes.

But to make the matter as plain as possible I must put it in a graphical form and show by a chronological chart the true relationship in point of time between the Hyksos episode and the beginnings of Egyptian civilization. This chart will show the four great empires of Egypt, beginning with that of the Pyramids and ancient tombs of Memphis, 5000 years B.C. And you will notice at a glance that the 17th dynasty, that of the Hyksos, comes midway in the column between the time of that ancient empire with its oldest of earthly monuments and our own day. Perhaps 3300 years preceded the fall of the Hyksos dynasty, and 3500 years have succeeded it.

Such has been the history of Egypt. Seven thousand years have passed since the fourth king of the first dynasty built the first pyramid of Cochemé, the first which greets the traveller going forth into the desert from the gates of Cairo.* Yet, even then, Egypt was an old country; its people civilized; its architecture grand in idea and perfect in execution; its statuary as natural as any group of Rogers' statuettes; its language not only formed but reduced to writing; its agricultural life rich with oxen, asses, dogs and monkeys, antelopes and gazelles, geese, ducks and swans and slaves of Numidia. But the horse and the camel of Arabia were wanting; they knew nothing either of the elephant or the giraffe of Africa; the sheep of Europe and the poultry of China are nowhere to be seen; nor had the house cat yet assumed her witch-role on the hearth.

* In his paper on the Antiquity of Man, read before the last meeting of the Ethnological Section of the British Association, meeting at Dundee, August, 1867, Mr Crawford, who is a believer in the multiple origin of our race, adopts Champolleon's date for the beginning of Egyptian history, 9000 years before Christ, and argues for an immensely older history. upon the ground that language, civilization, letters, arts, agriculture, and the domestication of animals are slow processes. Too much stress, however, must not be laid upon this consideration, for when genius speaks the times obey and hasten to realize its propositions, and to fulfil its prophecies. Sir J. Lubbock, although an advocate of the unity of origin, agreed with him upon the point of the antiquity of Egyptian civilization, and the necessity for previous ages of emergence from the savage life of the cave-dwellers.

But these people at the beginning of written history had no ships for commerce, and could not have introduced what existed around the shores of the Mediterranean, or along the Indian Ocean. But what did then exist? The rest of mankind seem to have been savages, without cats also. Probably neither the horse, nor camel, nor elephant, nor sheep, nor pheasant had yet been tamed, at all events not within reasonable reach of these rich farmers of the Nile. That they enjoyed a happy, peaceful, and sometimes a jolly life is easy to see, for the walls of the Memphite tombs are covered with pictures of feasts, and games, and dances, and boat tournaments, such as amuse the populace of Paris in July; there you see poets chanting verses, and dancing girls with hair tressed up with plates of gold. But you may look around in vain for the symbols of any kind of warfare. Not a trace of military life is visible on any monument previous to the 12th dynasty: and very little trace of religion. How the dynasties were founded, or how they were overthrown, or changed, we cannot learn; nor how the priests, if any then existed, turned an honest penny. The deity had neither name nor image. Osiris was unknown. The dog Anubis is the only guardian of these primeval mansions of the dead, the first deity as the first friend of man. We can make out only the signs of a purely patriarchal civilization in a land of peace and plenty. Each tomb is built by each farmer for his eternal residence. His effigy is seen in it, surrounded by the pictures of his wife, his children, his servants, his scribes, his dogs and green monkeys and his household goods. And all this 3000 years before Solomon built his temple on Mount Moriah, or the Assyrian his palace on the platform of Koujunjik.

We may speculate upon the assertion that the Egyptians of the delta of the Nile sailed up the Adriatic and settled the delta of the Po, then crossed the Alps and descended to settle anew upon the delta of the Rhine, from whence they seized on all the smaller deltas of the British islands. We have nothing but fancy to guide us in determining how far the older civilization of the Egyptians modified the influence of the great emigrant race—the Phœnician—in forming the civilization of Europe. We have no sufficient demonstration of any such influence radiating from ancient

Egypt, except in matters of religion, and through the intermediation of other races, of which more hereafter. For the present let me leave impressed upon your imaginations one clear image—the contrast, the marvellous contrast between the two pictures I have drawn. On the one hand we have this picture of peace and plenty among the ancient landholders of the valley of the Nile. On the other hand we have that picture of want and warfare dominating the life of the wretched savages in the pine-woods of Scandinavia, and standing for the condition of the human race or rather of all the other human races existing at that ancient epoch outside of the valley of the Sphinx.

Yet such a contrast still exists in all its grim integrity upon the earth. Compare the palaces and parks of England and New England with the wigwams of the west or the negro cabins of the south; with the utter homelessness of the Hottentot and Australian in the one hemisphere, or the wretched reflection of primeval barbarism among "*les misérables*" in Paris or in London. And so the world hoards up its old letters, although they can only be re-read with shudderings and tears.

LECTURE VII.

ON LANGUAGE AS A TEST OF RACE.

THE subject of the language of man will engross our attention this evening.

Those who believed in the origin of all the human races from a single pair found the question of the probable language spoken by that pair and their immediate descendants considerably simplified. The fathers of the Church took for granted that the language of the oldest writings which the Church accepted as sacred and divine was the language in which Adam and Eve addressed each other in Paradise. When the critics of a later age began to find reasons for believing that the Mosaic records had been compiled from the most worthy scraps of the most ancient written traditions, it only strengthened the claims of the Hebrew to be the language of the antediluvian patriarchs.

But when the science of comparative philology was discovered the special students of certain special languages, in their enthusiastic devotion to their special studies, began to put in other claims for this high honour and to dispute the pre-eminence of the Hebrew, contending that it must have suffered so many changes no one could tell what it had been in the beginning.

As the learned world woke up to an appreciation of the beautiful structure and great antiquity of the Sanscrit many were disposed to consider *that* sacred language of southern Asia the mother language of mankind.

Then came the Egyptologists with their monumental letters and improved chronology, antedating that of the Hebrews by several thousands of years. They proved that the Coptic language, although allied to the Hebrew, was in fact the language of the Pharaohs before Abram had come

out of Ur of the Chaldees. Coptic must therefore have been the speech of Paradise.

There were some to demand for the Armenian language the credit of being the oldest in the world. And there have been most learned Welshmen to parade the fact that their British mother tongue could afford a reasonable etymology for every one of its own words in proof that it alone could be the aboriginal speech of the world.

But the progress of the science of comparative philology has extinguished one by one all these absurd pretensions even without the necessity of a reference to the goodness of the foundation on which they rested, viz. the truth of the legend of a Paradise and a first human pair.

But although the science of comparative philology has been able to extinguish the claims set up by each individual language to be that which the earliest people on the earth spoke, it has not been able, on the other hand, to point out what was the original language. We are just as far removed to-day from knowing that as we ever were.

Comparative philology is one of the most beautiful and attractive of all the modern sciences. It is fresh and vigorous. It has an immense coterie of disciples and many masters. It has conquered a large territory and set up a splendid throne. It makes advances every year. It has established laws which are unshakable. It is a world of truth; no one doubts it. It is, in some respects, fully the equal of the other sciences. But in saying thus much we have said all we dare to say.

In other and very important respects, the science of comparative philology is young and raw, undisciplined and disorganized; or rather, rising as it has like a Phoenix from the ashes of its predecessor out of the cinders of what was known in the middle ages as the science of Language, it still retains, involved in its constitution, quantities of that unorganized magma all the elements of which it is bound some day to reduce to perfect order. In this respect it is far behind the so-called physical and natural history sciences. Some of its most important principles have yet to be settled. Some of its grandest questions have hardly been announced. Its doctors still pursue the most opposite methods. Its books are not only full of irreconcilable contradictions; they do not yet state any

grand body of universally accepted facts out of which fresh investigations can deduce acceptable generalizations.

The true principle for a *correct classification of the languages* for instance has not yet been established. Philologists have indeed worked out a number of fine groups, and settled to some extent their boundaries. They can talk to you about the Indo-Germanic family, and show you how it is broadly distinguished from the Shemitic family on the one side, and from the Tartar family on the other. They can separate the Teutonic languages from the Celtic and classic groups on the one side, and from the Slavonic group on the other. They can distinguish the southern or Teutonic from the northern Gothic or Scandinavian sub-families. They can designate seven or eight chief subdivisions of a single language like the French. They can go much farther even than that, and count up its patois or local variations until they reach an incredible number.* And all this amounts to something certainly. It represents a vast amount of hard work. But it does not represent as yet *a law of classification*. There is no established and accepted classification of the four or five thousand languages of the earth. There is even the greatest difference of opinion among philologists as to the true principles upon which we are to decide whether a language actually belongs and why it must be considered as belonging to one group rather than to another. Some base the classification upon the grammar: others upon the dictionary. The science of comparative philology is now in the same state in which comparative zoology was before the days of Cuvier when the bats were classed among the birds because they lived by flying in the air; and cetaceans, whales, seals, walruses, &c. with fishes although they breathed the air and suckled their young; and lemurs with squirrels instead of with the monkeys where they actually belong.

And, in fact, we may as well say at the outset that all the great questions which have come up for settlement in the other older and maturer sciences come up again in some analogous form for settlement in this young raw science of

* See the variations on the words 'deux fils' in the *Transactions of the Antiquarian Society of France* (C. 9. 13).

comparative philology. And how indeed could it happen otherwise? For the things which we call *words* are *organic* things like animals and vegetables. They have roots and branches. They grow and decay. They have fixed laws to govern their existence, like all other beings. They do not leap from our mouths helter-skelter, as the toads and jewels dropped from the mouths of the daughters of the cruel stepmother in the fairy tale. They are not accidentally created. We are not their voluntary creators. They breed in us and issue from us, not only from our lips but from our brains, by laws as regular and permanent as those which govern the conception and birth of broods of fishes, birds or serpents. Language therefore must be a department of natural history. New expressions or idioms appear upon the face of human society just as new species and varieties of animals and vegetables have successively made their appearance upon the surface of the earth and in the waters of the sea. And words and languages perish and are preserved in the history of literature precisely like those fossil forms of extinct plants and animals which we study in the geological deposits of the past.

With the great fundamental principles of natural history therefore which we have had before us already more than once during the course of these lectures we have again to deal to-night. Philology finds the same lions in its path to the House Beautiful which have frightened the other sciences that have preceded it in pilgrimage.

In the first place, there is the great possibility of spontaneous production, or equivocal generation as the naturalists call it. Mr Crosse took certain mineral matter, boxed it up carefully so as to exclude the air, heated it so as to destroy all germs of previous life, and sent for many weeks a perpetual current of galvanism through it so as to arouse the dormant powers of organic life. The result was, as he declares, that living insects made their appearance in great numbers. But the rest of the world doubts the fact; a few only believe. Now what say philologists as to the possibility of a similarly spontaneous origin of a *word* out of the raw stuff of thought? Some affirm that new words are continually appearing in all languages like Mr Crosse's *acari*. Others, on the contrary, stand by the old doctrine that *like breeds like* and that all living forms

must come from germs or living cells which are already organized nuclei of vital forces, or rather, in the language of the schoolmen, vital forms, *formæ formantes*. Such philologists affirm therefore the necessary previous existence of linguistic roots, and believe that all words must be developed out of roots; that the great business of philologists is to investigate roots in languages, to restrict the number of these roots in any language to the smallest quantity, and to compare the roots of different languages together so as to obtain a true classification. A school of oologists exists therefore as really in the science of comparative philology, as in that of comparative zoology.

But when you come to consider these roots or germs of words you find nothing in the shape of a settled principle. Some philologists consider all the roots of words as originally verbal, such as: to be, to go, to strike, to cut, to breathe. Others restrict this *verbal* character to a few roots, and call all the rest nouns out of which verbs have been made. Some consider the root of a word reached when it is reduced to three letters; others despise roots which consist of more than two letters. But nothing tells more plainly against the existence of any well-made-out law than the different number of roots to which different philologues reduce a given language. The Sanscrit for instance is said to have 500 or 600 roots. But Kraitsir, before he died, had reduced the number, in his own opinion, to a little over 200. Haldeman thinks no language can show more than 300.

But the great question is about the spontaneous generation of these germs, or roots. Then, at what age in the history of man did they appear? Were there a certain number of aboriginal roots spoken by the tertiary, post-tertiary, or stone-age men? or have word-roots been making their appearance all down through history, one at a time, or in groups, sufficiently numerous to institute new branches of language, or new languages? Then again, by what law of life did the roots of words get created at first? or by what law do they continue to get created? And if there be such a law of life for these word-roots does it include in itself a law of permanence, and a law of universality, i. e. does it secure the creation of a given root-word in *all* languages; and then, does it secure the *continued existence* of that root-word to the end of time?

Or, on the contrary, is there a law of *change*, by which no original root-word has been able to maintain its integrity, but has fallen from its first estate and become depraved? or, to state in other words this last question, do we find raging in this science of comparative philology the same warfare respecting 'a law of development' by which one word-form-species gradually changes to another, and so one language to another, by old roots dying out and new roots striking in to the common soil?

Let me take up two or three only of these questions, and state what I think is wanting to the science of philology to place it on a footing to do something for us in our investigations into the early history of the human races and their migrations. For, at present, in spite of the high pretensions of its disciples, I do not think that we get any ethnological light from Philology worth speaking of; but, on the contrary, I think that in the position which the science occupies it casts a deep shadow of obscurity upon the whole subject of the human races. Whatever else therefore I must hurry over or omit to-night for want of time, or to avoid confusing your attention, this one thing I wish to make clear, my reasons for believing that the method of philologists must be amended and to a great extent re-modelled before we can get rid of some of the grossest errors in ethnology or really obtain a complete view of the relations which the human races hold to one another and to the present state of things.

The origin of language may be regarded either, 1. as a supernatural revelation of a language already perfect to the first human beings; or, 2. as a power of language given to the first human beings in addition to all their other peculiar faculties as human beings; or, 3. as merely a superior human development of a general power of language (or faculty of expression) possessed by the whole animal world, inherent in fact in the constitution of all animated beings as well as man.

The first of these modes of conceiving the possible origin of language as a divine revelation was almost universally adopted by heathen philosophers and Christian theologians to a very recent date, and is still indulged by those who believe in Adam and Eve in Paradise. Although the most natural way of understanding the old legend that Jehovah

brought to Adam all the birds and beasts and creeping things that he might give to each of them its name would be to suppose existing in Adam's mental constitution a mysterious faculty of representing what he saw and knew by audible sounds intelligible to his wife and children. Science, however, can take no note of the supernatural unless it becomes natural and takes the oath of allegiance to nature. Nature itself is too supernatural to require any additions from the realms of human ignorance. And moreover, if there were more aboriginal human races than one there would be needed as many repetitions of the same revelation of language; unless to each race a different language were revealed; in which case the confusion of tongues at the building of the Tower of Babel would have been anticipated.

The second and third modes of conceiving of the origin of language are the modes now adopted by men of science. And they only differ in degree according to our views of the relative dignity of man and the brutes. All philologists are more or less disposed to place among the natural attributes of man a faculty for expressing himself and expressing the outside world also in appropriate words.

Some go farther and say, that this faculty for vocal utterance of mental feeling is common to man *with* the brutes; that the brutes are *not* brutes, i. e. mutes; that the animals all have parts of speech; and that man has the faculty of speech only and simply because he is one of the animals: His faculty is larger and finer than theirs because his brain is larger and finer than theirs; because his mental, moral, and spiritual nature is more angelic; because his senses deal with a larger world and his tastes are refined by civilization. But, however his poetry may soar, and his eloquence burn, and his prayers go up as acceptable incense before Him that sitteth upon the throne, and before the Lamb, these glorious phenomena of thought made flesh in language are as closely and eternally related to the bleating of the flocks and the warbling of birds as the infinite scope and sweep of solar systems in the heavenly spaces are closely and eternally related to the spiral flight of a bee when the hunter liberates it from his box in a dingle of the forest to guide him on to rob its hive.

It makes no difference to the main question of the origin

of language whether man takes the animals into partnership or not, provided he considers his faculty of language *constitutional*.

But now we approach the difficulties. *How* is human language constitutional?

It may be asked in reply: How is taste constitutional? How is conscience constitutional? How is any one of the bodily senses constitutional? The schoolmen have answered this as they have answered the other question, by saying that conscience is a gift from God. Religious people get over a similar difficulty by preaching and praying for a change of heart. The old philosophers went farther and very logically, when they made Taste a supernatural revelation; and we retain a fragment of their superstition in our popular use of their word *Genius*, by which they understood a veritable divine possession, analogous (but opposite) to diabolical possession. But no one has gone so far as to make our *bodily senses* supernatural. We let the physiologists alone and wait patiently for their newest and best descriptions of how these faculties are constitutional. In like manner we read Paley and Locke, and Kant and Comte and Sir William Hamilton, and Mill and Spencer and all the rest of the psychologists, to get the latest and clearest and most consistent views of the constitutionality of our higher powers, taste or the faculty of liking, conscience or the faculty of judging, worship or the faculty of serving. Why, then, should we not hear Schlegel and William von Humboldt and Max Müller describe the latest and best modes of conceiving how language, or the faculty of self-utterance, enters as a harmonious part into the human constitution?

I say *modes* and not *mode* of conceiving, because these highest philologists are not agreed. There are four theories of the way in which a constitutional tendency to language in man may work itself out and produce words, or if you please roots, or germs of words.

Without asking you to take my names as perfectly descriptive of these four methods, but only as sufficiently suggestive to make my descriptions plain, I will call these four ways:—

1. The method by imitation.
2. The method by interjection.

3. The method by sympathy.

4. The method by invention.

The first theory of the formation of words, by *imitation*, supposes that men were originally children or if you please monkeys with superior vocal organs capable of reproducing all the sounds of nature which fell upon the ear; and that they necessarily called the dog 'bow,' and the cow 'moo,' and the sheep 'baa,' before they could discover their properties and invent other and higher names. You are aware that the ancient grammarians termed the whole class of such imitations 'onomatopœic' words, and that this term is still in constant use. Our boys are taught at school that such words as *hiss*, *rattle*, *clatter*, *splash*, and many others, are natural attempts to make language out of the noises of nature. And it is no doubt so. All languages have this kind of words. Everybody betakes himself to imitation when he hears a new sound in nature which has not before been named.* But, on the other hand, it is curious to see how little resemblance exists between the names of a natural sound in different languages. It is as if the ears of different races heard these sounds differently. To understand why, let any one listen to some inarticulate sound—for example, the roar of a bull—and observe how circumstances alter its character,—how it is one thing when near, and another when far away,—how one might think at this moment that it sounded like *low*, at that moment like *ko*, at another like *moo*, at a fourth as if it had no consonantal beginning, at a fifth as if it had a consonantal ending, &c. It is impossible that all human language should have arisen from so meagre and so indefinite a stock of primary imitations of natural noises. To say nothing of the necessary expression of purely mental creations—the intransitive verbs to *be* and to *have*, for instances—and a hundred other equally aboriginal and indispensable words in every language, for which no sound in nature ever could have stood as model.

The second theory, that of *interjection*, provides for the

* I have a little cousin three years old who began to call a pencil *rex* (*rech*), and has continued to do so ever since. I know of no other origin for this word than an attempt to imitate the harsh scratch of a slate pencil on a slate, although his parents are not aware that it had such an origin.

difficulties which are raised in the way of accepting the theory of imitation. It is supposed by many that the rational soul of man struggled into speech as the Christian enters the kingdom of heaven, by violence. That at first the communication of man with nature and with his fellow man was like that of the animals, and like that of idiots, by cries and yells, by groanings and sighings, by rude attempts at varied musical notes, by hissings and mutterings and murmurs, gradually getting modulations of their own and falling into series under the government of the memory and the judgment as these became cultivated by exercise. Certainly there are interjections in all languages, ohs! and ahs! for wonder and admiration and complaint. But when we compare the interjections of different languages, we soon perceive that there exist but half-a-dozen which can be called universal, or could serve as a starting-point for language. The moment this narrow charmed circle is past all uniformity ceases and some other law of word-making must be supposed to interfere. What resemblance, for instance, can be traced between the English interjection *alas!* and its German synonym *leider*; The English *wo!* is the same as the Latin *vae!* (pronounced wai), but the French *hélas!* has not the least likeness to the Pennsylvania-Dutch *autsch!* If there be an interjectional common language for mankind then it must be so beclouded by differences in the vocal organs, in the passions, and in the mental experiences of the different races, and its root-words must have suffered so much change, that all attempts to use it as a guide in ethnology must prove futile. At the same time, the interjectional efforts of the soul in the direction of language cannot be lost sight of in attempting to explain some of the mysteries and curiosities of literature, as I will have occasion hereafter to show. And Dr Kraitsir was perhaps nearer the truth than many of us imagine, when he taught that the native interjections of the voice went forth from the mouth under the influence of a genuine *entente cordiale* or permanent good understanding between, first, the body of man and his mind, and secondly, between the mind and surrounding nature.

For the third theory of language, then, I use the term *sympathy*. Dr Kraitsir's interpretation of it is only one

of several. Other philologists describe it and illustrate it in somewhat different ways, but they all come to the same thing in the end. Now the nature of this sympathetic relationship existing between man and nature is perfectly mysterious, and we may well be prepared for complete mysteries in its vocal manifestations. The first formation of language must be a great mystery on any theory. But it is a phenomenon no stranger than the newborn child's knowing how to suck. When I give you one or two illustrations of Dr Kraitsir's views, then you will remember how deep into nature these magic influences penetrate; and how the automatic adjustment of the crystalline lens of the eye to objects of sight according to their distance from us is as inexplicable an act of the brain as any automatic adjustment of the tracheæ to the objects of conversation.

To see then how an act could be expressed in a word, let us take for an example the act of *going out*. What is the *going* to be referred to? Dr Kraitsir answered: to the *breath*; and what the *out*? Answer: to the *mouth*. If now we can make the breath perceptible to the ear, first while still within the mouth, and then after it has issued from the mouth, and if we can give our auditor a clear idea of these two things *in connection*, we shall have expressed '*going out*.' Let us then first make a noise in our *throat*, i. e. pronounce the guttural *k*; then let us make a noise of wind issuing from our lips, or rather issuing from between the tongue and the teeth, i. e. pronounce the sibilant *s*. The word for *going out* will then be simply the two letters *k-s*, pronounced together, *ks*. This is the actual Latin word *ex*, out of.

If you wish a more complicated instance, I will give you Kraitsir's favourite example, which always made me smile I confess, but which furnishes a very perfect example of the mode in which this theory of the sympathetic formation of language applies its principles.

How can we imagine that the human mind would act upon the larynx and mouth so as to give an outsider the idea of abstract solidity, matter, body? A body is matter in three dimensions, vertical, horizontal forwards, and horizontal sideways. Now the organs of speech consist chiefly of the throat, the tongue, and the lips; the first is

vertical, the second horizontal forwards, and the third horizontal sideways. If we take, therefore, a guttural, a lingual, and a labial, we can with these three sound the three dimensions of matter, i. e. express the idea of a body in the general. Thus:—K·R·P, *corpus*, the Latin word for body. From this word can now be formed nouns, verbs, adjectives, adverbs, &c., expressing modifications of this idea of solid body, *ad libitum*; such as *grip*, *grab*, *grave*, *engrave*, &c.

The difficulty in the way of accepting such a system of etymology is exactly the objection we feel to letting children drive a fast horse—it will run away with them and smash everything to flinders. All the most accomplished philologists of our day, all the patient and successful investigators into the historical etymologies of words—beginning with Jacob Grimm, the father of the modern science of comparative philology, and including such men as Bopp and Pott and Schott, and Kahlgren and Rochrig, Halde-man, Whitney, Max Müller, Ernest Renan—set their faces dead against what they consider to be only a revival of the wild vagaries of the fanciful philologists of past times, from the old Cratylus of Greece to the new Cratylus of Oxford, the Evanses, the Pocockes, the Davises, the Cannes, and a host of other names, most erudite and ingenious people, but working on the old and false system of mere analogy, a system which we dare not now return to because it would be subversive of all the laws of letter-variation and word-derivation which have got themselves established and illustrated within the last thirty years as fully as any of the laws of physics or natural history.

If you wish to see how the old system of etymologies is abhorred and repudiated by the masters of the new system of linguistic mutation and derivation, I would refer you to the second series of Max Müller's Lectures on Language. He is particularly severe upon the first two theories which I have enumerated—the method by imitation, which he calls the 'bow-wow theory,' and the method by interjection, which he calls the 'pooh-pooh theory.' Speaking of the first or bow-wow theory he says, 'the onomatopœic theory goes very smoothly as long as it deals with cackling hens and quacking ducks; but round that poultry yard

there is a dead wall, and we soon find that it is behind that wall that language really begins.'

To illustrate the ridiculous excess to which the second or pooh-pooh theory may be driven by its ignorant advocates he recites from the Honolulu newspaper, the *Polyneesian*, of 1862, an etymology of the Hawaiian word *Hooiaioai*, to testify, viz. from five roots hoo-o-ia-io-ai, meaning causation, interjection, pronoun definite, rapid and thorough movement resulting in realization and completion,—or in English words, *make that completely out to be a fact*, *Hooiaioai*; *testify to its truth*. Nothing could well be more ridiculous. And yet our libraries are filled with old volumes on language containing literally myriads of etymologies as ridiculous and more ridiculous than that.

To take another class of etymologies from the list of proper names of persons in the Hebrew Scriptures: when their compilers explain the change from Abram to Abraham by the announcement that he was to be the father of many nations because in the Hebrew of Solomon's day *ab*, *rab*, and *am* were the three words for *father*, *many* and *people* without reference to the fact that his original connection was with central Asia and its languages, why should we accept their etymology? How evidently has the story of Sarah's laughter been inserted in the legend of Isaac's birth in order to support the etymology of his name from the Hebrew verb to *laugh*! The explanation of the name of Moses: 'because he was drawn out of the water,'—are we to prefer it to that of the monumental Egyptian proper name MAS, which means a *child*? or must we seek still other fanciful resemblances to other Egyptian roots? All such etymologies unsupported by well-known facts capable of comparative investigation it is a waste of time to quote, and a drawback if employed in the study of ancient history. The method is a false one—radically false.

But let us not be frightened away from our dinner of honest mutton chops or noble roast beef because French cooks can deceive the traveller with ragouts of cat when he calls for hare. A Cuvier will eat his cat with great nonchalance, and hold up one of the bones to the landlord after dinner, remarking with a smile that his hare must have been a most singular specimen, having an anatomy analogous to the carnivores.

When a transcendental philologue constructs an etymology for such a word as *bersil*, the Hebrew word for iron, out of the Hebrew verb *peres*, to pierce or cut and a supposed determinative final letter *l* meaning through, the conclusion is as empirical and unscientific as fanciful and untrustworthy as when the ancient Talmudists derived *bersil* from the initial letters of the names of Jacob's four wives Bilhah, Rachel, Zilpah, and Leah. But when a comparative philologist, obeying the canon of modern science that 'no scripture is of *private* interpretation,' takes up the study of all the names of iron in various languages, and as one of a whole group of metals, and perceives, first, that when reversed the Shemite name for iron is the Indo-Germanic name for another of the metals, *silber*; and secondly, that its first syllable, *ber*, is also represented by the Latin word for gold, *aur*, the German *baar*, the English *bullion*, the French *bague* (originally *balg*, a golden ring), and other similar analogues,—and that the second syllable, *sil*, has similar relationships with *cesel*, *chalkos*, &c., &c.; he is on the high road to some valuable result, which his investigations will be sure to reach if patiently and carefully pursued.

The question is not what etymologists who are ignorant of or indifferent to Grimm's laws of mutation have done with the roots of language; but the question is, how did the roots or germs of language originate? Müller himself distinguishes between these questions. 'There is *one class* of scholars,' he says, 'who derive all words from roots according to the strictest rules of comparative grammar, *but* who look upon the roots, in their original character, as either interjectional or onomatopœic. There are *others* who derive words straight from interjections and the cries of animals, and who claim in their etymologies all the liberty the cow claims in saying *moo*, *booh*, or *oo*, or that man claims in saying *iooh*, *fi*, *pfui*. With regard to the former theory, I should wish to remain entirely neutral.' It is only the latter that he opposes. He does not pretend to say how much of the language of the first savages of the earth consisted of imitative cries and interjections; but of this he is quite sure, that the historical languages of after times obey laws of mental growth and rational arrange-

ment which are our only guides through the forest of etymology.

Professor Pott even denies that the root-words of languages ever were words—spoken words. He thinks that they are mere abstractions obtained by our analysis of languages now spoken. He says, if they existed at all in early ages they existed merely as dim, vague, floating, formless ideas in the savage brain, and came out in that ancient savage speech sometimes in one form sometimes in another, at the whim of the speaker or the promptings of the moment.*

But Müller cannot take so German a view of roots. He has imbibed in Oxford too much of the practical genius of the English. He leaves the ghosts of words behind him, with all the other ghost faith of his fatherland. He thinks the ancient roots of words were the first actual words in use; but then, they were used without any grammatical definition. 'I think,' says he, 'that there was a stage in the growth of language, in which that sharp distinction *which we make* between the different parts of speech had not yet been fixed, and when even that fundamental distinction between *subject* and *predicate* on which all the parts of speech are based had not yet been realized in its fullness, and had not yet received a corresponding outward expression.'† He refers to languages at the present day in this germinal condition. In Chinese, for instance, *ly* means *an ox, a plough, and the act of ploughing*; *ta* means *great, greatness, and greatly*. In Egyptian *an'h* meant *life, living, lively, and to live*.‡ Other languages are seen just coming out of this first stage into a second, where the root is retained, and another root is attached to it to show the mental distinctions. In the Polynesian dialects any verb may be used unchanged as a noun or adjective by adding *kua* or particles of affirmation, and *ko* or particles of the agent.§ In our own English we speak in the same way; we say *make, make-r, make-ing*. Müller gives a still more striking illustration from the language of children, that

* Etymolog. forschungen, ii. 95. in Müller, p. 95.

† Second Series of Lectures, p. 95.

‡ Bunsen's Egypt, i. 324, in same.

§ Hale, p. 263, in same.

world of perennial savagery, that fountain of antiquity welling up for ever at our feet. And let me here assure you that some of the finest laws of comparative language have been discovered by watching the speech of children. Out of the mouths of babes and sucklings He hath ordained praise. And he who thinks that he can settle the laws of morality, or of reason, or of language without the closest and most patient investigation of infants and young people will never become a master in any of the schools of the future,—of that he may rest well assured.

What then is the process of forming word-roots in the mouth of children? A child says 'up! up!' meaning, 'I want to get up on my mother's lap.' In his mind noun, verb, adjective are completely confounded and form an ideal unit. It will be months or years before he can separate the subjective *I* from the objective *mother's lap*, or the *want* from the *action* of getting up into it.

But, after all, we do not get an idea of the origin of this word *up*, which stands for so much. Our children take it from ourselves. We got it from our English ancestors; they from their Saxon forbears. How far back it can be traced we do not know. We know of no sound in nature of which it could have been an imitation. We know of no explosion of feeling to produce such an interjection. It would be hard for Dr Kraitsir to devise a spiritual explanation of its sympathy with what it represents, whether as *up*, *upward*, or *upon*; and if he could, the explanation would not stand good for its correspondences in other languages, such as *auf* in German, *su* in Italian, or *avw* in Greek.* And what is true of this word is true of all other unimitative and uninterjectional roots, the world round, and the ages through.

Have we no explanation, then, for the origin of the great body of aboriginal root-words, and for the numerous primary monosyllables which we use every day? I must repeat what I said at the beginning of this lecture, that the

* The sound of *up* (*ab*, pronounced *ap*) is employed by the Germans to express the very opposite sense of *down*. The French have no word at all corresponding to the English *up*, for their *en haut* is the English *on high*; and their *sus* is never used but in composition. That curious example of 'polar meanings,' *au dessus* and *au dessous*, is repeated in a wholly different form in the German *auf* and *ab*.

science of language is in its infancy. But still we are not wholly helpless. You remember that I enumerated four theories of the origin of words; but I have described only three thus far: the method by *interjection*, the method by *imitation*, and the method by *sympathy*. Each of these methods is available for some words; and the method by sympathy plays an important part in the construction of large sections of the historical languages, as I may perhaps make clear hereafter, in discussing the formation of the alphabet. But I must now describe to you the fourth theory, or the method by *invention*.

It is denied by many philologists that a new word is ever invented. If by this be meant out of the head, as we say, that is, without any reference to existing words and things, it may possibly be true, although I doubt it. But if it be meant that no new words have ever been deliberately constructed and put into circulation by intelligent human beings, words which had no connection with the organic development of language, I think that all human experience, certainly all literary history, proves the contrary. Nay, I think that I can show that the majority of the words now used by civilized people are *inventions* or modifications of purely invented words. Nay more—and this is the principal thought which I wish this lecture to leave impressed upon your minds—there is a vast, a dominant element in language which I call the *bardic* element, because it consists of words invented by *bards* (poet-historians and poet-priests of old times), by *druids* if you like that title better—an element which has superseded and overgrown the more ancient and savage elements of language just as the oak forests of the Bronze age superseded the pine forests of the Stone age, and as the beech woods of the Iron age superseded the oak forests of the Bronze age—an element produced by the cultivation of the civilized intellect; an element of religious, moral, and social terminology, which now forms the chief and almost the sole bond of communion between the various languages of the earth. And philologists have so far ignored, despised, or overlooked this element as to throw, as I have said, a profound shadow over the early history of man, and a well-entertained suspicion upon the best conclusions not only of linguistic ethnology

but of their own science of comparative grammar itself.*

I shall attempt nothing more this evening than to illustrate these assertions, trusting to the incidental topics of the remaining lectures of my course for something like a reasonable demonstration.

The great effort of *linguistic* science has been to prove that the present races of men came from one original race by showing how all languages now spoken by these races can be traced back to root-words which must be supposed to have formed one original language. I have already said how many difficulties start up in the way of any such showing, and how little prepared our system of linguistic principles is for such an undertaking. But furthermore, language is the utterance of man's spiritual nature. It must therefore be commensurate with that nature. It must vary as that nature varies. It must grow with its growth. We see the process of development of language parallel with the development of mind in every child. Every child drops the first language it has learned to speak and takes a new and better language suited to its advancing years. Again, the language of the boy is exchanged afterwards for the language of the man, when observation, reading and society have enlarged the mind still farther.† See how the turgid style of the poetic youth disappears before the solid matter-of-fact style of the man of business. See how the Johnsonian polysyllabic Latinism of five-and-twenty gives place to the nervous Saxon monosyllables of fifty. How smooth and fluent are Carlyle's first pages! how harsh and unreadable his later books! On the other hand, see Edmund Burke give up his chaste and simple early English for flowery and fantastic periods in his later years. All language is a daguerreotype of the soul. It is inconceivable that the men of the Bronze age, even if they were lineal descendants (which they probably were not) of the men of

* Prof. Whitney, in his lectures on Linguistic Science delivered at the Smithsonian Institution, in March, 1864, says, 'It has quite recently been found that language is the principal means of ethnological investigation, of tracing out the deeds and fates of men during the pre-historic ages,' &c. All this ought to be true, but it is not yet true.

† The boy swears in Basque, *by Jingo!* (*Jinco*, Basque for God), and the man in Greek, *by Jove!*

the Stone age could have spoken the same language with that of their ancestors. Later civilizations must have instituted still different languages. All language is in a state of flux. Savage languages, as has been often asserted, change rapidly from generation to generation. Our north-west Indians, we have been assured, could not comprehend their great grandfathers if now alive, and hardly their own grandfathers.* Nothing but writing down a language can save it from destruction. Nay, that will not do it. The Hebrew is gone; the Sanscrit is gone; the ancient Syriac is gone; the Babylonian, Assyrian, Egyptian are all gone; and all we know of these mammoths of past mind we learn only from scattered fragments of them fossilized in parchment or in stone. Look at the changes which English has sustained since Magna Charta was engrossed. Nothing but printing will save a language from decay. Stop the growth or prevent the change of mind and you can stop the growth and prevent the change of language. Printing does this in part. Printing fossilizes mind. The newspaper is an epidemic of paralysis. When 30,000,000 of people wake up in the morning together, sit down to their breakfast at the same hour, call for 5,000,000 of copies of the same column of telegraphic despatch-news printed over-night, and one half of them make their remarks upon the news in the same democratic terms, and the other half in the same aristocratic terms, the good God has arrived at the end of his individual creations. Individuality is gone. One language at least is fixed.

Now, if in all times this law of the growth and change of language in dependance upon the elevation of man's life out of savagery by civilization and of the development of his intellect by culture has been in action, how absurd is it for philologists to suppose that they can recover by the examination of either present grammars or present vocabularies the primeval languages of the Stone age; or determine the alliances of pre-historic tribes; or trace the migrations and intermixtures of these tribes from one side to the other of the globe! All those primeval languages are buried up deep underneath a mass of pre-historic lan-

* This was positively denied, however, by one of the first missionaries of the Hudson Bay stations, who told me he formulated the northern languages, and found them rich and harmonious and almost invariable.

guages, which in their turn have been overlaid by the old historic tongues, which in their turn have been overlaid by the dialects now spoken. As well might the geologist expect to make out the lithology and structure of that inaccessible primeval crust which we must believe to exist beneath the Laurentian system the base of which we have never yet seen. As well might he expect to study the old Silurian and Devonian limestone, slate and sand deposits by analyzing the cretaceous and tertiary marls and clays which have succeeded and replaced them in the present surface. The philologist is even *worse* off than the geologist; for there are no Laurentian or Huronian or Silurian mountains of language outcropping from and overhanging the more modern tide-water plains of literary history. The oldest language we have any chance to study is the Egyptian, a language of only 8000 years' standing, and therefore in geological phrase a quaternary deposit belonging to the present order of things, a language already civilized, full of the terms of home and farm life, capable of moral and religious expressions, and so nearly akin to English in its staple that I might have taken from *it* my illustration of the word 'up,' a few minutes ago instead of from the English, for the Egyptian word was 'ap!'

When Professor Whitney therefore—one of the best philologists of the new school now living, and an honour as he certainly is to the science of comparative grammar—asserts, as he did in his Smithsonian lectures of last year, 'that it has been recently found that language is the principal means of ethnological investigation, of tracing out the deeds and fates of men during the pre-historic ages,' I demur emphatically to the allegation. I do not believe it. Unless by *pre-historic ages* he means merely the ages which *immediately* preceded the opening of monumental and literary history; unless he is willing to exclude entirely from the discussion that immense, back-stretching line of ages during which the human races were unlettered, unhistoric, uncivilized and undevout, all record of which is lost beyond redemption by philology and only to be recovered as a part of the geological history of the earth and its inhabitants by the combined efforts of the geologists, the palæontologists, zoologists and archæologists who have it entirely and justly in their charge. The philologists have

nothing whatever as yet to do with it. Nor will they have until among the fossil remains of primeval men some trace of letters shall be discovered. If for instance, bones in some Poitou cave be really found scratched with Sanscrit letters, then let philologists step in and join the conclave. But even then language will not be, as Professor Whitney says, 'the *p* *incipal* means of ethnological investigation.'

The great mistake made by the new school of linguistics is in supposing that there is no *fourth* theory of language; no *fourth* way in which words originated: viz. by actual *invention*; no part of language which encrusts and conceals the organic structure. The fact is, mankind may be divided into two parts, like the body and its skin. Richardson says that the characters in his splendid old novel of 'Sir Charles Grandison' are men, women, and Italians. History says that the characters in its drama of human life are men, women, and priests. Philologists of Professor Whitney's school busy themselves entirely about the men and women, but forget all about the priests.

There is a language peculiar to every bird and beast. There was a language peculiar to every human race. There is a dialect characteristic of each village, township, city, province of each nation, of each tribe of men now living. These are great studies for the philologist. They can be separately analyzed, and they can be compared together. Their individual histories can be worked out to a certain distance back, as far as there are any literary records. They can be grouped, and to a certain extent—a very moderate extent—classified. They even afford stuff for most ingenious and perfectly scientific and trustworthy conclusions, such as Grimm's laws of mutation and derivation. But they will not make of the philologist a trustworthy ethnologist. Why?

Because there is something else which he forgets to study, which he refuses to believe in. *There is a language of priests.* Because this language of priestcraft exists *in among* local dialects and national languages. Nay, because it is so interfused with them as to form a component part of their constitution. Every language of modern times is stamped with this priest-language all over on the outside, is full of it inside, in its flesh and in the marrow of its bones. No anatomical preparation to be seen in a

museum is more completely streaked and analyzed to the eye by the red substance of injection than is the English, the French, the Arabic, the Hindu, the Zingali, the Burmese, the Japanese, the Tasmanian injected and confused with a priestly language to the eye of the philologist who will consent to recognize its existence.

What this priestly language is, and how it seems to have originated, and why it is thus disseminated through all the various languages which are spoken by the various races of mankind, I shall endeavour to explain in my next two lectures on architecture and on the alphabet. But you will agree with me that if such an element can be proved to exist in various languages it must have the effect of greatly confusing and mystifying philologists who ignore its existence. And still more, if this element common to many languages is in fact the principal or predominant one of the elements which constitute their vocabularies, you can imagine how it must obliterate the original distinctions between languages and render the task of tracing the descent of races and their migrations previous to the introduction of this priestcraft almost if not entirely hopeless.

Here I should properly end the lecture of this evening ; but a few words, before we part, on the classification of languages found in the books. The text books of philology distinguish languages as of three kinds:—1. The monosyllabic, 2. The agglutinate, and, 3. The inflected.

The first kind are those which speak each word-root by itself, preceded and followed by other word-roots, each carrying its own idea in full, and leaving the hearer to find out the grammatical relation between them by his own wits, or by some accent or emphasis or musical modulation of the speaker's voice. The specimen of this kind usually given is the Chinese.

The second or agglutinate varieties of language combine the monosyllables which grammatically belong together into polysyllabic words, like the Saxon words *for-bear*, *cart-horse*, and into fixed grammatical idioms like *to be*, *to do*, *to insist*, *according unto*, &c. And this process can be carried on to any extent. Words which have been compounded of three or four words can be contracted to monosyllables and then compounded anew, as an economi-

cal family can live three days on a single round of beef by rehashing it with other portions of their meals from day to day. I may find occasion to illustrate this boiling-down and cooking-up process in language hereafter. Its phenomena are very curious and instructive.

The third class of languages, the inflected, are so called because their words are not served up pure and simple, alone or in courses, but garnished with prefixes and affixes, which are as variable as Soyer's recipes. The old grammarians called these variations 'cases,' or fallings-off from the upright simplicity of the word-root; and they gave names to these cases, nominative, genitive, dative, &c., for the purpose (apparently) of rendering it as difficult as possible for the grammar-school boys of Boston to pass their examination at Harvard. Our own grammatical grandfathers in their wisdom saw fit to transplant that barbarous Greek paradigm into an English soil, where nothing but the hop-pole support of the birch rod has ever availed to keep it in sickly existence. Yet we still teach our wondering babes to poll-parrot 'nominative, a man,' 'genitive, of a man,' 'dative, to a man,' 'accusative, a man,' 'vocative, oh man!' 'ablative—*non est inventus*'—although the whole genius of our language, which belongs to the second or agglutinate class, cries shame so audibly that the babes themselves have heard it. English 'cases!' there are no such things! In Latin and Hebrew and Sanscrit inflectional forms have been dread realities. How such a burden could have been borne by the educated classes at Rome and Athens and Jerusalem it is hard to comprehend. Some philologues have doubted that the Latin of the schools ever got spoken by any class below Hortensius and Cicero. But when we turn to our North American Indians and see how complicated the grammatical combinations and inflections of their dialects have been, we may believe that the very shepherds of Ephraim knew how to use the seven forms of the Hebrew verb—*kal*, he cuts; *niphal*, he is cut; *piel*, he cuts hard; *pual*, he is cut hard; *hiphil*, he causes to cut; *hophal*, he is made to cut; and *hihpäel*, he cuts himself—as glibly as the oldest rabbi of the Bagdad or Tiberias schools. In fact, there is no limit to the ability of an educated boy in the direction in which that education goes. Some of the most difficult languages,

completely artificial and admirably adapted for variety and precision in their use, are the languages of savage tribes existing at the present day. There is no good reason therefore for denying that the most ancient men of the oldest Stone periods had languages as complicated and as inflectional as any now known to exist, and with a vocabulary commensurate with the variety of things by which they were surrounded and of actions which their life gave birth to.

It is not to be admitted for a moment, that we must trace back the existing languages to their word-roots and suppose these word-roots to have constituted the early language or languages of man. We have no liberty to suppose that the earliest languages were monosyllabic. As I have said before, it is not at all established that languages become monosyllabic as we trace them backward. On the contrary, there are many things to show that the tendency of all languages is to grow more and more monosyllabic in the course of time, that is, in the direction towards our day, not backward towards the beginning. It is not proved that 'China and Further India,' as Prof. Whitney and many others with him maintain, 'are occupied by races whose languages are monosyllabic because they have never grown out of that original stage in which Indo-Germanic speech had its beginning.'* The great Orientalist, Abel Remusat, even refuses to admit that the Chinese is entirely a monosyllabic tongue, and instances such compound words as *tsiang-jin*, workman (Zimmermann), and *tchung-sse*, bell-master, to justify his doubts. Beste shows that there are only 100 real monosyllabic words out of 8000 which the Chinese scholars use; and although he thinks that the old Chinese was monosyllabic, he shows that the modern has 15 kinds of composition. Ampère condemns the doctrine of Chinese monosyllabism based merely on the ground of single characters. Abel Remusat shows how the Chinese terminal *-jan* in adjectives is exactly equivalent to the terminations *-ment* in French (from *mens*, *mentis*), and *-lich* in German. Plath explains how early introduction of Chinese monosyllabic writing prevented the rise of grammatical inflexions; and while maintaining that the meanings of affixes remain apparent,

* P. 111, Smith Rep., 1863.

gives many instances of one root retaining many meanings, instead of receiving new meanings by affixes.*

I have shown in a paper read before the American Philosophical Society of Philadelphia not long ago and published in their Proceedings, that when one classifies the names which have been given by people speaking many different dialects and languages to some one common and familiar and unmistakable object in nature, such as *wind*, or *fire*, or a *stone*, or the human *head*, or *hand*, this remarkable result is obtained: namely, that every organic utterance and shade of utterance possible to the human organs of speech, labial, lingual, dental, nasal, and guttural, has been employed to express the self-same object. I pursued the inquiry only through two or three hundred of the several thousand dialects and languages of the present or comparatively modern days; and yet in this small and hap-hazard collection it is perfectly apparent, that while in one country an object may be called *ba*, in another it will be called *da*, in a third *la*, in a fourth *na*, in a fifth *ga*; in others *ap*, *at*, *ar*, *an*, *ak*; in others *bar*, or *dar*, or *lar*, or *nar*, or *gar*; in others *dab*, or *nal*, or *pad*, or *lag*; in others other combinations of these elements will be in use in the form of a simple monosyllable; in others a more complicated system of dissyllables or trissyllables will exist; and here and there long words will have grown up out of one or other of the original simple elemental organic sounds;—and all these forms are in existence and in daily use in one age; and all these numerous modifications of utterly diverse lingual elements are in constant employment to express one thing, and that one thing a simple, unmistakable object of nature affecting the senses of all mankind alike.

I will close this lecture, then, by stating again and upon this new basis my conviction that most of the generalizations of the science of Comparative Philology—those which take hold of all the larger problems of human history, the origin of languages, the migrations of nations, the diversity of races, the development of mythologies—are as yet grand failures; and that a much more thorough-going method, a much profounder synthesis of facts is needed to lead us to the desired end of our researches in this field.

* See his theory at the bottom of page 216, Sitzungbe: R. Bair., Acad. 1861, II. iii., and top of p. 217. On the Tone Speech of the old Chinese with two pages of radicals, 161 in number (p. 212).

LECTURE VIII.

THE ORIGIN OF ARCHITECTURE.

THE Fine Arts preceded Belles Lettres in the order of time as well as in the order of a philosophical classification of the Intellectual Sciences. Men knew how to build before they knew how to write. You may be surprised that I interpolate this lecture on Architecture, between my last lecture on Language and my next lecture on Literature. But I follow the order of nature. The soul of man endowed with language utters itself first in sculpture and painting, then in literature, then in moral and beneficent deeds, and finally in acts of worship,—successively employing higher and higher faculties upon better and nobler materials. In the first stages of his savage existence man wasted most of his time and energies waiting on nature; watching patiently for the rise of a trout, or for the approach of a deer. Much of this time was whiled away in reverie. The hunter lived an inner life of mere perception; a continual stream of paltry observations flowed through him, having merely leaves and twigs, spiders and butterflies, occasional startings of bird and beast and glimpses of the outside sky and distant landscape for their only objects. This was no miserable life! It would be maligning the Divine Creating Charity to suppose it. It is the life of all animals—and they are all happy. So were the early races of mankind. So are all men yet. Come we to speak of *Happiness* we speak of that which God has made universal. It is a synonym for Life. Therefore we call God good. And the young man who leaves Harvard or Yale to tramp through the woods of the Alleghanies with a transit over his shoulder or a level-rod in his hand will soon learn how happy his first ancestors must commonly have been; and why the grave and me-

lancholy Indians (as we call them in our ignorance) are so full of fun and frolic at all times when not subdued by hunger, fear or drunkenness.

Now, the first and most natural and easy language of this animal happiness, after gesticulation, is sculpture. Hence all active savages amuse themselves with whittling. Witness all our boys, and all the grown-up boys of our Western country. The practice has been universal to all races, through all ages, from the beginning. It is the origin of sculpture, which in its turn made literature possible; for one of the oldest forms of writing which we know, the Irish Ogham character, was whittled out on sticks; and the early Egyptian characters were cut in stone. The tendency to employ the hands while the body rests is greater in cold climates than in hot ones; and therefore we should expect to find earlier traces of sculpture in the temperate zones. But sculpture is absolutely universal, and commenced with the appearance of man upon the earth.*

The earliest traces of it which we have (as yet) discovered, are on the scratched bones of the diluvium and

* The ingenious author of *Essai sur l'Inégalité des Races Humaines*, M. A. de Gobineau (Paris, 1853, Phil. Lib., vol. i. p. 356), has a theory that the artistic genius was equally foreign to the natures of the three great type races, yellow, white, and black, into which he divides mankind; and that it did not make its appearance until the white and black race mingled. 'Thus, also, by the birth of the Malay variety there sprang from the yellow and black races a family more intelligent than its double parentage; and again, from the alliance of the yellow and the white there issued means very superior to the populations purely Finnish, as well as to the Melanian tribes. I do not deny it,' he continues, 'these are good results. The world of arts and noble literature result from mixtures of blood, inferior races ameliorated, ennobled: these are marvels to applaud. The small are elevated. But, alas, the great at the same time are abased, and this is an irreparable ill not to be compensated. From the mixture of race come also refinements of manners, ideas, faiths, especially sweetenings of the passions and desires. But these are transitory benefits; and if I must recognize the fact that the mulatto, of whom one can make a lawyer, doctor, merchant, is better than his negro grandfather, wholly uncultivated and good for nought, I must avow also that the Bramans of primitive India, the heroes of the Iliad, and those of the Schahnameh, the warriors of Scandinavia, all phantoms so glorious of races the most beautiful long since vanished, offering an image of humanity more brilliant and more noble, were especially the agents of civilization and grandeur more active, more intelligent, more sure than the mixed peoples, mixed one hundred times of the present epoch, and yet already they were not pure.'

the cave-mud deposits. Many of these are merely marks left by the flint tools with which the savages removed the flesh from the surface of the bone, but some are indubitably patterns of the fancy, scratched in that *dolce far niente* mood in which a savage digests his dinner. Some are actually cut into imitative shapes. The most interesting specimens of Stone-age art which I have ever seen are those of roots preserved in the cabinet of M. Boucher de Perthes at Abbeville.* They were found in the peat-bogs of the river-bottom, and are therefore of less extreme antiquity than the flint instruments of the diluvium. But they are old enough, heaven knows! and very curious. They are in the form sometimes of men, with straddling legs and arms; sometimes of ducks, or snakes, or frogs. But whatever shape it may be, some artificial addition has been made to it by the joking savage to increase its likeness and to express his appreciation of its oddity, or perhaps we ought to add, in his eyes, to its beauty. For when we see how evidently, how inexpressibly lovely to the enthusiastic little mother-heart of one of our baby daughters her dirty, black, old, hideous doll can be we may believe that, to the art sentiment just sown and hardly yet sprouting in those aboriginal savage souls a black forked effigy of humanity with the addition of a cut with a flint knife for a mouth, and a peck on each side of its head for two eyes would represent Venus the goddess of loveliness, if not indeed Jupiter the awful thunderer. There is a good deal of accounting for tastes—when we consider circumstances.

The next stage in sculpture was probably imitations in stone of the marks of wet feet and hands. These would first be made at river fordings, and afterwards on the tops of look-out mountains. Such sculpturings are described in books of travels all over the world. The savage crosses a stream by swimming and dries his dripping body on some sun-lit rock. Then he waits for his companions, or for his prey, or for his enemy. Meanwhile he pecks away at one of the damp footsteps on the rock. Others notice what he has left undone and finish it. The footprint becomes a permanent landmark. Some battle there in

* The sculptured bones of the caves of the Dordogne had not been found when this was written.

subsequent days shall make it famous. Some deified hero shall be propitiated there by sacrifices. The footprint becomes a symbol of worship. You have all heard of the two footprints sculptured on the summit of Mount Olivet and worshipped by pilgrims as the marks left when Jesus sprang into the sky at his ascension. There is another footprint of Jesus preserved on a stone in the Mosque of Omar, at the extremity of the eastern aisle.* At Poitiers, in France the traveller may see two footprints of the Lord upon a slab enshrined in the south wall of the church of St Radigonde, made when he stood before her to inform her of her coming martyrdom.

The prints of the two feet of Ishmael are preserved on a stone in the temple of Mecca which tradition says was the threshold of the palace of his father-in-law, the king of the Dhorhamides.† Others say that they are the prints of his father Abraham's feet when Ishmael's termagant wife drove the old patriarch away from the threshold of her husband's house.

On the top of the highest mountain in Ceylon are the prints of Adam's feet. There are two immense footprints, 200 feet apart, on the rocks of Mägdesprung, a village in the Hartz mountains of Germany, which tradition says were made when a huge giantess leaped down from the clouds to save one of her beautiful maidens from the violence of a baron of the olden times.‡ The holiest object in the great temple of Burmah is the so-called footprint of Gaudama, seven feet long, divided into compartments and sculptured in an extraordinary manner in the fashion of an astrological charm.

My purpose is not to lead you into the dark chambers of heathen imagery. I might not be able to explain at all to your satisfaction this disposition of the human race to worship the human foot and everything belonging to it, though I have my theory for it. We will stick to our subject which is sculpture and its origin.

But I wish I could transport this audience to a mountain top where I stood one day last spring and show them a specimen of savage sculpture of the most primeval type.

* F. 33, 21, 4 index.

† Weil's Legends of Mohammed, 36, 23 h.

‡ 32, 2.

It is a broad-backed, flat-topped mountain in western Pennsylvania, the westernmost of those which compose the Alleghanies. It is cleft from summit to base, a depth of 1300 feet, by a narrow gorge through which flows roaring on towards the west to join the Ohio one of the fairest rivers in the world, the Youghioghany. On the southern brow of this gorge, looking down fearfully into it, and also looking broadly out over all the western country with a sweep of horizon taking in the blue distance of the Pittsburg hills, there is a table of bare sandstone rock. The people call it as the Indians did before them the Cows' rock. The road runs over it; and the tracks of wheels are scratched upon it. But ages before old Heckewelder's daughter was born the first white child west of the Alleghany mountains, the Indian's trail went over this same rock. And here the red men, weary with the hot and long ascent, rested themselves; pitched pebbles down into the abyss of the river gorge, and looked out over the illimitable forests of Westmoreland county to catch the distant smoke of the fires of their tribes. And while they sat they cut those fanciful figures in the face of the rock which still remain, half obliterated by the wheels of the white man's waggons, but still kept clean by the rains. There you may see the cloven foot of cows or buffalo, and human feet, and three-toed marks of birds, like Deane's and Hitchcock's ornithichnites, and waving snakes, and others not so easy to decipher. I went to see the place hoping that the imagination of the farmers had misled them and that the works would prove to be the casts of fossils; but there was no mistaking their artificial character.*

In the same way the human hand is stamped and cut upon a thousand cliffs and on the walls of temples. It was a favourite subject of art in Central America. You know it was used by the Roman legions as a sacred standard.

* Similar, more numerous, and more perfectly executed rock sculptures, covering the stoss sides and backs of some granite islets, in the bed of the Susquehanna river, at Safe Harbour, below Columbia, in Pennsylvania, have been photographed and described, from plaster casts taken of them by Prof. Thomas Porter, the president, and other members of the Linnean Society, at Lancaster, and published recently in the Proceedings of the American Philosophical Society at Philadelphia.

The two hands of man were his two great gods, his providers, his defenders. In the Thracian mythology they were the Cabiri, the great gods workers, and their children were the ten dactyloi, or fingers. Then, when men in old times grew tired of worshipping their own hands they began to worship the uplifted hand of the bard-priest blessing them and of the bard-baron crushing them. Afterwards its beauty seized upon the æsthetic sense of the artist, and men drew it and sculptured it for its own sake rather than for what it had accomplished. When the pope sent a commission to Michael Angelo to examine his ability he refused to be examined; but, seizing a piece of chalk he drew a human hand so boldly and with such grace and such expression that no further question could be asked; and so he built St Peter's.* Finally science drew the hand, and proved by it in a Bridgewater Treatise that there must be an all-wise and beneficent Creator.

Such is the history of all the fine arts.—There is an insensible graduation of art for imitation into art for ornament. The tools of one age become the amulets of a succeeding age; as in the case of the Swiss flints. The phallus found in the Poitou cave was either an idol or an amulet. The ladies of Rome wore such as breastpins in the Augustan age. The miniature hand lies as a paper-weight on modern tables and as a tablet on the wristlace of our ladies. The selection of odd forms of roots by the people of the Abbeville bogs is paralleled by the selection of bizarre laurel-root walking-sticks by modern young men. And the same love of the rare and beautiful which sets so high a value on the emerald and diamond now, caused the Stone age savage to string together round his neck the floating bits of amber which he saw and to perforate and hang about his loins beautiful small shells. The same feelings induced the Druid warrior to wrap a golden torque around his arm that induces an underbred American to set three California nuggets in his shirtstuds. The perpetual search for proper and perfect slingstones must have cultivated to the highest pitch and at the earliest periods man's faculty for form and colour in the materials of art.

* See the story in detail, in Grimm's *Life of Michael Angelo*, Bunnet's translation, vol. i. pp. 158—160. (Little and Brown, Boston, 1865.)

Some of the works of savages strike us with astonishment, such as the perforation of the precious stones by the inhabitants of Central America. But we must remember that the savage was never in a hurry ; time was not money then ; and what was made was kept and valued long. The ivory work of the Chinese is quite as wonderful.

But why should we waste time with the earlier stages of man's effort to express his appreciation of the forms of nature ? We have in architecture the summation of all his efforts ; the trial of his matured powers ; the efflorescence not only of his taste for form and colour but of his sense of grandeur and sublimity, of his ideas of the invisible powers by which he is surrounded, and of his hopes of future happiness.

I wish to confine this lecture chiefly to a discussion of the rise and meaning of ancient architecture. And I shall use the term architecture in its most ancient and not in its more modern sense. No two meanings attached to the same word could well be more different. To the imagination of a man of the 19th century the word architecture conjures up a splendid vista of roofs and towers with battlements or spires, castles and churches, palaces and stores with marble fronts and decorated windows from the pavement to the eave ; parliament houses and city halls in parks laid out for public recreation ; hotels of a thousand separate rooms ; vast railway stations, each blocking up the end of some wide avenue, one exit of the city with long hanging vaults of wood and iron under which interminable trains of cars may load and unload thousands of travellers ; factories, mountainous piles of furnace-stack and hollow archways, girt with gigantic flues and capped with curious brickwork, black iron cylinders vomiting fire, and taller chimneys smoking in the upper air ; bridges like spider-webs and viaducts with wonderful arcades spanning the streams ; observatories crowned with domes like eastern mosques ; theatres and halls for music with organs seeming like the slumbering winds of Eolus waiting to rouse the world ; great, many-storied public schools, each with its tide of life ebbing and flowing with tumultuous regularity four times each day as if they were the ventricles of a great nation's heart : all these and innumerable private residences and villas urban and suburban, in

streets, on hill-tops, and beside the shore, or buried in sweet vales; all these combine to make up architecture now.

In ancient times it was not so. The so-called ancients, Greeks and Romans of the times of Christ, only 2000 years ago, they had their architects for triumphal arches, aqueducts, bridges, forts and palaces, as well as for religious shrines. Even the Assyrians and Babylonians of an age a thousand years earlier built palaces as well as temples; if their palaces were not indeed their only temples, as their kings were named after and worshipped for their gods. But in the real old ancient times preceding all those really modern or grandly mediæval histories, I mean the times of ancient Egypt, the times when British Stonehenge and the Armorican Carnak and the North African cromlechs and the Cyclopean walls of Italy and Greece were built; in those old days there was nothing but religious architecture. The people lived in tents or cottages. Their kings were merely chieftains, heads of tribes, living among their people like Arab sheiks, or like the kings in Western Africa. How many ages from the beginning passed before the building of temples began, we cannot know. All before the rise of architecture was an age of unconscious art, mixed with uncertain superstitions; an age of fetichism with its vulgar sorceries, like those which form the sole religious ceremonies of our Esquimaux; and with its rude stone idols, wooden painted posts, sacred trees, haunted mounds and amulets.

The original root of all architecture can be found in the sepulchral mound. The Druid barrow or the Tartar tumulus became first the pyramid, then the propylon of the Egyptian temple, then the pagoda of India and China and finally the Parthenon and Pantheon of Greece and Italy. The pyramids of Nubia and Egypt, with one exception and that one not undisputed, are undoubtedly the Mausolea of the early Pharaohs; while all the other primeval Egyptian monuments are private tombs. The earlier Egyptian temples were avowedly erected in honour of deceased monarchs by their sons. The custom was transplanted from the soil of the valley of the Nile to all surrounding lands. The Mausoleum at Halicarnassus in Asia Minor was one of the wonders of the world. No trace of it re-

mains. But the vast tomb of Massinissa in Numidia 200 yards in diameter and the tomb of Hadrian at Rome still challenge the admiration of mankind. But why select examples here and there when the grave-mounds of forgotten princes covered the entire surface of the earth, and furnish to our antiquaries their oldest and most precious curiosities. Nor is it needful to go back to the youthful days of Mizraim to study fragments which escaped the iconoclastic hammer of Cambyses only to be submerged by the Libyan or Arabian sands. The greatest living empire of the world is to-day practising and illustrating throughout its 16 provinces, each one a mighty kingdom in itself, that architecture of ancestor worship which, having antedated, will survive and swallow up all other works of men. The tombs of the Ming dynasty near Peking show that the self-same sentiments and ideas continue to rule the human heart and direct the artist's hand which called into magnificent existence five thousand years ago the Colossi of AbuSimbil and the Necropolis of Thebes. A thousand things in Chinese life impress the traveller strangely with the devotion of the entire nation to these tender and reverential tastes and feelings for the dead. To the father nothing is refused. The most acceptable present that a son can make him is a coffin. He knows that death will be no bar to his advancement in honours, for the merit of his child will illuminate his name. Nobility is not prospective but retrospective in the Central kingdom. The hero's deeds, the sage's wisdom, the statesman's success ennoble not his descendants but his ancestry. The degenerate barbarism of Europe has substituted the sordid interests of property for gratitude and piety.

Ancestor worship, or the homage which the living offer to the dead, is not only the most extensive but the only universal form of religion upon the earth, and the oldest of which any traces remain in early history. It was natural, therefore, that the first tomb should be the first temple, and *vice versâ*. That desire to live which was given to mankind in common with the other animals as a safeguard to his life contained within it germs of thought and sentiment which were in process of time developed into a thirst for immortality. This caused the living to erect their own tombs; and civilization has done little to change the

ancient custom. True, circumstances may render individuals reckless, and if long enough adverse and charged with sufficient misery may even obliterate from families and tribes the acquired instinct of ancestral worship. Livingstone represents the Makololo as totally careless about the bodies of their dead and hostile to every remembrance of their past existence.* Yet such are rare exceptions to the general rule.

In ancient days the father was not only the giver of life but the lawgiver who could order it away. Abraham sacrificing Isaac to Jehovah, or sending away Ishmael and his mother into the desert; Jephthah paroling his daughter for a month; the king of Moab slaying his first-born on the city wall in sight of the hosts of Israel:—we read these stories so often that they cease to make their natural impression on us. The ancient father was in fact both family priest and king; and when he died he became the family deity. The chief of a tribe was but the greater father of a larger family; and when he died a grander fane arose in homage of his power and virtues. I am not one of those who entertain the theory that all the deities of ancient times were monarchs or benefactors or emigrating chieftains deified. No! the worship of a man ceased with the generation who succeeded him, as only one pope at a time can occupy the sarcophagus over the doorway in St Peter's. But nevertheless there is no denying or mistaking the combined action of the two causes which I have just named upon the rise of architecture, viz. the man's own desire for an eternal mansion, and the honours which his children voted him.

The most ancient specimens of architecture whose date we know are certain tombs of Memphis which M. Mariette has recently uncovered from the sands of the great plain, on the edge of which stand their next descendants in architectural age, the pyramids. These tombs were built originally like the houses of a city in rows, separated by narrow streets, some of which are cul-de-sacs or courts. The tombs themselves have all one form, that of a small pylon or truncated pyramid; the façade, or front towards

* See Livingstone's curious account of 'hiding the dead' on the Zam-besi.

the street, decorated with long prismatic mouldings, terminate in lotus leaves tied together by the peduncles. This is M. Rénan's description and he refers for illustration to Lepsius' *Denkmaeler aus Ægypten und Æthiopien*, prem. part. pl 25, 26. You will hereafter see the importance of this ornamentation to a correct theory of architecture; but at present let me continue the description of these interesting monuments. The door of each tomb is very narrow, and never in the centre of the front. Over it is cut the hieroglyphic guitar, a cylindrical drum or tabret, carrying the name of the dead. Here he lives for evermore, always at home. It is his 'everlasting home,' the very term the old Egyptians used to designate a tomb. And the interior arrangement agreed with this idea. It was arranged for the reception of his surviving friends on certain days of the year. Therefore in the oldest times—at the extreme dawn of history—the first—absolutely the first scene which is presented to our eyes is precisely that which the modern traveller beholds when he visits on All Souls' Day the Parisian cemetery of Père la Chaise, or the tombs of the Ming dynasty near Pekin. Ancestral worship was the first and will be the last religion of mankind.

Entering now one of these old Memphite tombs one sees engraved upon the walls the master of the house in the bosom of his family; his wife, his children, his servants, his scribes, his household furniture around him. His own portrait in bas-relief occupies the post of honour and is commonly repeated in several places; while a large stele or obelisk-like pyramid gives his titles and sometimes his biography, his characteristic traits, even his infirmities, to ensure the continuance of his personality. How strong must have been the lust for immortality which ruled the breasts of those old people! I mentioned in a former lecture with what detail the agricultural habits and manners, tools and animals of this primitive Egyptian race was given in these family picture-galleries; and how no trace of war or of religion is apparent in them.

This we must dwell on here a little, not to discuss the origin of the religious sentiment or its realization in worship, to which I shall devote a future lecture, but for the

bearing of the fact upon the theory of architecture. In these tombs we find, I say, no trace of those chapters of the ritual of the dead, which under subsequent dynasties of kings and priests in Egypt came at last to constitute the obligatory ornamentation of all tombs.* In the ancienter times of the Memphite tomb-builders the deity seems to have had neither name nor image. The dog Anubis, on whom the trinitarian spirit of a later date bestowed three heads, the Cerberus of Greek mythology, appears indeed upon the walls as the guardian or watchdog of the tomb. But where is Osiris—that special funeral god of the later dynasties? For these more ancient Memphite ‘everlasting homes’ he has as yet no existence. They are in no respects funereal chapels consecrated to a divinity. *Death* is the only deity acknowledged here. We are in the rear of all mythologies; behind the curtain the drama of religion has not yet commenced. We are still in the primeval age of man’s existence upon earth before the birth of kingdoms and priesthoods as we know those things; yet also at the end of that great age, just when it is about to breed another age and pass itself into its ‘everlasting home.’

But we have here true architecture and the fine arts

* ‘The tombs of Memphis are all dated in the six first dynasties; and without this they would still indicate their relative age by their style and the order of their ideas. Compare them with the grottoes of Beni Hassan (2500 B.C.) where the ideas are the same, death the only deity of an eternal home, a grand, gay chamber alive with pictures, but with neither superstitions nor terrors. Then compare them with the tombs of Biban-el-molouk, near Thebes (1500 B.C.), and see the sudden and complete change! A Christian and a pagan tomb could not more differ. The dead is no longer at home; a pantheon of gods have usurped his place; images of Osiris, and chapters of the ritual cover the walls; graved with a care as if the world must read them, and yet shut up in everlasting darkness, but supernaturally powerful. Horrible fictions, the foolishlest vagaries of the human brain. The priest has got the better of the situation; these death-trials are good alms for him, he can abridge the poor soul’s torments. What a nightmare is this tomb of Sethos! How far we have got from the primeval faith in death and survivance after it, without the ceremonial of the priest, or long list of names divine, ending in sordid superstition. One of our Gothic cathedrals differs less from one of the tombs on the Appian Way than do the old tombs of Sakkara from those which fill the strange valley of Biban-el-molouk.’ (Rénan.)

already born ; nay more, already perfect in one of their careers.

Nothing, in fact, would so thoroughly dispel the scepticism of religious people respecting the antiquity of mankind as a good examination of these monuments. They say themselves that they belong to the first dynasties of Egypt, and yet their construction is as perfectly beautiful as if they bore over their doors names of the monarchs of the 18th or 22nd dynasties 2000 years later of date. What is so astonishing, so bewildering, is this : that art and architecture *when we see it first* is in its full maturity. The painting, carving and building-arts (to judge by these Memphite tombs) have had apparently no infancy. And it is only by turning from Egypt to other lands, and from these wonderful treasures preserved beneath the sand to the cyclopean walls, to the circles of standing stones and to the Druid barrows that we are reminded of those vast stretches of time before Memphis and its people had existence, ages of night and wandering for races of mankind whose only monuments were some stray boulder poised upon a hill, or some smooth rock beside a stream on which they could engrave a few rude effigies ;—races which have all perished without one name engraved in legible characters ; without one shrine to keep alive the remembrance of a single deity.

But were we to dogmatise in this fashion about the early and sudden blooming out of Egyptian art or Chinese civilization as if they were created perfect and had no beginning simply because we can find no records of such beginning we must forget that a record is impossible without a scribe to make it. Mankind without arts have no means of recording the history of their arts. Art is a self-recording instrument indeed, but not until it is itself completed. And when we examine the Egyptian record a little closer we can perceive in it a confession of improvement and progress which relieves us of historical embarrassment. If Mariette can say of the fourth dynasty that its opening reigns yield us prodigies of an unexampled civilization, unexampled at that moment in the world, a society definitely constituted, a development of art at a height hardly to be topped by the most brilliant epochs afterwards, and an architecture elegant, he must add that

all this marks a sudden and extraordinary movement the cause of which is hidden from our research ; and we must remember that three dynasties had preceded, numbering as many centuries as have elapsed between the Norman conquest and the present day ; time enough one would imagine for the growth of all the arts and all the sciences.

It is admirable to see with what fidelity the builders of the Memphite tombs did all their work. It reminds one of the enthusiasm of the builders of the Middle Ages. And yet M. Mariette has distinguished in the early tombs of Egypt three classes. The most ancient, like that of Amten, exhibit art and literature in process of formation, the hieroglyphs widely separated (*clair-semé*) and in relief. Rude forms abound. The statues are thick and short, with all their anatomical details exaggerated. The second class, the best example of which is Ti's tomb at Saqqarah, are better placed, with hieroglyphs less boldly striking and more harmoniously grouped, making the text more legible. The alphabetic element begins little by little to substitute itself for the syllabic, which forms so large a part of the older legends. Ascending genealogies become rare. The formulæ of invocation are addressed to Anubis alone. The third class, contemporary with the 6th dynasty, begin to show the name of Osiris, and the formula of justification, in text more lengthened out, with beautiful forms of prayer and biographical recitals to vary a little the monotony of representation. In these, and in the tombs of the second class of the time of Ti, are found those beautiful and smoothly worked-out statues, with visage round and smiling mouth, fine nose, large shoulders and stout limbs which form so numerous and precious a collection in the Boulaq Museum. And in these tombs are also found those enormous monolithic *steles* cut into the form of a façade of which the Museum has so rich a collection also. These are, then, the three stages of the oldest Egyptian art. Then came a long break, perhaps the Dark Ages of the ancient empire. We pass down through five more centuries to the 11th dynasty, when a Renaissance appears, with Isis for its deity, and marks which cut it off from any direct inheritance from the art that had preceded it by so long an interval. The *steles*, formerly square at top, have

now become rounded. The hieroglyphics have a particular awkwardness resembling not at all those of the tombs of the 3rd dynasty. The sarcophagi are also different, and colours are in vogue. Then comes the splendid age of obelisks, colossal statues, grand grotto-temples, and all that make the borders of the Nile and Thebes the wonder of the world.

I once enjoyed the rare opportunity of getting upon the roof of the Sainte Chapelle in Paris in company of the architect to whom was intrusted the superintendence of its restoration under Louis Philippe. After I had feasted my eyes upon that glorious panorama—which I think is finer from this point of view than from the top of Notre Dame—I occupied myself with the bits of carving which surround the pinnacles of the buttresses and which are entirely invisible to persons in the street,—hundreds of leaves and flowers and delicate morsels of fretwork, which no eye had seen for centuries, even since the stone-cutters had hoisted the blocks unchiselled to their places, and yet as nicely wrought as if they were intended for the doorway in the porch. And I could not help asking myself the question, When will our architects get such a conscience as those old masons had? * And I wondered also when the time would come for a public taste impatient of our meretricious sham shop-fronts on Chesnut-street or Broadway, showing their ragged edges and unfinished cornice-ends and soft brick side walls up and down the street as shamelessly as harlots in the evening flaunt their tawdry.

The old Memphite tombs were built to last, and to last beautiful. They were to be *homes* always. They bore no resemblance at all to our family tombs crowded with coffins, hideous with mildew and fungous vegetation, generating horrors of the imagination to be surpassed only by those which breed within the modern so-called Christian doctrine of eternal damnation. There is nothing to suggest the Columbaria or pigeon-cote burial-places of the Hebrews, Phœnicians and Christians of the Roman day; nor those vast catacombs in which whole congregations of believers in a future life were laid away to sleep together

* See Rénan's beautiful description of this perfect conscientious art, p 673 (Revue des Deux Mondes, 1st April, 1865).

until the archangel's trump should wake them up together for the judgment-day.

The Egyptian farmer's soul lived all alone in his 'eternal mansion.' Each tomb was individual. Except in some few cases even the wife had no admission with her husband to it. He was satisfied with her picture among those of all his other domestic animals. Except on the solemn anniversary the narrow door was shut, and darkness obliterated the pictures except to the departed ghost. He was supposed to regale himself with the offered fruits and cooked food which his friends left in his chamber. Some of these touching proofs that love and veneration have always swelled the human bosom have remained there untouched all those thousands of years until M. Mariette opened once more the doors.

But the prime point for our reflection is the fact that there is nothing of the tomb about these tombs; they are houses—homes. They feared but one thing—disturbance. With what horror must the ejection from his tomb have been contemplated by the old man of the Nile! The possible loss of his hereditary lands could not more shock an English nobleman. To be turned out and sent adrift homeless for ever, a poor ghost unable to build but once and never more! Imagine his feelings in view of such an irremediable and infinite calamity! I believe that these Egyptian sentiments, entertained as they were by all the early races of mankind, were the originals of all those superstitions of Hades and haunted places and uneasy spirits which exist to-day. How different the dying Christian's thoughts! To him there is no isolation in the tomb. He sees heaven opened, and flies to join the great congregation of the first-born in the kingdom of the Lord who rules the heavens and the earth under the new dispensation. And as the old Egyptians had the idea of immortality, so even the cave-dwellers of the south of France must have been led by it to make their burnt-offerings to the dead, as M. Lartet has shown. The peculiarity of Christianity consists in the fact that it was both *life* and immortality which were brought to light by Jesus Christ.

The care with which the body of the dead was preserved in a sarcophagus,* and the care with which the sarco-

* The sarcophagus is an immense cube of granite or white marble, the

phagus was concealed in a chamber of its own nearly 100 feet underground, approached by a well sunk in the thickest part of the masonry, and then by a horizontal gallery so arranged as to make it extremely difficult to discover the whereabouts of the sarcophagus—all show how dreadful an idea the profanation or disturbance of his body must have been to the living Egyptian.* To derange his repose was to compromise his eternal salvation. How his body was to share in his soul's immortality perhaps was never a clearly formulated dogma in the Egyptian creed, if there was such a creed. But mummification became afterwards one of the fine arts and combined sculpture and painting with all the most shameless tricks both of priestcraft and of trade. It would be a perfect farce to tell you of the shrewd devices of the Egyptian undertakers in a later age, to say nothing of the grim mistakes which have been made in lecture-rooms in this country. I remember when a mummy-case purporting to be that of a Pharaoh's daughter was solemnly opened and unwrapped before a crowded audience; I think Mr Agassiz was present and took part in the proceedings; the case contained the body of a boy, and nobody has ever been able to explain the misadventure, except on general principles—that the Egyptian undertakers were great rascals.

In the earliest times there were also images made of the deceased, but they were exquisitely well done, and the sole intention seems to have been to preserve the personal identity of the departed, to make sure that his ownership of his own 'everlasting home' could always be identified that no false claimant might ever eject him from it. These images are now found concealed in little wells in the masonry of the tomb. The number of them already collected is

walls of which are sometimes decorated with prism-shaped reeds (rainures), and other ornaments analogous to those of the façade of the tomb.

* The same spirit presides over the queer construction of the pyramids. Each was the inaccessible, eternal home of a king. Their entrances were never in the middle of a side, and carefully sealed up. The galleries within were filled with rocks, from the tumbling in of the roofs, after accomplishing which the workmen escaped by curiously constructed shafts of exit. These precautions were so successful that the chamber of Cheops was not reached by any explorer until the days of Caliph Mamoud, 5000 years and more after it was built. (Rénan.)

very great. Some are of wood, some of granite, some of marble. One, to be seen in the Museum of Charles X* represents a scribe, executed with the minute finesse of a

* Museum of Boulaq. Some are in the Louvre. 'It is ugly, common, vulgar assuredly, but nothing ever came up nearer to the intention of the maker. It is an unequalled prodigy, this wooden statue of the Museum of Boulaq, to which the fellahs gave unanimously, on its discovery, the name of Scheickh-el-bilad, "The Village Sheik." It is the statue of a certain Phtah-sé, cousin to the king. His wife's statue was found near it. The expression of naïf contentment spreading itself over the smiling figures of these two good folks is plain enough to see. One would call them two Dutchmen of the times of Louis XIV. One may not doubt, looking at these statues, that before the period of royal despotism and sumptuousness, Egypt had an epoch of patriarchal liberty. The pompous official art of the Thouthmes and the Rameses did not lower itself to represent such *bonhomie* any more than the artists of Versailles bent down their dignities to paint "Magots" (boobies, puppies). In fact these two astonishing *morceaux* are of the 4th or 5th dynasty. Will you say that here we have primitive art starting on its career with such minutiae? Consider first, I pray you, that Egyptian art was not at its *début* but in its perfection then. What is most extraordinary in this civilization is, that it had no infancy. We seek in vain for an archaic period of Egyptian art. In architecture that is easy enough to understand, for it finds the means of accomplishing its desires commonly much sooner than the plaster arts can do it. But for sculpture to divest itself of all rudeness and awkwardness centuries are requisite. Greece, Italy of the middle ages, prove it. But such a statue as that of Chéphren, of which I shall soon speak, and all the statues of the ancient empire, are not at all in the style of a middle age. They have a definite style of their own. Viewed as to the measure of the nation's genius, they could not be done better. Egypt in this, as in so many other things, contradicts the laws we assign to the Indo-Germanic and Shemitic races. She begins her career, not in myth, in heroism, in barbarism. She is a China, born mature, almost decrepit, having always had that air at once of infamy and age which her monuments and her history reveal. The divine youth of the Yavanas (Ionians, Yavanasdones, the youths, Juvenes) was ever unknown to her. That she started with realism, with platitude, does not amaze me more than that she started with good sense, good domestic economy, the right sense of worthy farmers, knowing exactly the number of their geese and asses. We are not here on the soil of Homer and Phidias; we are in the land of clear and rapid conscience, but limited and stationary. Solon's priest of Sais thought himself sarcastic when he said, "You Greeks are babies; there are none old among you; you are all young in spirit:" but it was the profound error of a narrow-minded conservative, proud of that which marked his own inferiority. It is permitted man not to be always young, but it is needful to have been young once. These intelligent guardians of dead letters could not see what made the force and beauty of Greece, as many a heavy spirit of our days thinks that he has exhausted language against France when he has affixed to her name the epithet of revolutionary.'—Rénan.

perfect realism which refers us to more ancient times when savages criticised the forms of nature with no æsthetic sentiment but with the interest of life and death. Hence we have in these images an ethnographic precision like that of Chinese or any other cultivated but unideal art.

Let us reflect a moment. Wherein does the savage of primeval times most differ from the philosophic citizen of modern Boston? Is it not in this—that life and nature and art and thought were to the savage man all in detail; but to the civilized are in the general? As the savage spent his time alone, spearing one fish, luring one bird, trapping one animal, whittling out one arrow at a time, measuring the ground with single paces, skulking from tree to tree and stopping behind each—so all natural and primitive art must be detailed, precise, and characteristic of single individual forms and movements. We on the contrary, we civilized people, live in crowds. Our cities are aggregates of houses, even with walls and roofs in common. Our furniture is made by machinery and shovelled into our life by the million. We have lost all idea of distance in miles and furlongs, like the Irish woman from Boston who refused to believe that she had arrived at the West Newton station-platform, protesting that “if she’d ha’ known it wasn’t any further than that she’d ha’ walked.” All our thinking now is done in generals. Science is merely generalization. Hence our *art* has become *abstract* also. The feeble attempts of the Pre-Raphaelites only show how utterly disagreeable to the genius of our day would be a return to the individualization and characteristic detailed particularity of the first stage of Egyptian art; when every man built his own tomb and every image in it was an exact, unflattering, conscientious portrait of himself.

One more reflection before we proceed. The science of the fine arts is the science of beauty, taste, an appreciation of the fitness of things, harmony, proportion, symmetry or rhyme, and alliteration or rhythm—that law of all laws in the Cosmos, the law of pulsation, vibration or paroxysmal repetition. Now, why do we never expect taste from a savage; and why do we count taste among the prime *criteria* of good-breeding? Ethnologists have laid down a rule for themselves in estimating the relative antiquity of

their discoveries. If the objects which they find are polished, they consider them comparatively recent; if ruder, more ancient; if very rude, primeval. But what right have they to establish such a canon? Are there not bad masons a plenty laying up tumble-down walls to-day; and miserable sculptors cutting thousands of horrible tombstones for Mount Auburn and Laurel Hill which they expect the world to call fine monuments? What is the ground for this distinction between rude and polished art? I will tell you. The savage has bad taste, because taste is that faculty which deals with the true relationships of things. Knowledge therefore cultivates Taste; and the savage is ignorant. Not the knowledge of things in detail, but of things in their relationships. Nature deals in what we call delicate touches, and these require sharp eyes to see—loving, patient, educated eyes. This is why sorrow refines the soul. Sorrow is ejection from self into the world's wretchedness; the hurling of the soul from its vantage tower of isolation down upon the hard pavements and among the hostile crowds below. Sorrow, disaster, teaches men strange bed-fellows, enlarges their comprehension of the worlds in which they live and so refines them. But even this source of refinement the savage has not; for his sorrows are solitary; his woes annihilate him like thunderbolts; he perishes too easily; there are no ameliorations in his lot; his taste continues hard, for he has nothing about him but the raw stuff of nature, inexorably cruel to him, playing with him as a cat plays with a mouse, and only now and then grimly laughing at him through some odd antic or queer shape of the animal or vegetable kingdom. His imitations therefore of nature must be gross, rude and individual. He has had neither eyes to discover nor tools to imitate those combinations of force and form which constitute nature; still less the taste to feel those delicate ideals of all forms, those Ariels of the tempest of this earth-life, floating high before the soul, and beautiful, and musical as beautiful. *These* are the spirits of our architecture. These were the genii of Phidias and Praxiteles, the Prosperos of that magic Isle of Art, at whose command sprang up the divine porticoes of the Parthenon—that Miranda of the Island; and the three thousand statues of the Olympium at Elis—that synod of all man's exquisite

imaginations, that symposium of all forms of strength and beauty realized in marble, ivory and gold.

But even Greece was not well bred enough to comprehend the grander combinations of a later day. It needed the marriage of the Classic and Teutonic races to produce the Gothic cathedral. And when the time was fully come, and that wondrous world of reeded piers and skyey arches, buttresses and pinnacles, towers and spires, in combination, like the solar system, or the framework of the Christian church, rose above the grave of Ambrose bishop of Milan, see how those three thousand deities of ancient Greece rose too from their old seats in Elis and flew to perch upon its pinnacles. Painters came journeying from every side of Christendom to hang their histories of angels, saints, and martyrs on its piers. Musicians choired for ever in its chapels as naturally as nightingales collect among the copses of the Rhine. Kings, dukes and merchants built between its buttresses their tombs, or decorated shrines to their tutelary saints with offerings of every precious stone and work of art whatever they could find or buy or steal to save their wretched souls. Emperors hung up along its vaulting naves the tattered ensigns of their vanquished enemies. Pilgrims returned from Holy Land and poor pale women convalescing from some desperate malady, placed there their shell and scrip or votive wax light or bouquet of artificial flowers. In times of war and pestilence the multitude from the surrounding country rushed to the cathedral church as their sure ark of safety. God shut them in. The deluge might rage outside; but they were safe. They called it therefore going into the temple Nave, from *navis*, the Latin word for ship. The old Greeks had the same name for a temple, Naos, because *naus* was the Greek for ship. Architecture was to the ancients not the building of arches but of arks, into which the suffering crowds might be led when troubles rose upon the earth and men despaired of living.

Around the cathedral the whole religious hierarchy organized itself. On one side stands the baptistry by which the ark is entered spiritually. On the other stands the chapter-house where laws are made to govern the church and regulate its services. A covered way in one direction leads to the archbishop's palace, full of noble

guests from every land. In the other direction stretch the cloisters of recluses, automata by which the ceremonial goes on with all the rhythmical steadiness of planetary motion; or learned men who keep alive the old traditions of it; or charitable men busy about the hospitals and at bedsides, almoners of the Church's charities, or preachers to the poor and hard-worked million. Then in its vaults we have more relationships—these with the past; sarcophagi of founders, builders, restorers, rulers of the Church; the relics of the saints; caskets of precious jewels; boxes of gold and silver plate, rich vestments, wealth bequeathed for the care of its roof and walls and all its numerous uses. If we ascend its staircase we may find within its roof a little village of carpenters, masons, plumbers and glaziers always occupied in keeping the vast edifice in good repair, —for it is mortal like other things in this world, and if unwatched would fall piecemeal and crumble (like some tall cliff or mountain cedar) into the dust again from which it rose. Happy the ancient Memphite tombs over whom the sony sands were spread like a bed of snow in winter to protect the grain for spring.

I have given you this picture of the architecture of what we misname 'the Middle Ages' (but which are, as to the whole world-history of man, the modern times in which we actually live) in order to show that the development of art consists in these complex relationships; that a cathedral temple has grown up like a mountain mass, by the addition of layer upon layer, formation upon formation, all different and yet closely related; by successive additions of great ideas—ideas bred of civilization, of many superimposed civilizations; ideas produced by the conflux of human interests; correlated ideas of state policy, religious sentiment and family interests. And as it required the varied experiences of many ages and many races to combine in one great monument the parts of a cathedral, so it requires in the spectator a life rich in these ideas to appreciate and admire such a monument.

The traveller must have travelled much, read much, been greatly conversant with human things; swept with his own experience through a wide circle of adventures; grasped the meanings of many social and political phenomena, and undergone great revolutions in his own soul—

or he will walk through the solemn aisles as a brute beast grazes heedlessly among the grandest and most beautiful scenes in nature. If he be a narrow bigot, he will look on all the symbolic devices around him as a vulgar raree-show and scoff at the great temple as a house of idols. If he be a petty shopman, he will merely price in his own sordid mind the money value of the golden censer and the marble tomb. If he be a mere political economist he will murmur at the vast and useless expense of walls and arches, towers and pinnacles, as Judas Iscariot did of old when the woman broke her alabaster box of precious ointment to pour its contents upon Jesus' feet. If he be a mere statesman and a democrat, he will bluster over the despotism of priests, the selfish pride of princes and the beggarly self-indulgence of the monastic orders. If he be a mere painter or sculptor uninstructed in the greatest thoughts of all ages, he will occupy his narrowed taste in paltry criticisms upon this or the other work of art; carp at the architrave mouldings, complain of the want of symmetry between the more ancient Norman nave and the more modern pointed Gothic choir or draw detracting comparisons between the façade of this and of some other temple which he fancies rather. None but a noble mind enlarged by the influx of all the past can comprehend a great cathedral and the genius of its architects.

A savage cannot do this. He is stupified by the incomprehensible. The cockney Englishman—the raw American grown suddenly rich by some infernal speculation—such men tramp through Europe like the Goths and Vandals from the forests of ancient Germany. They read no story in its monuments. They sail up the Nile, and although its granite walls are covered with writings these are blank hieroglyphics to such eyes. It is not seeing much that gives man taste or knowledge: it is seeing the relationships of things. Better see a few fine specimens and analyze and comprehend their relationships than see all things with an unenlightened, unreflecting eye. Napoleon said it in his famous sentence: 'Soldiers! forty centuries look down on you from the pyramids.' The Anglo-Saxon calls that bombast. No; none but a Napoleon would have thought of such an apostrophe. The past reflects itself in the world's monuments. It is the com-

monest event to hear a stupid Englishman pride himself on his nonchalance for ruins. Why? because he is ignorant of history; he sees no true relation between a crumbling ruin and his own well-upholstered drawing-room or smoking-room or billiard-room at home. And yet had not those ruins been he had never been the comfortable, careless, arrogant, impertinent Anglo-Saxon gentleman he is.

I have heard this story told of a New England clergyman; perhaps some of you may have heard it told of some one else; it may be true or false; but it illustrates what I mean to say. Prying about the island of Malta to discover the scene of St Paul's shipwreck he noticed an English officer standing in a doorway and addressed him with the question: 'Pray, sir, can you inform me where the Apostle Paul was shipwrecked?' 'Ha!' was the fierce and quick response. The brother meekly repeated the question: 'Can you tell me where Saint Paul was shipwrecked?' 'No, sir! we want none of your damned conundrums here!' The soldier had probably never heard of the event so full of interest to the clergyman; or if he had, had never thought of modern Malta being the Melita of Scripture history. In fact, all history is a conundrum to such men. Savages have no history at all.

Everything in mind, in taste, in generosity, in liberty of one's own soul, depends upon the view we get of great relationships. This is why the highest prospects please us least in travelling. The view from the summit of Mount Washington is far inferior to the views we get from many of the lower summits of the White Hills. We see an immense panorama, but reduced to one dead level and removed from accurate inspection. We must get some standing-point whence we can see the true construction of things. *Con*-struction, not structure only. We must be able to tie this and that together, glance up as well as down, get many vistas in many directions; see how the snow feeds the glacier and the glacier breeds the river and the river waters the vale and the vale debouches on the plain.

The finest view I know of in the United States is from the summit of Penobscot Knob from which you look down upon the valley of Wyoming. You see the whole geology of the region at a glance—the Third Anthracite coal

basin with its rim of conglomerate—the long canoe of the Upper Devonian mountain inclosing it on each side and at the ends—outside of which spread out the Middle Devonian valleys. Far to the north stands the great wall of the Alleghanies, with the edge of the First Bituminous coal basin on its summit. As far to the south the Beaver-Meadow mountains spread themselves against the sky, bearing up the basins of the Second Anthracite Coal Field. Through a bold gorge you see the broad sheet of the Susquehannah river come winding superbly in among the corn-covered plains of Kingston in one direction and sweeping majestically out again through a second gap towards the west; then for the third time striking across the canoe between grand cliffs it passes on towards the sea. Close by, in the centre of the fertile fields of the valley, glitters the beautiful little city of Wilksbarre. Beyond it, on the Kingston side, a small grey monument rises to mark the place of the old story of the Indian massacre and brings to mind the verses of the poet Campbell. On the same northern bank of the river, a little farther down, you may perceive where men have opened up an Indian graveyard in grading for a grand trunk railway to connect the mines and carry off their produce to New York. A hundred collieries with their tall chimneys and huge breakers (those curious institutions peculiar to American collieries) remind you of the genius of the present day. The hum of many trains fills the air. Just at your feet burrows a deep ravine, with a fine water-fall; and on a plot of grass beside it is a pic-nic party of smart shopkeepers and pretty girls who claim descent from the Connecticut settlers four generations back. Passenger cars are being dragged up by three incline-planes to a water-shed four hundred feet below you. But, see! A thunder gust is coming up, bred in the Buffalo mountains which bound the far-off western horizon. It spreads its great black wings to the right and left, laying its thundering bosom on the Wyoming mountain as it rushes on towards you. You stand upon a natural plate of rock on which you notice marks not made by man, nor by the common elements—long, parallel, straight lines—*diluvial scratches* they are called. You may observe they point across the valley, beyond the city and the river and the monument precisely

towards the gap in the Schickshinný Mountain opposite, through which the river breaks at Campbell's Ledge. A geologist will tell you that these scratches were made by glacial ice coming from Canada. The glacier, entering by that gap, must once have crossed and filled the valley and so flowed on, southward, over the mountain top on which you stand. And this, of course, innumerable years before the Red man had discovered how to harvest maize upon those bloody flats.

But, tell me! were the Indian to return and seat himself upon this eminence, would he see all this? Or, would a Hebrew dealer in old clothes? Imagine a savage happening here when all beneath his eye was an unbroken wilderness, before a ship had crossed the Atlantic or a lump of coal had been inflamed; and then imagine Sir Charles Lyell, or Henry D. Rogers, or James Hall, or Sir William Logan assembling there around him a knot of geologists, politicians, historians, engineers, artists and poets; Longfellow and Emerson, Bancroft and Hildreth, Trautwine and Haupt, Bierstadt and Church, Charles Sumner and Wendell Philips, Treasurer McCulloch and Chief-Justice Chase —if you would comprehend how wholly the sentiment of the beautiful and sublime depends for its aliment upon the knowledge of relationships: and then you can also comprehend how the architecture of our modern days, how the grand architecture of any past age which had one, needed times and revolutions and the unfoldings of all human passions and the realization of all human ideas to have an existence even in possibility.

Savages have no art, no architecture, because they have no eyes except for food and danger; because they take things seriatim, each unrelated to the rest. Two sentiments inform the savage mind: death and the love of parents. These produced the earliest art. Their ancient gods were things which threatened death, and persons who bestowed and protected life. Ancestor worship, therefore, or the burial and after-worship of the parent by the child, and of the chief or petty king by his tribe or subjects, constituted the first of all religions; and tombs gave origin to all architecture.

I have made this long digression for the purpose of clearing the way to some correct theory of architecture; with

no intention, however, of dogmatizing against other more or less accepted theories which do not seem to me so probable, but which, nevertheless, claim more than a passing notice; although I think that I can show that, while they draw attention to some important points in the history of architecture, and to a certain extent explain some stages of its historical development, they offer no sufficiently broad explanation for the great mystery of its original inception in the human mind.

The first of these sub-theories, as they may be called, supposes that the natural caves of the earth have furnished the first and principal suggestions of architecture. Those who adopt this theory point to the fact that the most famous ancient shrines of India, such as those at Elephantine and Ellora, are rock-temples, artificial excavations, or ornamented caverns; and that many of the ancient monuments of Egypt are tomb-temples constructed by driving horizontal caverns into the rock-walls of the Nile; and that most of the ancient temples of Greece and Rome were perfectly dark cells, square, or oblong, surrounded by columns; mere imitations in the open air of the dark rock-temples of India and Egypt. The body of a Grecian temple is called its *cella*. But it is not a certain fact that the rock-temples of India are its most ancient edifices; the topes of the Jains are probably some of them much older. We have lately been informed of the existence of temples built in the open air near Memphis much older than all the known cave-temples of Upper Egypt. In China we have no evidence of any such antiquity in the case of rock-temples; and in Europe and Africa all the most ancient Druid monuments are either barrows or ranges of standing stones set up in the open air. If then we can discover some other and better reasons for the darkness of the Greek and Roman temple *cella*, the theory of which we speak loses its principal support. Here Geology comes to our aid and tells us that the earliest places of human sepulture were natural caves, ceiled up to eternal darkness. Afterwards, when men became partially civilized, they excavated artificial caverns for tombs; but left them unadorned. At the next stage of human life upon the planet these cave-tombs were ornamented first by painting, and afterwards by sculpture more and more elaborate. At a

still later age mankind began to erect tombs in the open air, especially on plains, near the great cities, far from any rock-walls or mountain-sides, and still they built them dark. Thus we arrive at those great monuments, the pyramids. To these, at length, they added porches and porticoes, such as you see in front of the Second Pyramid. And, finally, these porticoes suggested the construction of temples separate from the tombs; and thus the complicated and elaborate system of more modern architecture took its rise.

The second theory which I will mention has fewer advocates. It supposes that the idea of grand architecture arose in the human mind from beholding those great ranges of natural basaltic columns which are common in volcanic countries. The advocates of this theory are obliged to rely almost entirely upon the classic styles of architecture for its support. They point to Doric and Ionic façades, and the splendid peristyle temples of Greece and Italy. But it is only necessary to call to mind that the earliest temple of which we know, namely, that one lately opened up by Mariette, at a distance of 30 yards south-east from the great sphinx, has magnificent ranges of columns in its *interior*. That it was built by the king I have named, Chephren, the third king of the 4th dynasty, and therefore almost at the opening of ancient Egyptian history, is proved by a multitude of facsimile statuettes found in a well attached to it, all of them stamped with the name of that monarch in a cartouche; in fact, the earliest specimens of sculptured figures, with dates upon them, yet discovered. It is built in the form of the letter T, and its immense roof is sustained by two rows of huge, square pillars of rose granite along the nave, supporting an architrave of alabaster; while a third row of similar pillars runs along the middle of the transept. Its immense age and the unsophisticated manners of that earliest day are signalized by the severity, the methodistical simplicity of the whole interior. Not an ornament, not a letter is to be seen; and it confirms an incidental assertion of Strabo, that in Egypt there used to be temples of a barbarous style, supported by rows of columns, and wholly unornamented. I will explain, in a future lecture, his epithet 'barbarous.'

The rock-temples of India also, although of far inferior antiquity, are supported within by rows of columns elaborately sculptured. Why should we suppose the early architects were necessitated to copy the rare instances of fine basaltic escarpments, when the necessity for pillars to support a roof arises immediately from the enlargement of the cave. The transition from columns within to columns without the temple is the easiest imaginable. But we will find other reasons for rejecting this theory when we come to consider the idea of the column itself, which stood to the ancient mind for a symbol, quite apart from the temple. The column was a divine statue,—a deity. It was so in all the early ages, to all the ancient peoples; and it was magnificently so employed, with finer and finer effects, as mythologies were born and married to each other. The standing stones of the Druids; the Lot's Wives and Weeping Niobes of the poets; the straight processions of deity-headed pillars at Carnac; the range of eight Doric columns before the Parthenon; and the circles of twin-columns in churches of a later age, were all generated from the myth of men and women turned to stone, termini and Caryatides, gods and priests, standing gigantic and solemn, in orderly silence, within or around the temple of the deity. The proofs of this assertion are too voluminous to lay before you at the end of a lecture; but no true generalization upon ancient art would be half complete without its distinct recognition.

There is a third theory which I must allude to briefly, because it has obtained many supporters in England, especially since the discovery of the Lydian and Carian monuments in the early part of this century. It supposes that all ancient architecture originated in an enlargement to public purposes of the private cottage. The theory depends almost entirely on Grecian art for its illustrations, and therefore is of very limited scope, neglecting most of the architectural records of Asia and Africa and Western Europe. It relies upon the form of the Grecian pediment, and the ornamentation of its architrave. The Greek builder was under the necessity of roofing his temples against a northern sky. Snow fell in Greece, and the pitched roof and over-hanging eaves were necessities. These were supported by horizontal beams, like a fisher's

hut; the ends of the beams stuck out, and were split by the weather; the rain-drops stood in beads below their edges; hence the Grecian triglyph ornaments; they were mere representations of the beam-ends and rain-drops in stone. Just so you will see long dental shadows cast from the alternate projecting tiles upon the side walls of the houses in Southern France, and then these shadows imitated in stone around the eaves of the Cathedral Church of Toulouse. But suppose all this true, it is only the history of one part of the ornamentation of one style of architecture, and that of a very recent age. The great Doric temples at Pæstum are supposed to have had no roofs, and yet they had end pediments. Besides, the pediment itself is a religious symbol, apart from all necessity for a roof. It represented the pyramid, as the column represented the obelisk. In the pediment the Greeks placed the statues of their gods. It was their Olympus. But the Greek gods were men of a still older time, and the Greek pediment had come to be the Olympus of their gods, only because the previous pyramids had been the tombs of kings. And so with the architrave under it. It was not the string-piece of a house, laid on the top of a wall to sustain the roof; it was a separate and ancient symbol by itself; it replaced in the modern Greek art the far more ancient flaring cornice and cord-moulding of the Egyptian temples. In fact, all these theories, based upon the local styles of Greece, have lost their credit with archæologists since the discovery of the so-called 'proto-doric' style of Egypt. The Greeks got all the essential ideas of their Doric architecture from the ancient Egyptians; and all the variations of it which are called Ionic from the ancient Babylonians and Assyrians. This is now so well made out that it is a generally accepted truth.

The last and fourth theory of the rise of architecture which I need mention is still more local in its application than the preceding, and therefore as a general theory still less acceptable. It supposes that the first idea of grand architecture came from the woods; from overhanging trees forming long, lofty vistas to the eye, closed at the farther end with interlacing boughs and leafy tracery. Behold a Gothic church! See how its piers arise on either hand like mighty trees! See how the ribs meet over-head!

See the west window with its hundred mullions ! What can be more evident than that the architect had trod the forest aisles, and built them o'er again in stone ! It is a pity to retire from such a phantasy. Nor need we. The last of all architecture must not only include all that went before it but involve new elements of beauty. The free-masons of Germany and France were princelike poets, and they introduced into the grim conventional grandeurs of the Egyptian art and into the cold perfect chastity of Grecian art sweet humours and warm blood fresh from the heart of nature. They were Christians ; while their Grecian ancestors were pagans ; and the old Egyptian fore-runners of all were dwellers in the tombs. They broke up the massive piers into reedy clustered columns and shot their branching tops into mid-air to meet in bunches of foliage. They covered up the faces of the damned old gods of the box-shaped capitals with leaves and flowers so that the tender bosoms of their children might not heave with terror as they passed them by in advancing towards the altar where the Lamb of God was taking away the sins of the whole world. They let into the dark old tomb-like temple all the heaven of the sky, all the warmth of the sun with healing in its beams ; and painted the clerestory with a universal rainbow ; promising by all the angels, saints and martyrs in those windows that wrath should be forgotten. Then they went forth and built tall towers ; and from their tops shot spires far into heaven, covered likewise with angels and with roses ; and hung therein whole chimes of bells to drive away all evil and shower down in music the blessings of the upper and eternal spheres.

Thank God for these cathedrals ! And for their loving-hearted, large-souled, Caucasian Christian architects. They builded on the ruins of foregoing styles, out of the genius of foregoing days ; but in the new dispensation of a superior beauty and a diviner truth.

LECTURE IX.

THE GROWTH OF THE ALPHABET.

MEN must have lived a long time upon the earth before they invented an alphabet. It is a wonderful product of the senses, the fancy and the understanding co-operating. Its use by any people proves that that people has been civilized. If this be true now, it must have been true at the beginning. Thinking men set so high a value on letters that they have been disposed to deny man's genius the ability to invent them, and have therefore affirmed that God gave Adam letters in Paradise. But the genius of man, as it grew and developed its resources, was capable of all things necessary. If the creative plan, revealed in other parts of the creation, was to find its consummation in the development of human life through all its stages, upward to the highest civilization, then the germs of literature were planted early, and appeared in due time. The only questions modern science feels called upon to ask are: how? in what forms first? and afterwards?



I said, in my last lecture that the first efforts of mankind to express the æsthetic sentiments were made in the direction of sculpture and architecture, under the guidance of certain obscure ideas which I did not attempt then to explain. This I attempt to-night, because these same obscure ideas became openly and plainly embodied afterwards in literature. They decided in fact the shapes of the first letters, and the modes adopted by the earliest sculptors and architects for giving a plainer meaning to their images and temples. What I mean to assert is that the art of letters grew out of the arts of sculpture and architecture, and that we have no trustworthy clue through the mysteries of the

origins and growths of alphabets until we have learned to comprehend the mysteries of primeval architecture.

The first architects were beyond all doubt those religious teachers who civilized and intellectualized the races to which they belonged. Philology teaches us this much, if nothing more. The Greek word for a poet, ποιητης, involves the Greek verb ποιειν, to make or build. But the word poet is the same as the word bard, and the Hebrew word for cutting, carving, making, creating, was *Bara*. So the old northern name for a poet, *s-kald*, is represented by the ancient Egyptian words *s-kar* to cut,* and *s-char* to make. The old Egyptian word *bak* to carve, became in time the Latin *fac-io*, and the German and English *mach-en*. The high priest of Rome was called its *pontifex maximus*, or chief builder of arches or bridges.†

But there are other strange combinations of these functions of the priest and the temple-builder. The oldest Druid temples we know of are circles of stones. The Greeks called circles κυκλοι, dropping the *r*. The word seems to have been originally *kir-kir*, or κελ-κελ; for in all languages the letters *r* and *l* are confounded and exchanged one for the other. Now the oldest of all architectural edifices throughout the Mediterranean countries, except Egypt, are old walls and ruined buildings of immense stones, called Cyclopean. I cannot go into the discussion of the nature of the Cyclops, but I think it can be proved that they were the representatives in fable of the wild Druid priests of the circles of standing stones, like Stonehenge, from which we get our word for church, or kirk.‡ In archaic Grecian times all the poets before Homer and Hesiod were grouped into one class, representing a hoar antiquity. They were known as the κυκλικ (cyclic) poets, the poets or bards of the circle. The earliest of them all was called Arctinus, or the Arkite. Their themes were exclusively Arkite; their poetry is described by the Greeks

* Compare English 'to scar;' Welsh mountain-sides, *scars*.

†  *hs.* to sing, a bard. Man squatting, wrapped up. Sarcophagus of anχ-hepi. British Museum. Bunsen's Ideograph, 104. Compare Hs-iri, Osiris, and his picture, Ideograph, 130. The judge is still more strongly marked than the poet. He sits in a bath of water. He is called *stn*, meaning judge, one who hears truth. D. 34. Ideograph, 97. In Ideograph 27, the panther skin replaces the water. 

‡ See the whole discussion from Bozzel in Lemprière. (B. 52. 32.)

of a later day as rude, like that of the Welsh bards ; their style was Egyptian-like in its stiffness and severe simplicity. Their sphere of thought was bounded by the magic circle of primeval mythology ; their line vanishes into the dim background of Græco-Asiatic literature ; one of them, called the Ethiopian, sang of Memnon. They were entirely different from the poets who sang the wars of Greece : the historians, comedists and love-song writers of a later age. To the Greeks of Plato's day their poems corresponded to the Psalms of David in our sacred Scriptures, or to the hymns of the Rig-Veda in the Hindu Scriptures. When the Homeric scholiasts quoted them they simply said *εν κυκλω λεγει*, 'as it is written in the circle,' just as the apostles quoted the books of the Old Testament saying, 'as it is written in the prophets.'

Proclus thus describes the ancient Epic cycle. I give a free translation of his words : 'The Epic cycle is deduced from a mixture of heaven and earth, from which came three hundred-handed sons, and three Cyclopes. It briefly discusses gods and other fabulous things, and contains some history. It is ended by the labour of many poets at the murder of Ulysses by his unconscious son Telegon. Its hymns are still studied, not for the sake of virtue, but for the good order of its facts. And it preserves the names and countries of its bards.'

Let me give you one of those ancient sagas — the story of Pelops. 'In Sipylus in Phrygia there once reigned a wicked king Tantalus, son of Jupiter ; he had two children, Pelops and Niobe. At first the gods were his friends and feasted at his house ; but he committed two great sins, for which he was sent to hell, where he remains standing up to his lips in water unable to obtain a drop to quench his raging thirst, while a great rock suspended over his head threatens every moment to fall and crush him. His prime offence was that of divulging to mortals the secrets of the gods which he heard at his own table. His second offence was the diabolical trick which he played upon his Olympian guests in cooking his own boy Pelops and serving him up as a ragout to see if their omniscience would discover what it was they ate. Mercury restored the boy to life, but could not recover his shoulder, which had been already eaten. So he made the boy a new shoulder of ivory. His

fresh beauty now ravished the heart of Neptune, who carried him in his own golden chariot to the top of Olympus, until the rest of the enraged deities after a furious knock-down and drag-out fight in the royal dining-hall had settled his father's hash; then he was carried back to rule in his father's stead. His descendants for three generations reigned in Argos; that means the Peloponnesus (Pelops' ship, or Pelops' isle). And his bones were afterwards taken to Troy and became the Palladium of that unhappy town. His sister Niobe had all her children killed by Diana, and she herself was turned into stone and still sits weeping on a mountain in Phrygia.'

There is no disputing the theory that in all the items of this story (and it is only an example of the whole class of Cyclopean poems) there rules a reference to some original history *like* that which the Hebrew poets have embodied in the story of Noah and Mount Ararat. Tan-tal-us represents the TOR, or mountain, submerged to its very lips. The stone above his head is the ark about to touch the mountain-top. Tantalus is in Tartarus; is in fact the same as Tartarus, the place of Torture, the cavern in the mountain, the home of mysteries and horrors and woes, the hölle, hole, or hell of the Germanic nations. Niobe, the daughter of the mountain, is again the ark, turned to stone; her name, Niób, is the Egyptian word Θεβ the ark of Osiris, and the Hebrew word Theba, Noah's ark. The Greek TAURUS, a mountain, is the Arabic TEL or TOL, a mountain. But the Shemitic nations wrote all their words backward from right to left, and so this word TOL becomes LOT, whose wife (her name is no where given) was also turned like Niobe to stone. Pelops, Niobe's brother, was the Noah of the story. First, his father offered him up to the gods, as the Brahma of the Hebrews offered up his son Ikswaca (Isaac). Neptune, or the rising deluge, carried him up in the golden car (the ark) to the top of Olympus, until his father was destroyed, that is, until the Ararat was sunk to his very lips in the hell of waters. Then he was restored. His descendants reigned in Argos; they were priests of Arkism. He himself became the divinity of the TOR, the city of Troy. And so on *ad infinitum et ad nauseam*.

I did not intend to introduce the subject of mythology

so early in this course of lectures. It will claim our attention fully hereafter. But I am forced to it, in order to state clearly the true theory of architecture and the true origin of the alphabet. Architecture began with imitations of Tantalus and Niobe and Pelops in stone. Architecture began in attempts to build pyramids like Ararat, and to place upon their summits shrines of worship and houses of God symbolical of the ark. For this purpose islands were especially selected because they were surrounded by the sea. Sometimes even they were said to float, as in the case of Delos (TEL). The marshes of inundated deltas, the level sealike expansions of the desert sands, were equal favourites for building places. Where water could not otherwise be obtained tanks were dug, and in their centres pyramids and temples were erected. Especial use was made of every natural peak of rock around which the fluvial mud of some great river, like the Ganges, Euphrates, Nile, or Rhone, had settled; and on these the traveller is sure to see the ruined temples and monasteries of the old religions converted now into Christian churches, wherever Christianity has taken possession of the ground.*

Old books on architecture are full of definitions of this or that *style*. Until recently none but the so-called classic styles were recognized as genuine architecture. All else was merely barbarous. The classic styles were those of Greece and Rome—Doric, and Ionic, Corinthian, Tuscan, and Composite. But when Bruce and Belzoni discovered Doric columns in Upper Egypt, and Layard and Lassen Ionic capitals on the banks of the Tigris and Euphrates, writers on architecture began to take larger views of the subject. When Daniels published his magnificent plates of the Pagodas of India, and Kingsborough and Stephens made known to the world the Egyptian-like edifices of central America; when other travellers had brought to notice the monuments of Thibet and China, the immense statues and Cyclopean walls of the Pacific islands, and the Druid Tolmens of the Sahara desert,—then it became possible for Fergusson to write on architectural science a text-book

* The pyramid of Cheops is said to be built on such a rock. Another, a ledge of rock *in situ*, is seen in the floor of the Mosque of Omar. St Michael's Mounts. See the St George's of the Delta of the Rhone, &c., and those back of Arles.

as far in advance of old Vitruvius, as Lyell's Principles and Dana's Geology are in advance of the local classifications of Werner, or of Eaton's Manual.

Still the great *primal* principles of architecture, in my opinion, have not been clearly stated by any writer. We are bewildered by an ever-increasing multitude of pictures. We must give up for a moment the study of these details and take a more distant and summary view of the great edifices of the world, if we are to detect the aboriginal principles of architecture.

Let us select a Chinese or Thibetan temple, a Hindoo pagoda, an Egyptian propylon, and a Norwegian church, and set them side by side before us. Now the question arises, are there any prime or essential features common to them all? If there be, these common traits must give us some clue to the universal meaning of architecture, and therefore to its aboriginal ideas.

I will not delay you in the answer to this question. Look at these pictures and you have the evidence before you.



Fig. 1. Thibetan, Hindu, Egyptian, and Norwegian temples.

Fig. 2. An Egyptian hieroglyphic.

These buildings—in their dates and situations so remote from one another, in their details of ornamentation so different from each other—show, nevertheless, one common plan. Each of them consists, as you see, of two chief members—a lower and an upper. The lower member is a square pyramid; the upper member an over-hanging box. All the original or religious architectures of the world have been framed upon this plan. And I leave it for yourselves to judge if it be not the plan you would expect the ancient priesthoods to adopt if we be permitted to suppose that the first great fact of human history was some such grand catastrophe as that of Noah's flood. The lower member of the plan would represent the Ararat; the upper member would represent the ark that rested on its summit.

But subdivision is the universal primary mode of growth, as all oologists well know. Every germinal cell first elon-

gates and then parts in the middle to form two, which in turn elongate, separate, and form four. These four form eight, and so on through eternity. Thought, too, obeys this law of matter. The first mythology must be, in course of time, extended and bisected, like all other living things. The creation is an apothecary's counter; heresy is its golden spatula.

We must investigate the rise of some great schism in mythology which produced also a great first schism in architectural ideas, resulting in a two-fold historic development of the original plan.

While the single pyramidal pile, with the single shrine upon its apex, continued to be in China in Thibet and in India the type of the religious edifice, there arose in Egypt, and spread throughout the European world, a duplicated type of temple—two mountains side by side, two arks upon their tops. The earliest Egyptian monuments are single; those of the middle and later empires are double. Two vast propylæa tower side by side to form the portal of that immense group of courts and shrines which we call the temple of Karnak at Thebes.

In modern times the Christian cathedrals were built upon this plan, but with a difference. Instead of the twin towers being themselves capped with two arks, a single ark or nave was placed between them. Look at the huge square Roman towers at the west end of the Abbey of Jumièges near Rouen; at the great west-end Norman towers of William the Conqueror's abbey-church for men in Caen; at the Gothic towers of Notre Dame in Paris; at Wren's west towers of Westminster; at all the most celebrated cathedrals of western Europe, some of which have been completed during our own lives. It is the plan of Christendom.

What explanation now has history, or natural history, to offer of this singular departure from the original type of temple? Does it mark the origin and growth of that nice æsthetic function of the mind which we call symmetry? Is it related to the rise of those obscure but natural speculations of the old mythologists, which resulted in the spread of Phallic worship, and which duplicated all the gods of Egypt and Greece, and laid the foundation for the early speculations of philosophers respecting the male and female

elements of force in nature? or does it stand in evidence of the first attempts of the human intellect to oppose dualism to unity, and satisfy the human soul with a philosophy that shall explain the origin of evil without detracting from the goodness of omnipotence? At all events, I think I can convince you it was no mere accident.

Perhaps, if we could discover why the Hebrew story of the deluge, written in southern Syria, went to the borders of the Caspian Sea, to Armenia, to select a mountain for its scenery we might solve the riddle. The Armenian Ararat (see Fig. 3) is an extinct volcano, rising directly

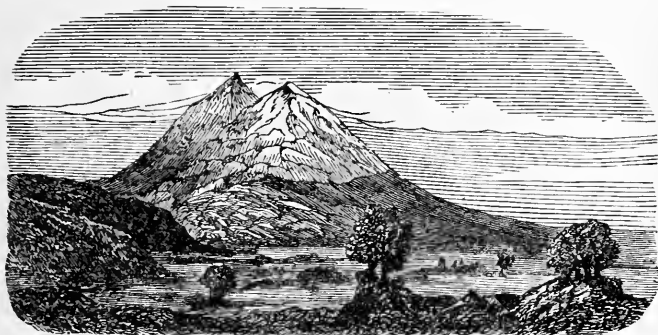


Fig. 3. Mount Ararat in Armenia.

from the surface of an immense plain to the distinguished height of 13,000 feet. The plain is itself 3000 feet above the sea; all the upper part of the mountain is therefore within the limits of perpetual snow. But it is not a single cone; it is grandly duplicated; and in the notch between the cones tradition says the ribs of the old ship still sleep; but woe to the mortal who attempts to reach its dreadful resting-place!

The cones are of unequal height, one being 13,300, the other only 9500 feet above the bed of the Araxes flowing through the plain. 'Nothing can be more beautiful than its shape,' writes Morier, 'or more awful than its height. All the surrounding mountains sink into insignificance when compared to it. It is perfect in all its parts; no hard rugged feature; no unnatural prominences; everything is in harmony, and all combine to render it one of the sublimest objects in nature.' And we may well add,

one of the most terrible. It is a sleeping lion. In the earthquake of 1840, which lasted from June until September, masses of rock and ice were thrown from the upper cones 6000 feet at a single bound, covering portions of the plains below with desolation.*

It seems to have been this splendid object that captivated the fancy of the human race as it moved westward along the historic belt of emigration. Mount Masius, the Damavend, Mount Meru, the Sufued Koh,† Adam's peak in Ceylon,‡ and all those other *typical diluvial* summits of central and eastern Asia were but single peaks, and satisfied the transcendental idea of a mountain. This double cone of Ararat (or the two Ararats, as they are called,) produced a ripple in the stream of tradition, divided it, and gave birth to the second grand order of duplicated architecture.§

There must have been among the early masons the same diversity of natural temperament as now exists among their representatives. One class would be idealists and claim that the true prototype and divine original was the mountain idea in its absolute unity. Another party, more sensuous and literal, and perhaps more artistic, would devote themselves to the expansion of that first idea, and to the imitation of the actual Ararat, producing all their forms in double series. Thus even the Druid barrow came to be elongated and furnished with a peak at either end; for it is scarcely disputed now that the long barrows are of a later age than the round mounds. Thus also, in Italy the pediment was split into two, and the urn was placed

* See Major Voskoboinikof's report in the *Athenæum* for 1841, p. 157; quoted in Kitto, *sub voc.*

† Or White Mountain, on the road to Peshawur and Cabul. Opposite it is Noorgill, or Kooner, a towering hill. Here the Affghans set the Ark. (Burne's Travels in Bokhara, i. p. 117.)

‡ The Samaritan Pentateuch gives in Gen. viii. 4, *Sarandib*, which is the Arabic name of Ceylon.

§ אֲרָרָט 'The mountains of Ararat.' It is nowhere a Bible name for a mountain. Gen. viii. 4. See only elsewhere 2 Kings xix. 37; Is. xxxvii. 38; and Jer. ii. 27. It must have been east of Mesopotamia; see Gen. xi. 2, and Kitto's fine argument. In the Sibylline verses the mountains of Ararat are in Πύργια; Απαμεια in Phrygia was called by Greeks κιβωτος, the Ark, because enclosed by three rivers in the shape of an ark.

between its peaks, instead of on the summit of the pediment. (See Fig. 4.)



Fig. 4. The Pediment, split to receive the Urn ; and the Hour-glass.

We are now prepared to speak of ' styles,' and to study architecture in detail.

Every race, almost every nation, developed the Arkite plan, whether single or double, in a separate style: a style of its own, or a composition of the styles of its neighbours and of preceding ages. Nothing human remains unchanged except fundamental ideas. The whole effort of nature is to put forth buds and branches on every side, so as to realize an idea to the utmost. Nature has no sympathy with our purist prejudices. She is no quaker. She never grows cold and stupid. She is never consistent; she is always ready to go back and begin again, as water when stopped by some obstruction finds new channels that suit it quite as well. Every style has had its own particular and peculiar beauties; and every style has begun in simplicity and grown composite; or become degraded, as we choose to say. Every original symbolical form has been taken up by the apprentices of the master-mason who invented it, and been elaborated and intensified and repeated and varied in all possible ways, and combined with other symbols, until its personal identity has become lost amid the crowd of similar forms; until its nature has been perverted and its meaning contradicted and its eminence exchanged for degradation, and its beauty bartered for some cheap utility.

As in eastern lands the slave becomes sultan, and the sons of princes have their eyes put out and become beggars in the streets, so in architectural styles the fisher's skiff has risen to be a cathedral, and the pyramid of Cheops sunk to become the chamfered point of a graveyard obelisk.

It was in obedience to this organic law of reduplication and variation that the primitive symbolism of

architecture developed itself. You remember the story of the Apostle Paul and the silversmiths of Ephesus, whose trade was to make shrines for the great goddess Diana. It is understood by antiquarian scholars that these shrines were small portable models of the Ephesian Temple, perhaps intended for private oratories, like those plaster shrines of the Virgin Mary which good Roman Catholics buy every day to place upon their dressing-tables or mantle-pieces. So in the earliest times the more celebrated monuments of architectural magnificence were thus reduced for private devotion.

The same desire to duplicate the symbol provoked the manufacture of ornaments in the shape of temples; ornaments not only for the person, but for the temples themselves. A modern instance of this application of art is to be seen in York minster, in the centre of which, and hung midway between the vaulted ceiling and the floor, or rather I should say supported in that position by an arch-like partition in the church called a rood loft, is seen the great organ, a model of the cathedral itself. Just so, in ancient times, the idea of a truncated pyramid supporting an ark-like cornice was thinned down to the idea of a square column supporting a box-shaped capital.

We must start all architecture from the Pyramid; as we must draw from Ararat, or some other sacred mountain, the source of all mythology. **BR-BR** was the old Egyptian or hieroglyphic name for a pyramid. All architecture was in its beginnings bar-bar-ous, that is, pyramidal. The term was afterwards extended in its meaning by the Greeks to include all other objects foreign to their refined tastes and their artistic religion. They called the Thracians, the Phrygians, the Syrians barbarians, although in many respects more advanced in civilization than themselves, not because these nations committed savage acts or erected less magnificent monuments than the Greeks themselves, but because these nations, in their religious architecture and in their superstitious rites, preserved a large measure of that Arkite or pyramidal mythology which took its name from the pyramid or **BAR-BAR** of old Egypt.*


* Πίρωμις (homo) δέ ἐστι κατ' Ἑλλάδα γλῶσσαν καλὸς κ' ἀγαθός. Herod. II. 143. Uhlmann, in his *De Veterum Egyptorum lingua et litteris*,

The same origin is to be assigned to the obelisk, the Egyptian name of which, however, was ΤΧΝ. Some have talked absurdly enough about its being a representation of the forthputting power of nature. Others have supposed it an invention of the fire-worshippers to represent a flame. But the first appearance of fire-worship in Egypt dates back no farther than the 17th dynasty, and soon became a detested heresy; while there are obelisks of the 12th dynasty.

The obelisk was merely a portable, or idealized, or adjunct pyramid. It stood isolated in front of the pyramidal propylon. When the propylon was duplicated the obelisk was duplicated also. All obelisks are terminated above in a genuine minute pyramid.

The same origin is to be assigned to the solitary column in other lands, or to the pairs of columns, like those which stand before the rock-temples of India. Solomon made two to stand before his sanctuary in Jerusalem, calling the one Boaz and the other Jachin. And the Jews were accustomed to plant two trees in every garden to represent these columns.

We reach next in order of development the arcade. The Egyptians had already used it for their inside galleries and temple-halls. The Greeks and Romans, obliged to roof their sacred edifices, placed it outside, underneath the gable end or pediment; increasing the number of columns from four to six and eight, and finally carrying whole ranges of them around the temple cella. The pediment

p. 31, suggests that Herodotus was led to this etymology by the Egyptian (or Coptic) expressions φρωος, pulcher, μη, justus esse. But I think it quite possible that Herodotus rather gave the Egyptian *sentiments* respecting the pyramid, as the oldest, most sacred, best, and most beautiful thing in the world. On page 27 Uhlmann thinks, from the fact that the Egyptian *pyramus* is in Arabic , that the *py* is no essential part of the word, but only the Coptic article; while *papa* is the Egyptian word for *height*, as it is in Hebrew (Kirch. Scala. M. 49). Compare Rossii Etym. Ægypt. 159. Kitto's Bibl. Dict. Other etymologies have been proposed, such as π-ουρο-βα, sepulchre of kings, but the subject is still in the dark. Comparative philologists, however, will agree with me that πυρ-μυδ is directly convertible into βαρ-βαρ, or vice versâ, and that in the absence of any universally accepted etymology for πυραμυς, the Egyptian synonyme given in the text above is perfectly good ground for a new theory to stand upon.

which they supported was but another pyramid elevated in the air. The words *pyramid* and *pediment* are the same in their alphabetic elements. It was in the tympanum of the pediment that the Greeks assembled the images of their Olympic deities.* The whole roof of the Grecian temple, although so different in outside form, was, in the general plan, identical with the upper or ark member of the structure. The Romans, not content with this, went one step farther and placed upon the peak of the pediment an **URN**.

I must stop for a moment to enforce the argument I am pursuing with a definition of this remarkable word. We think that it is merely the Latin *urna*, which has become the property of all the Romanic languages. But, in fact, the Latins received it from the East. It is nothing more or less than the Hebrew name for the *Ark of the Covenant* אֲרֹן (ARN). But we can go still farther back. It was the Egyptian name for the *cartouche*.

Now the *cartouche* is an oval enclosure containing the hieroglyphic letters which make a royal name. The Pharaoh in his sarcophagus or urn was symbolized by his name in its cartouche or **ARN**. The Romans merely applied the word to express a coffer of peculiar shape made to preserve the ashes of the dead. The modern urn is the lineal descendant of the symbolic sarcophagus of Osiris, and of the ark of Noah.

Look at its peculiar shape (Fig. 4). It consists of a combination of the same two members, the ark upon the mountain top, which I before described as constituting the essential parts of every piece of architecture. This urn the Romans placed upon the top of the temple pediment.

Architects have capped the temple with a *dome* to duplicate and make more eminent the representation of the mountain, and have placed on top of this a lily, a pine apple, a lantern or *cupola*, to represent again the ark. The Mohammedans have chosen the more appropriate ship symbol of the crescent.

The same compound symbol is seen inside the churches of Christians in three forms: first, in the *altar* (al-tor, the mountain) and upon it the communion cup; secondly,

* Compare the cap on the head of Perseus, ornamented with figures of the deities.

in the baptismal *font* upon its spreading sculptured base ; and thirdly, in the *pulpit*, with its ark-like box, from which the preacher prophesies, and with its quaintly-carved stem below. Its very name *pulpit* is convertibly identical with *pyramid* and *pediment*.

I leave a fruitful theme, capable of infinite and delightful illustration, as any one may see who enters one of the modern Catholic churches built under the supervision of the Jesuit priests, where, especially about the sanctuary, symbol is piled on symbol, each one the mere repetition of the other, until the eye is wearied with confusion and the taste disgusted with excess.

Let us go back again to earlier times when moderation and simplicity still kept the symbolic shape of ornaments sharply cut and easy to be recognized. Let us take for a good specimen to study, the Doric column.

The Doric Style, so called, was not invented by that small tribe of Grecian people called the Dorians. As I have already stated, it is found in Lower Egypt in architecture of great antiquity. It would almost be just to say that the Dorians were called after *it*. They were worshippers of the *TOR* ; and the Doric column became in their hands the purest, simplest, noblest and most beautiful of all the forms that the architectural idea has ever assumed. Look at it. Poets and painters have vied with each other in exhausting the vocabulary of admiring epithets to describe its severe simplicity, its exquisite symmetry, its graceful majesty, the charm of its lights and shadows, the serenity of its unconscious strength ; the delicacy of its capital, yielding to the pressure above, yet sustaining the crushing weight ; and the vertical contrast to the horizontal architrave of its fluted shaft, rising out of the expanded marble floor of *stilobate* like an island-mountain from the placid surface of the sea. For that is just what it was meant to represent. Therefore the Doric column has no base. And therefore, also, the Doric column is channeled like a mountain with valleys. The Doric channels are the ravines descending to the water ; their shape is quite different from that of the Ionic or Corinthian flutes.

Remember that we are dealing with a product of the fancy ! Remember, also, that the early fancy of mankind was a heated fancy, and had lost none of its fire in the time

of Pericles. It was a religious fancy, an unscientific fancy, an enthusiastic fancy, a fancy sticking at nothing by which it could reach its symbolistic ends. At all events, it was no modern, materialistic, cynical, critical, mechanical, steam-engine building, Wall-street or State-street jobbing fancy. All the history of art tells us that it was finer than our judgment of it.

I have already mentioned the literal exchange of L for R all over the world, and the fact that the Greeks and Phœnicians said TOR and ZUR where Arabs said TOL and TEL for *mountain*. So the Greeks named the shaft of their Toric column $\sigma\tau\upsilon\lambda\eta$ (s-TOL), from which we get our English word *style*, through the little column-like pencil with which the scribes wrote upon tablets of wax.* Is not this a curious illustration of our proposition that the men of letters in old times were the architects? But I will give you now a still more curious and significant coincidence.

The favourite Egyptian hieroglyphic form of the letter A was a *feather*, plume or quill.† It stood at the begin-



Fig. 5 A; IU; Goddess Ma; Truth; Crowns of Upper and Lower Egypt.

ning of all words the first sound in which was A. But a jackal holding a feather was the emblem of a *scribe*. On the head of a sitting goddess the upright feather meant historic *truth*. MA, the goddess of truth, had two feathers on her head; as the shrine had two obelisks before it on which were written its history. The double letter, AA, was originally, therefore, written with two feathers, which, however, in time came to stand, in the later alphabet, for the letter I, or rather the diphthong IU, as in the word Judæa. Observe the coincidence! The Coptic *word* AA means to *build*. And the old Egyptian name for an edifice is simply A, the *single letter* A. The scribe and the architect were one. The temple-wall and the chisel which cut those immortal hieroglyphics into its surface were one. The

* The S initial stands for SAN. *Sacred*.

† See Bunsen, p. 556 and 561, and Ideography, No. 174, 173. (Fig. 5, above.)

mountain, *tol*, became a carpenter's *tool*; the column dwindled to the engraver's *style*; but the soul that lived and spoke in all of them never changed; it was the same throughout the series.

We have been occupied with but one part of the Doric column, the shaft or *style*; let us now look at the other member of it, the *capital*. There are etymologies connected with this also. I have said more than once that the words *TOL* and *TOR* were the same: here is another proof of it. King James's version calls the capitals of Solomon's two columns *chapters*. You will find no etymology of *capital* in the books except in the form of a reference to the Latin *caput* a head, *capitalis* principal. But *capitalis* will not explain that other equally Arkite word the name of the Roman *capitol*, that *citadel* which contained its native gods, its treasures, its recorded laws and the heart's love of the great Republic. Every city of any note in the ancient world had a similar citadel, the home of its tutelary deities. And what was such a citadel called? An *ark*—of course: **ARX**. And the records which it secured—what were *they*?—**ARCHIVES**.

The *capitol* of a column, then, is the *CAP* of its *TOL*, or *style*; the ship upon the mountain-top. And it was precisely in the Doric order of architecture, the shaft of which represented the *mountain* idea with most precision, that we have a capital most simply and purely representative of the ship. When I thus identify *cap* with *ship*, it is only what is done every day in using words similarly allied, one of which retains and the other has lost the initial *s*: such as *cup* and *s-coop*; the farmer calls his cap-like bee-hive a *s-cap*; the sailor calls the master of his ship a *s-kipper*; and the little boat from shore a *s-kiff*.

The word *cup* signifies holding or containing; and in such modern words as *coop* the form of the vessel is not at all essential to the meaning. A *hencoop* is not at all cup-shaped, but yet acts the part of a receptacle. And even the Latin *cap-io*, I take or hold, suggests no form. But at the beginning the form *was* essential to the meaning. The Hebrew word for the *palm of the hand*, therefore, was *CAP* (כַּף), because it throws itself into the form of a cup to receive anything. Many names of sacred shrines like the Kaaba of Mecca, and the profane little Kaabahs

which our young ladies find so convenient, are traceable to the same root which gave the ship its name.

Going back beyond the Hebrew use of the word *cap* we get still clearer light upon its origin; for the arm stretched upward in prayer or oblation, with the palm of the hand turned upward, is one of the commonest sights upon the monumental walls of Egypt. Look at it for a moment (Fig. 6), and see how the Arkite imagination would seize upon this living symbol, this Doric column done in flesh and blood. The Hebrew word for *arm* was DRO or TOR (דָּרֹךְ).* The hand lifted in prayer was therefore a true *caph-tor*, or capital. There is one very remarkable ideograph on the Egyptian monuments which can be explained in no other way than by reference to these facts. It is Bunsen's No. 99 (Fig. 6), a man kneeling and holding up a basin, with the pronunciation *n'ham*, and the meaning *to save*. What has the holding up of a basin to do with salvation? Nothing, unless there be a reference to the great salvation of Arkite mythology.



Observe now how our English word *arm* fits into all this. In drawing your attention to it, I am not digressing; but on the contrary leading on directly to the main subject of this lecture, which I am impatient to enter upon in a more systematic manner; but all these preliminary details were necessary and will come of use. First, let me once more insist upon the identity or interchangeability of the liquids L and R. Secondly, you must accept Grimm's law as equally true, although I cannot stop to prove it *in extenso*, that the labial letters B, P, F, V, the vowel U, and the nasal M, are also interchangeable in a certain order in all languages and dialects yet studied. Do you not call Maria and Mary, Molly and Polly? Do you not call Martha, Matty and Patty? Margaret becomes Maggy and Peggy, &c. Keeping this law in mind you will see how the English word **ARM** corresponds with the word **ALP** a mountain, precisely as the Hebrew *dor* an arm, corresponded to the Phœnician *tor* and the Arabic *tel* a mountain. You can also see why the Mont Blanc of Greece was called **OLuMpos**; and why the mountain beast of Asia with the *houdah* on

* דָּרֹךְ the arm, the shoulder of an animal, force, strength, &c. קָלִי belongs to a different set of ideas, regarding the arm as a *weapon*, or a *tool*.

his back was called an **ELePhant**; and why the bull with the crescent horns received the Syriac name of **ALF**. The mountain was not named from the arm, the arm was named from the mountain, and then only when held up in adoration, with some votive offering in its hollow palm. The mountain, the alp, was the beginning of all things in sacred history. Hence all ancient things were named after it. Olympus was the Ararat of Europe and curiously enough replaces Ararat on the coat of arms of the Duke de



Fig. 6. Doric column; Caph; n'ham; tam; escutcheon of Nevers; Crown of the Pharaohs.

Nevers among the beautiful sculptures in front of the old chateau in the middle of that little quaint city (Fig. 6). The most ancient and venerable river in Greece was named **ALFaíos**. The aborigines of Europe were called **ELVes**. The Latin word for *formerly* or *in ancient times* was **OLiM**. The Hebrew word for eternity, or unknown infinite beginning, was **OLM**. Hence the first letter of the alphabet had to be **ALFa**, or as the Shemites called it, **ALF**. And its shape also had to be Alpine, like its name. The letter A is simply a pyramid or mountain with a line drawn across it. In the ancient bardic books of Ireland, that seat of the learning of old times in the Druidic west, whenever the word *mountain* occurred it was not written out in full, but in its place they merely wrote a letter A; that was sufficient.

The science of philology as it now stands is largely made up of the results of the investigations of learned men into such subjects as these:—What is the whole number of distinct sounds which can be uttered by the human organs of speech? What special number of these sounds have been selected out of the whole number for use by different races and tribes of men in different countries? What distinction of these sounds can we make into vowels, semi-vowels and consonants; and of the consonants into sonants and surds, aspirates and sibilants, labials, dentals, linguals, gutturals and nasals? What relation do some of these

sounds as spoken in one language bear to others of them as spoken in another language; in other words, what is the real nature of those processes of transmutation, permutation, inversion, and reduplication of sounds which are all the time going on from generation to generation, as the tribes of men meet and influence each other's speech? How can we understand the formation of dialects? What are the true derivations of words? and what is the range of those modifications which time keeps making in the meanings of single words? An immense range of investigation into which I could not pretend to enter.

I have been keeping exclusively in view one special inquiry: what was the origin of the alphabet? Why were certain figures cut upon the surface of stone walls to represent certain sounds which issued from the human mouth? On what principle was this done? Why, for instance, and taking the first letter as it comes, and in its archaic Greek or Doric form, why was the vowel sound A painted to the eye by two strokes like legs and a third stroke across them? What is there in the *sound* A to suggest such a *shape*? Is there any *natural* connection between the two things? If not, then is there any *artificial* connection between them; any *fanciful* connection? If so, what *governed the fancy* of the man who invented the letter A, to cause him to establish such a connection? Could it have been by any possibility an accident?

This question, which goes down to the very roots of the science, has kept many brains busily thinking in all ages; for the pure and direct tradition of how it was done has been lost this long time, and it must be rediscovered in very roundabout ways. Nature loves to hide the beginnings of things, and seems to kill off her early creations merely for the sake of giving palæontologists a chance to develop their own intellects by the study of the fossils. It was a great question in the first centuries of the Christian era when the Talmuds were written, and the Indian Puranas, as this pretty Oriental story may show you:—

When Jesus was a little boy, his mother Mary took him by the hand and seated him at the feet of the village school master among the other children of Nazareth. When his master looked upon him he loved him and stroked his curly hair and called him a good boy, and he should learn

his a-b-c's. So he began to show him *aleph*, the first letter of the alphabet. 'But why is it called *aleph*?' said the boy. 'Ask not vain questions,' replied his master kindly 'but proceed with the next letter *beth*.' 'Not so,' said Jesus; 'I must comprehend the first; for God maketh nothing in vain.' Then, taking all the letters in order, he expounded unto his master the significations of all their forms.*

The legend does not inform us what this divine communication amounted to. But there is an Armenian version of it which gives us some idea of what it was. 'Behold,' said Jesus, 'how this letter A is made: the three upright strokes signify the three persons of the Trinity; and the stroke which underlies them signifies that these same three are one.' To comprehend this part of the legend, however, we must notice the shape of the letter in Armenian (Fig. 13, p. 240). We must remember then that this legend dates not merely from Christian days, but from a time subsequent to the Athanasian and Arian controversy. It was an Athanasian accommodation of the old Arkite trinity to the new controversies of the 4th century of the Christian era. But it was no mere monkish or scholastic whim. It had the essence of the old truth in it. Different as it looks, this strange-looking Armenian A has a form which, when critically studied, is essentially identical with the Cadmean A, the posture of the form only being varied, as I shall show directly.

I must here say, that one of the most remarkable circumstances connected with the tradition of the alphabet is the apparent indifference which the sculptors and scribes who invented the letters exhibited as to whether a letter stood upright, or leaned to the right or to the left, or lay upon its side, or was turned topsy-turvy so as to stand upon its head. We are not to suppose any greater nicety in writing nor any greater difficulty in reading what was written five thousand years ago than now. No doubt many an ancient scribe learned to write as badly as Rufus Choate; or as that superintendant of the Michigan Central Railroad whose angry letter of remonstrance and warning about keeping his cows off the track was used by the

* Norton, Vol. iii. p. 270. Discussion of the Marcosian sect of Gnostics (W. 54, 2).

farmer to whom it was addressed as a free-ticket on the line for a year.

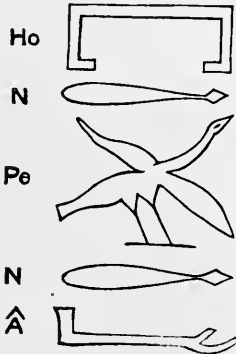
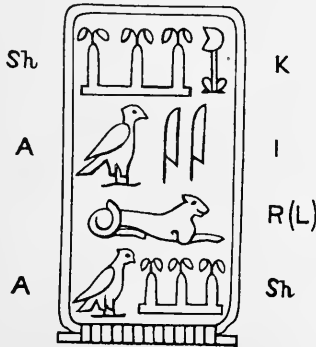
But there was a far better reason for this indifference than carelessness, or that familiarity which breeds contempt. If the earliest letters were pictorial symbols it did not much matter how they stood, provided the form which conveyed the idea was kept clearly before the eye. If any one out of several possible postures became a specialized and permanent variation, it was because that posture of the form could be also made as symbolical as the form itself. Such was the case of the *arm*. It was only when the arms were stretched upwards with the palms open, that they could typify adoration, praise, admiration, holy rejoicing and the like. You see it thus expressed in the 93rd ideograph of Bunsen's list (Fig. 7, p. 235). Its sound was *haa*; its meaning 'to rejoice;' and also the number 100,000,000. It was used like the Chinese exclamation of astonishment *Hai-ah!** To apply this symbol of veneration or astonishment to a special subject such as *time*, some addition had to be made to the symbol. A *feather* (which meant *history* and *truth* and *antiquity*) was placed upright upon the centre of its head, and then the symbol meant *one hundred million years*, or in other words an astonishing length of time.

But when the arm was not used to express this *a!* of *astonishment* or *veneration*, but merely the sound *a* as it issues in a simple and unimportant manner from the mouth, or as pronounced at the end of words and through the nose like the *on* and *m* final of the French, or like the nasal and final double *aa* of the Hebrew—then the arm was engraved in a horizontal position at the bottom of the word. We see it, for instance, thus in that bilingual inscription of 'the great Emperor Xerxes,' upon an alabaster vase in the cabinet of antiquities in the Royal Library at Paris (Fig. 8) which has played as important a part in the discovery of the lost key to the ancient Assyrian or Cunei-

* The 94th, 95th, and 96th ideographs are variations. The arms and neck alone, when used with the eagle (A) as a complement (Fig. 7), signifies the letter *κ*, or sound *KA*, as in *kam*, black; *skai*, to plough; *kaut*, to build; *ka*, a bull, goat, to receive; *mfka*, copper; *tka*, a spark, &c. Lamb thinks that it is the Hebrew \aleph turned upside down. See Bunsen's *Phonetics*, p. 562, vol. i., Egypt.

Figure 8.

Bilingual Inscription of Xerxes, on an Alabaster Vase,
in the Royal Library at Paris.



NOTE.—*Hou pe nâ* was Pauthier's reading. It is now read *Per aa pe aua*,
House great the greatest; i.e., the most Sublime Porte.



form writing as the more celebrated trilingual inscription commonly known as the Rosetta stone had previously played in Egyptology.* In the upper horizontal range of characters, the two letters \hat{A} and the two letters S were at once seen to correspond to the two letters A and the two letters Sh, in the hieroglyphic group in the cartouche below. In the art of reading a correspondence written in cypher, *c'est le premier pas qui coute*, a right beginning is all you want. Get one or two letters of the alphabet and the rest follow as obediently as a skein of thread when you have found the right end. But the hieroglyphic A here is represented by an eagle. The Egyptians had, in fact, three hieroglyphics to express this sound—the single feather, the arm, and the eagle. The *feather*, as I have said, standing for the initial long AA of astonishment; the *arm* standing for the final nasal ^aaa; and the *eagle* standing for a sort of gently aspirated ^ha, which there is no need to allude to farther.

Now what I wish to fix your attention upon is the shape of the Cuneiform or Assyrian letter A in this inscription. Remember what I have been saying about the apparent indifference of the ancient scribes to the position of the letters, provided the form was what they wished it to be. I do not here allude to the position of the letters in respect to one another in the word; although that too is a very important point to which not half enough attention has been given in the science of language. For words were written indifferently backwards and forwards; the old Greek inscriptions are written alternately backwards and forwards, from line to line, as a field is ploughed by farmers; and they actually called that mode of writing 'boustrophédon,' that is 'oxen turned.' And you see that in this cartouche the Egyptian scribe has done the same thing. The fact is, if *carving* the letters preceded the *writing of them with a pen*, as it probably did, the necessity for using a pushing or striking force coming from the right hand is apparent. Nothing can be more awkward than

* See the account of its discovery by St Martin, and its complete discussion, in G. Pauthier's '*Essai sur l'origine et la formation similaire des écritures figuratives chinoise et Egyptiens.*' Paris, 1842. Part I. p. 124, et seq. 'Kshhârshâ Neh Wuzurk—Kshairsha Hon Pe Nâ=Xerxes the Great.'—See note on page 235.

writing the Hebrew or Arabic letters ; but nothing is easier or more convenient than engraving them, commencing each letter from the bottom right-hand corner. The Chinese write from the top of the line downwards. On the contrary, the countyland-surveyor now-a-days writes his field-notes upwards, from the bottom of the page to the top. All this has caused many dialectic variations in the words of cognate languages which have greatly puzzled philologists ; e. g. the Hebrew *KOL* a voice, is in Greek *LOGOS* ; the Greek *gala* milk, is in Latin *LAC* ; and if I had time to go through the whole alphabet with you I would have to use this law of inversion to explain many things ; as e. g. how the Theb, or ark of Noah, came to be pronounced *Beth*, the second letter of the Shemitic alphabet, and *Bath*, meaning both a house or temple and a daughter, or the virgin goddess of the temple.

But my object in this course of lectures has been rather to state principles, to describe methods of thought, than to cram the imagination with detailed facts and subordinate results ; and I keep to the discussion of the letter *A*, not for the sake of any special pre-eminence that it may have, but as affording a good example of the method which governed the alphabet-making mind of antiquity.

You see, then, that the position of the form of the letter itself, that is, its *posture*, was so variable that it could be laid upon its side, and turned over upon its head, apparently without inconvenience. Mark me, I say *apparently*, not *really*. Those old wise men knew what they were about. Their fancy was as dogmatic as our logic, and loved etiquette and punctilio as well as our natural science does. If the old Assyrian scribes wrote the letter *A* thus  with three upright strokes and a fourth stroke laid across *on top* ; and the Armenian scribes, many centuries afterwards, saw fit to reverse their letter *A* thus , that is, three upright strokes and a fourth laid *underneath* —they certainly had some dogmatic reason for doing so. And the Marcasian legend of the little Jesus tells us what that was ; ‘to teach us,’ said the little master, ‘that the beginnings of all things is one essence in three persons.’ But why would not the stroke, when drawn *above* do as well as when drawn *below* ? The Egyptians expressed the emanations from the sun, *sunlight*, by three waved lines descending from a circle

surrounding a dot; and the ancient Chinese expressed spiritual emanations, *spirit*, *genius*, *genii*, by three strokes beneath a fourth horizontal stroke. And although this figure received another small horizontal stroke subsequently, its meaning remained the same, and has been considered so important that it forms the key to an entire class of Chinese words, viz. all those which relate to the spiritual intelligence of mankind, the power of expressing thoughts in words, the power of giving names to things. Its ancient and its modern form are both given in Fig. 9. p. 245. It is called *chi*, and means *monere*, *significare*, *præcipere*, *ostendere*, *respicere*, *docere*, *per scripturam significare*.*

But the Athanasian theology was not so easily satisfied; it had a certain technical expression to employ, viz. 'the *hypostatical* relation of three persons in one God.' If you look in Greek dictionaries for the word *hypostasis*, you will be rather astonished to see no theological allusion whatever in its meaning; for it stood to the Greek farmer for nothing but *wine lees*. It meant simply what our chemists would call a *precipitate*. But it was made up of two words, —*hupo* under, and *histemi* to stand; and its original meaning must have been *something fundamental* or *at the bottom*. Angry theologians got to hurling this word at each other's heads with this older meaning which perhaps it still retained in the learned world. The hypostatical union of the three Divine persons meant their fundamental union, their personalities rooted in a common underlying substance or substratum. The Scribes could do no less than the Pharisees. The letter which had come down to them from Assyrian days, bearing its Arkite signification of *eternity* and *divinity*, the beginnings of things and the stuff of the world's phenomena, suited their purpose exactly, provided they took the fourth stroke which joined the tops of the other three, and put it below, making it *hypostatical* or *fundamental*.

Going back now to the Cadmean or Alpine form of the letter A, will you demand that I bring it into similar relationship with the Armenian and Assyrian forms? The demand would be just if I asserted that the Cadmean idea

* French Dictionary, p. 489. Also see the 113th Key, Kij.

of the letter was precisely the same as the Assyrian or Armenian idea of it. But all alphabets were not made in the same age, nor by the same people, nor under the same set of influences. All I wish to hint this evening is, that, taken as a whole, and in the earlier ages of literature, a general Arkite mythology governed the fancy of men and therefore shaped all their attempts at expressing their religious and historical ideas both in architecture and in writing; and that the traces of this mythology exist under all modifications of the forms of letters in all alphabets even to the present time.

The origin of the curious *wedge form* of the Assyrian letters has not been explained. The scribes who wrote the archives of Nineveh and Babylon upon clay cylinders could have made their lines or strokes as straight and smooth as the Romans who wrote on wax made theirs. Letters made with such skill and care that they cannot be read sometimes without the help of a magnifying lens (a proof, by the way, that the lens was two or three thousand years older than the time of Galileo) show that the writers could do anything in the way of neat writing, and that they must have been inspired with some special reverence for letters made with strokes in the shape of a wedge, or rather *arrowhead*. Now Layard has figured among other things found in Assyria an altar on which reposes a gigantic arrowhead, half as large as the altar itself—as large in proportion in fact as a sheep or a calf would be if laid upon the altar. Lying thus upon the altar it must be considered as a sacred object offered to some God. Or, if the altar be merely a pedestal, then the arrowhead must be regarded as a divinity. But the arrowhead is just the shape of the Cadmean letter **A**; is Alpine in the Arkite sense; was used in divination; carried the great hyperborean Druid Abaris in Greek fable on its back to Delphi; and was as appropriate an offering as the fir-cone, or as the little pyramid held in the open palm of the Egyptian priest. What connection may hereafter be traced between this worship of the arrowhead in Mesopotamia and the use of flint weapons by the people of Central Asia in the Stone age I will not venture to conjecture. It is enough for my present purpose that the construction of the Assyrian letters out of arrowhead-shaped strokes

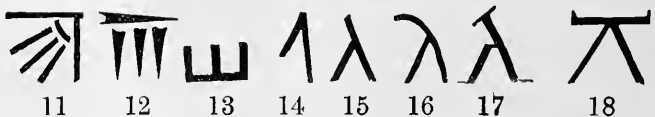
gave them a peculiar sanctity or significance in an Arkite sense, and converted them all into Alpine hieroglyphics.

Confining ourselves therefore still to this Alpine or pyramid symbol, let me ask you how an ancient scribe would be likely to make a letter out of it. Would it not be in one of these four ways? If he worked in a Chinese spirit, scorning perspective, he would use four diverging strokes to express its four sloping angles. If he were a true artist he would use three diverging strokes, the middle one perhaps a little on one side for the sake of perspective. If he were a literal fellow he would use two strokes and be satisfied with that. But if he were a transcendentalist he would use but one vertical stroke to represent the essential idea of isolated height.

Neglect the first form as too absurd for any body but a Chinaman, and the last also as too transcendental to have come into vogue until the refinements of later ages produced the obelisk out of the pyramid and the obeliskal letters out of the pyramidal, it remained for the common Alpine letter to be made of either two or three strokes, joined of course at the top. Look now at this series of ancient Cadmean letters, of which No. 1 is from a Greek boustrophedon inscription, the fourth is Phœnician, and the rest are antique Greek.



You will perceive how the original form came to vary so much that there is in some cases now scarcely a recognizable trace of its original intention. Look again at the initial Sanscrit A, No. 11 of the following forms; and

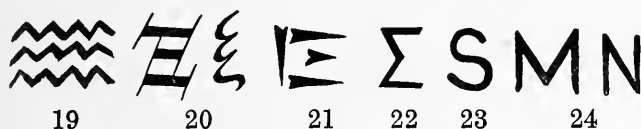


when you remember that all Sanscrit letters are hung upon a sort of clothes-line and boxed up by vertical strokes, you can see how the essential three divergent

lines of the pyramid may come to form the cuneiform letter, No 12; and, finally, the Armenian letter, No. 17.

But there are still simpler pyramidal forms for the letter. The Runic A has only two strokes, No. 14; and so had some of the Roman forms of the time of the Christian era, Nos. 15, 16, as well as the Mæso-Gothic, No. 18.

But there is an Irish form of great antiquity, used extensively in Europe, which has a peculiar significance, No. 18, formed of an horizontal stroke across the summit of two others. By reference to this upper stroke I think we reach a complete understanding of the Arkite ideas of the early alphabet-makers. But to make this clear I must speak of another element of alphabetic writing, the water-symbol.



The Egyptian hieroglyph for water was three horizontal waved lines, often reduced to one. In process of time this became merely a straight horizontal line. Out of this Egyptian hieroglyph the Greeks made their sharp hissing x (Ξ , ξ), and the Assyrians their cuneiform S, No. 21. The early Greeks made these lines waving like the Egyptian, but the classic Greek alphabet converted the waved into straight lines. The Greeks and Romans used the same Egyptian water-symbol for the simple sibilant s ; but they stood it up straight, No. 22; because water never hisses except when it rises in a jet or falls in a cataract. When they desired an alphabetic letter to express the *murmuring* sound of water as upon the sea shore they preserved the original horizontal posture of the symbol; and hence our **MMs** and **NNs**. The most ancient Egyptians did not recognize in their alphabet the *hissing* sound of water: it would be difficult to say why, unless it might have arisen from the scarcity of rain and mountain-torrents, cascades and jets in the valley of the Nile. It is a curious fact also that they employed their water-symbol for their letter N; whereas for M they chose the figure of an owl.

These two sounds of water are recognized more or less

distinctly in all human languages. For instance, in our own English we have two names for the great and little waters of the earth: the former we call the *Main*, as the Hebrews called it *Mim*. The latter we call *Seas*. In eastern mythology the name of the hundred-headed sea-serpent on which Vishnu sits is in Sanscrit *Shi-shi*. The name of the Syrian Noah was *Xisuthrus*.

The soft hissing sound of Z in Italy had the same water form. The dental sibilant of the Greeks, Θ, was originally represented by the Egyptian zig-zag waterline surrounded by a circle. It was reduced afterwards to a line, and finally to a point or dot. In Arkite symbolism this letter had a special function in signifying things surrounded by water. Thus holy Mount Athos received its name, AΘ, because the A represented a mountain, and Θ signified that it was surrounded by the sea.

Let us return once more carrying with us now this water-symbol to the discussion of the letters that were founded on the mountain idea. The diluvial mountain could be represented in three ways: either in the air, or partially submerged, or wholly submerged; in other words, the water-symbol line could be drawn across it at the bottom, in the middle, or at the top. The first would make the Greek letter delta, Δ, the simple mountain TOL or TOR—our letter D. The second made the Greek letter alpha, A. The third gives us the Irish and Gothic letter *a*, No. 18 above. The Runic alphabet of northern Europe adds additional confirmation to these facts, by giving a pyramidal form to its letter *t*, the equivalent of the Greek *α*, and by calling it by the same name Tyr.

Finally, to show the connection of the pyramid and obelisk in alphabetic forms, as in architecture, it is only needful to contrast the A and T (or D) in respect of this horizontal waterline, with all the other letters. These are



the only two letters, carrying the waterline, in the old cuneiform alphabet; just as they stand apart from all the others in the Cadmean alphabets of the west in carrying

it; as may be seen in the following series. The *dj*, No. 27, and *sh*, 28, are no exceptions, for they are evidently subsequent modifications of the older simple *d*, No. 26. Nor is it less a significant fact that the only other letter besides *a*, made with three vertical strokes, is the letter *th*, No. 31.

I could adduce still a number of other instances of the essential similarity between these two letters. But I have already far transgressed the extent to which I had intended to carry the illustration of the subject. As I said at the outset, it is impossible to do more than to give you some idea of its richness; and to suggest a method of investigation which will be likely to yield the best results.

Each letter of the alphabet might be taken up in its turn and its original mythological significance developed by comparison with other letters in the same alphabet and other forms in other alphabets. For instance, the liquids L and R were used to represent the flowing of water, sliding and slipping actions, continuance, and all that class of ideas. Mythological explanations come in everywhere. Rhea the goddess of the flood, from $\rho\epsilon\omega$ to flow, and geographical names like Rhine and Rhone are good illustrations. Invention, design, the regulated fancy of a learned caste appear at every step. The natures of the letter-sounds were critically studied and ingeniously applied, as in the Greek word $\alpha\epsilon\iota$, (always) constructed out of vowels in a definite order so as to express *continued existence*.

In a word, words were designedly built up by the old scribes, by placing the letter-symbols in all sorts of well-devised positions and relations to each other, until the Arkite fancy was exhausted and satiated with its work or play; and then fresh crops of Arkisms took root in these strange compositions, and new series of fables sprang from them again to delight the taste and feed the veneration instinct of other generations.

But before bidding adieu to this whole subject to pass to quite a different one in the next lecture I must say a word respecting the history of the growth of the more ancient alphabets.











The history which Chinese scholars give of the growth of their own language is precise and authentic,

although their literature will not compare for antiquity with that of Egypt. The most ancient book they have, is supposed to have been written somewhat more than 1000 years before Christ, that is, before the time of King David. It is called Y-King or *the book of transformations*. In a supplement to it called Hi-thseú, edited by two learned Chinese of the 11th century before the Christian era,* we find this account of the origin of Chinese writing: 'In old times Pâoi or Foï-hi governed the world; and lifting up his eyes, saw figures in the sky; and casting down his eyes, saw models of them on the earth, in the forms of birds and beasts, and in the proportions of the earth. From these near and distant objects he began to trace out the eight symbols (kouá), to penetrate the meaning of the divine intelligence, and to classify therein the properties of things by genera.'

An ancient commentator upon this book explains that the fundamental distinctions involved in this classification were those of the *fixed* and the *mobile*, the *resisting* and the *yielding*; which correspond very well to the western *mountain* and *water* symbols. He adds that the generic figures were those of lakes and mountains, wind, thunder, &c. He then goes on farther to explain that Fo formed his letters by six rules. By the 1st he imitated the objects themselves; by the 2nd he combined these imitations into groups; by the 3rd he inverted their meanings; by the 4th he invented determinative marks to express accidents, 'high and low' for instance; by the 5th he gave his letters metaphorical meanings; by the 6th he showed by letters the sounds of things. Pauthier names these six classes of letters: 1. The Figurative; 2. The Qualitative; 3. The Composite; 4. The Polar or Antithetic; 5. The very numerous class in which an image of the object is given and with it another character to express the sound of its name; 6. The Abstract or Figurative. He gives five or six characters as examples of each class, from which I select but one to show the plan upon which it was constructed and the change its shape has undergone in course of time.

* Wén-wáng and Tcheou-Koung; see Pauthier's Essay, page 3, et seq. The commentator takes occasion to remark that before Fo's time men employed knotted cords in the administration of affairs.

For example:—Fig. 9.

1st Class, Imitative.	} 	the sun : now written	
2nd Class, Qualitative.	} 	morning: " "	
3rd Class, Composite.	} 	(sun and moon) light: now written	
4th Class, Polar or Antithetic.	} 	left	} " 
	} 	right	
5th Class, very numerous, Image and Sound combined.	} 	spirit, genius from on high: "	
6th Class, Abstract, or Figurative.	} 	heart, i.e. soul: "	

In Fig. 9 above, No. 1 is the Sun, represented as on the Egyptian hieroglyphics, by a disc with a dot in it; 2. Morning, by a solar disc above a horizon line; 3. Light, by the two figures of the sun and moon combined; 4. Left and right, by skeleton human figures, without legs, bowing different ways; 5. Spirit, or genius sent from above, by three slightly wavy lines depending from a horizontal line, meaning the sky; 6. Soul or affection, by a heart. Many other and finer examples might with a little care be selected. The best description I have seen of the figurative cunning of the inventors of the ancient Chinese characters is in H. Noel Humphreys' History of Writing. Take, for instance, the three signs following:—

	folding doors;		listening;		asking a question.
		ear.		mouth.	

Or these :



The passage of the figurative into the phonetic is accomplished under class V. by a union of the two ; thus, a duck is not only drawn, Fig 10, but has a character added to express the sound of its name *ki*. A willow is represented by a tree and the phonetic *ki*. A root is represented by a tree, and a phonetic *ken*. &c.

Fig. 10.



Rude as this method is, it was the one adopted also by the inventors of the Egyptian hieroglyphics. In fact, these phonetic adjuncts are little else than the *matres lectionis* of the Hebrew, in the essential genius of their purpose.

There are some remarkable fables relating to this invention of the great Cadmus of the East, which throw a new light upon its nature. In one passage it is said that Fo got the external forms of things from the heavens, but his *letter-figures* he saw 'upon the picture which issued before him from the waters.' And this mystic Arkite description of the nature of the origin of letters does not by any means stand alone. It is repeated by other writers, and in other forms, and has no doubt some deep significance. Men whose books are filled with practical wisdom, humour and wit, shrewd sarcasm and a refined fancy do not utter what seems the sheerest nonsense, the folly of babes, without a cause.

Lopi, the author of the ancient 'book of itineraries,' writes, that Fohi called his new invention Dragon-writing, because he found it in marks upon the back of a Dragon-horse *which rose out of the waves*. For the same reason all the great mandarins or scribes in early days were denominated dragons. It will occur to you at once that Cadmus, whom the Greeks considered the inventor of the alphabet,

obtained his colonists by sowing the teeth of a dragon. The hydra, the many-headed dragon of Greek fable, as its name shows represented the raging waves of the sea. The Chinese word *Shan*, a mountain, is expressed by a character which shows three teeth. The centaurs of Greece—half man, half horse—were the learned men of that heroic age, 'the priests of the mountain,' כּוּדֵי צוּר; and their chief initiated Hercules and Achilles into all the mysteries of learning which then were.

Whatever may be the date assigned to the origin of the alphabet, or what the country, the fable still wears this peculiar mountain-water or Arkite garb. One Chinese authority, Hoâi-nan-tscù (189 B.C.) asserts that Thsan-hiè, crown lawyer to the Emperor Hoang-ti in 2698 B.C. was the inventor. Another fixes on a somewhat lower date, 2357 B.C. But here again the fable shows itself in a still more perfect form; for the tortoise has always been the living and walking symbol of the Tor, the Druid under his tumulus; and therefore the Indian mythology piles the earth upon the elephant and the elephant upon the tortoise. The great sea-tortoise especially, seen with his back above the waves, struck the ancient Arkite imagination with transcendent admiration. So the story goes that the Emperor Yao in the year 2357 B.C. began to trace letters in imitation of the characters which he noticed on the *back of the divine tortoise* which was brought to him by a barbarian family from the far south. This tortoise was three feet wide and a thousand years old; and on its back was written in Kho-teau characters *the whole history of the world from its beginning*. The land of the south may have been India, or Mesopotamia, or Egypt, for all that we know to the contrary. A similar, but long subsequent, arrival of learned strangers about 1110 B. C. (a date not very far from that of Solomon's commerce with Ophir, by the way) is mentioned in the Li-tai-ki-sse.*

After describing the dragon-scrip of the most ancient times, and the tortoise-shell alphabet of the 24th century before Christ, the Chinese historians go on to tell us that **during** the Han dynasty, i. e. from 2205 down to 1766 B.C., **the** people got used to writing a third but also extremely

* Pauthier, p. 10.

ancient kind of characters, such as are seen on bells, vases and tripods preserved in the present museums and palaces of the celestial kingdom.

When the Tchcou dynasty came in, before the time of Solomon, 1134 B.C., its founder introduced a new modification of the alphabet, called the *bird tracks*, Niaó. Soon afterwards, that is, under the Wén-Wäng dynasty, 1110 B.C., the *fish-gambol* characters, Nu, came into vogue, and every kind of polite learning got systematized. It was at this time that the sage Pao-chi invented the five rules of politeness, the six kinds of music, the five methods of archery and the five styles of horsemanship; and fixed for all succeeding times the six styles of writing as now recognized by all Chinese scholars.

In 221 B.C. Li-sse, at the emperor's command, invented the small *tchouan* writing; but it was rejected except for the royal signets; and then he invented the *ta* or great *tcheuen* writing, a most artificial and fantastical form of character wholly different from those that had been in use, viz. under the Tchcou dynasty, 880 B.C., which scarcely differed from the Kou-wen or ancient figurative forms in which the six Kings, &c. of Khoung-tseu and the great Commentary of Tso-kieov-meng were all written.

Then came the dissolution of the Empire and the rise of the great heptarchy of independent provinces which caused local modifications of the characters chiefly due to differences in artistic taste. One of these provinces, the easternmost, ruled over by a dynasty called Han, had wisdom enough to throw overboard the whole literature of the past and attempt to open for the national mind a new career.

Once, only this once, in the history of this strange nation there seemed a chance of the establishment of that tremendous power in letters which changed the face of the intellectual world in the far west; I mean a pure phonetic alphabet such as gave Greece its empire over thought and Rome its empire over society and Palestine its throne of grace and worship over Christendom. Even Egypt knew enough to adopt a demotic or current hand. The number of Chinese characters amounts to 80,000. The whole number of Egyptian characters in Champollion's Dictionary is but 749. Those which modern science is content to use,

even including all the mathematical, chemical and other signs, would not amount to many more than a hundred. What China would be now, had the invention of the bold and easy cursive hand-writing been adopted by the Han dynasty in A.D. 76 to 88 no one may say. But the purely phonetic 'bureau hand,' *t'sao* as it was called, would probably have set the soul of China free from the incubus of its strange, fossilized, monosyllabic, uncompromising characters, which weighs the future down for ever under the load of all the past. But the experiment did not succeed. The emperor, Híáo-hô-ti, in A.D. 89 while John was writing his great Gospel, annulled the new invention on the ground that it disturbed the public education, and ordered a return to the culture of the ancient hand; on which his head grammarian, Hiu-chin, immediately composed a treatise in 40 books, which sealed the fate of China to the end of time. The Chinese characters now in use have certainly not varied in shape since the year 618 of the Christian era.*

But to show how they have varied since the invention of letters by Fohi, I take from Pauthier the following



specimens of the three ancient styles, called: 1. the *Kouwen*, of the highest antiquity; 2. the *Tá-chouen*, of mean antiquity; 3. the *Siao-chouen*, of low antiquity; followed by, 4. the *Li-chou*, or bureau character; 5. the *Hing-chou*, common or current hand; 6. the *Thsao-chou*, cursive hand; 7. the *Kiui-chou*, square seal character; and, 8. the *Kivi-hing-chou* or current hand, all of more modern age. Fig. 12 gives the original *Kouwen* characters

* Pauthier, p. 21.

for 'heaven,' 'man,' and the 'savage beast ssé,' followed by the modifications of form to which they were subjected, corresponding to the other seven styles of writing successively coming into vogue during the four thousand years which have elapsed since the reputed age of Fo.

It is only by tracing the forms of the Chinese radicals back through their various transformations to their original that any comparison with the Egyptian hieroglyphs can be made; but when this is carefully done important analogies are discoverable. The classification of ideas common to both eras has been made upon a common principle, which was in fact to be expected from the very constitution of the human mind. But in some instances forms are also common to the two systems, establishing some actual historical connection between the two such as is hinted at by the legends cited above.



示 米 人 女 肉 牛 鳥 虫 魚 水 艸



貝 石 宀 金 辰 日 火 水(?) 聿 行

Figure 13 gives the twenty-two* characters which the priests of Egypt invented for determining the class to which any particular hieroglyphic belonged, when its pronounced or written name would not of itself show. The modern alphabetic writing has done away with the necessity for such a rude device, but originally some such

* Pauthier's Essai, p. 103. Uhlemann gives thirteen, on the authority of Ideler, based on Champollion. Bunsen's list is more extensive.

method was indispensable. For instance, the difference between *sheep* and *ship* in English is made in writing by using in one case two vowels *e*, and in the other one vowel *i*. But in the absence of vowels it would be necessary to add to the word *shp* some sign, in the one case a rude picture of a boat, and in the other case a rude sketch of an animal. This is precisely the mode in which the Egyptians used the following determinative signs, standing for—1. all names of gods; 2. of goddesses; 3. of men; 4. women; 5. members of the body; 6. quadrupeds; 7. birds; 8. reptiles; 9. fish; 10. trees; 11. plants; 12. metals; 13. stones; 14. edifices or habitations; 15. places; 16. stars; 17. divisions of time; 18. fire; 19. fluids; 20. things noxious or ecclesiastically impure or unclean, represented by a sparrow; 21. scripture; and 22. actions.

Under these I have arranged a selection from the whole list of over 200 Chinese radicals, such as represent the same ideas, by equivalent denominative signs. These are named in Chinese: 1. Kÿ (Radicals, 113, 119, p. 489 of the Great French Dictionary); 2. Mÿ, p. 534; 3. Jin, 9, p. 8; 4. Nù, 38, p. 138; 5. Jō, 130, p. 587; 6. Niéou, 93, p. 398; 7. Niào, 196, p. 899; 8. Tchong, 142, p. 655; 9. Yû, 195, p. 891; 10. Mō, 75, p. 288; 11. Tsao, 140, p. 615; 12. Peh, 154, p. 724; 13. Chÿ, 112, p. 478; 14. Miên, 40, p. 145, and Yèn, 53, p. 177; 15. Kîn, 167, p. 793, Y, 163, p. 779, and Feòu, 170, p. 818; 16. Chin, 161, p. 765; 17. Jÿ, 72, p. 274; 18. Hò, 86, p. 320; 19. Chòu, 85, p. 343; 20, 21. Yü, 129, p. 586; 22. Hing, 144, p. 672.

The principal alphabets to be studied are the Punic; the still but partially understood Italic or Etruscan group; the Phœnician, Samaritan, Himyaritic, Arabic, Hebrew, Coptic and Amharic; the Armenian; the three extremely ancient cuneiform alphabets; the Davanagari and other alphabets in India; the Thibetan; the Burmese, Siamese and Singalese of farther India; the Japanese and the Corean. They are all different at first sight from one another, and some are comparatively modern. But when critically studied they are all found to be allied more or less distantly. Of all these the Corean is the most perfectly regular.

Our own alphabet, derived from the ancient Cadmean,

is theoretically reducible to four or five letters, representing that many classes of sounds :

Vowels	Labials.	Gutturals.	Dentals, &c.
A	B	C	D
E	F	G	H
I		K	L
	M		N
O	P	Q	RST
U	VW	X	
Y			Z

A mere glance at this scheme will show that the letters of the alphabet were not placed fortuitously in their position ; that the vowels came in the order of their vocal development ; in a word, that the entire alphabet is a fivefold orderly repetition of the first four letters, ABCD which in themselves sum up the entire range of sounds, and make the key notes to all the dialectic transmutations of letters to which I have already drawn attention more than once before. These transmutations occur regularly only within the respective columns of this scheme. For instance, B is exchanged for F, M, P, or V, but never for C, G, K, Q, or X ; nor for D, H, N, R, S, T, or Z. In cases where a letter of one column seems to be transmuted into a letter of another column, as in the often-quoted instances of William for Gulielmus,—German *welch* for old English *quilk*,—French *garenne* for English *warren*, &c., a loss of some letter must always be supposed, or the substitution of one of the vowels for one of the letters. In the three instances just quoted the initial *g* is lost:—thus *g-william* for *g-uhelm*, *q-welch* for *q-uilk*, *g-warren* for *g-(b)arenne*.

It is true that in the fourth column are collected dentals, linguals, sibilants, a nasal and an aspirate, but all these are proved to be transmutable by the simple method of comparing a dozen or two of allied dialects. D and T are in fact the same letter ; L and R are universally interchangeable ; S and Z are identical ; N is the nasal of D, as M is of B ; and H is in fact a sibilant in its simplest form, as such words as *άλς* and *sel* show.

Here I must leave this fascinating subject, hardly having taken the first step across its threshold, but only thrown open the door to exhibit the immensity and magnificence of its interior.

LECTURE X.

THE FOUR TYPES OF RELIGIOUS WORSHIP.

If the views be correct which I have very imperfectly expressed in the previous lectures of this course, we are now prepared to enter upon the last and most important and most interesting subject connected with the early history of man—the origin of its mythologies.

It will be necessary to keep always in view the fundamental distinction between religion and worship. Religion is the soul of worship. Worship is the body, the phenomenal form of religion. The religious life of man consists of a combination of three of his elemental forces,—Admiration, Love, and Fear—having for their object of activity the invisible or superhuman world.

As there are four great types of organic animal life, represented by the Articulate, Radiate, Mollusc, and Vertebrate kingdoms,—so there are four great types of this religious life, embodied in the Worship of the dead, the Worship of the powers of nature, the Worship of God in heaven, and the Worship of the universe.

Under these four heads all human conceptions of the divine as worshipful can be collected. In one sense they are four successive stages in the order of the development of the human intelligence governing the exercise of the instinct of worship. They are not only philosophically consecutive in the order of nature, but to a certain extent also historically consecutive in the order of time. They have co-existed in some ages, and been combined and intermixed in some countries, just as in the case of the four types of animal life. But they have virtually followed each other in ruling the world, just as in the succession

of geological ages Radiates had their *maximum* development first, Molluscs next, and Vertebrates last of all.

For it will not do to affirm—drawing sharp lines of distinction—that in the ages of man's first appearance on the planet there was no other worship than that of their dead parents, or of the manes of their heroes; that everywhere there followed Fetichism or the worship of the powers of nature; that then in later times all nations attained to the higher worship of some Fate, or Jove, or God of Heaven; and that finally, in these last times, a genuine Pantheism has grown universal. Far from it. Complex enough have been the combinations of religious ideas as far back in history as we can see. Varieties of the individual, co-working with varieties of race and with the various stages and kinds of civilization, have kept not only alive but in full vigour the worships of the past side by side with one another, and with the higher worships of the present day, developing in fact their four great types in four parallel lines, just as in the growth of the whole animal kingdom we notice that Radiates and Articulates lived together in the oldest sedimentary rocks, and are represented still in the multiform fauna of to-day; while Molluscs and Vertebrates, from the time when these appeared, have been mixed in with them through all the higher and later sediments.

All that we can affirm therefore is this;—that the earliest times of mankind seemed to be stamped with the forms of ancestral worship chiefly, some of which have lasted to the present moment;—fetichism of all kinds—stone worships, mountain worships, water worships, fire, air and sky worships, Sabæism, Mithraism, Indraism and the astrological systems of the ancients flourished chiefly in a second age, but have also lasted to our day;—then the cultivation of the *Taste* by idolatry and of the *Sentiments* by mysticism produced at the beginnings of historic times grand, dominating, ceremonial worships of a god supreme, Jove and Jehovahism, culminating in Christianity; and that, finally, the culture of the *Intellect* has developed Pantheism.

When circumstances favour their growth all these types are developed in a single nation, in a single individual; but they come to consciousness in this one order only.

Their consecutive development has been realized in all the cultivated portions of the great historic section of the race. Pantheism has expressed itself in the Hindu Vedas and in the Christian writings; by Plotinus the Pagan and by Spinoza the Christian; by Swedenborg in one characteristic form and by Hegel in another. On the one hand, children and savages cannot be Pantheists. On the other hand, philosophers like Ralph Waldo Emerson and Blanco White, historians like Buckle, naturalists like Von Baer were equally impossible in the Stone period. There is a time for everything under the sun. Ages may overlap. One nation may outstrip another in its religious development. One race may hurry forward from Fetichism to Pantheism with greater intellectual vivacity than another; but he who aspires to be the historian of mythologies must learn to recognize or have the genius to construct out of the apparent confusion which has thence ensued some wide, consistent, ever-working law of growth, some comprehensive system of religious development residing in the very nature of the common mind of man.

If now there be four types of religion, there are also but four modes of worship. I use the word here in a more precise and restricted sense. The religious sentiments of man, intelligently directing themselves towards any one of the four great objects of adoration, embody themselves in four forms of worship. In other words, all the religions of the ages have become incarnate with four members: Prayer, Praise, Offering, and Sacrifice. They correspond to the instincts of religious Fear, religious Love, religious Policy, and religious Conscience or the sense of justice. And they have filled the world for ages upon ages with cries, and songs, and gifts, and altar-smoke.

As worship is a body for the spirit of religion, so ceremonial is the dress which these four kinds of worship wear. Ceremonials are merely special shapes and combinations of prayer, praise, offering, and sacrifice, devised by the clerical imagination, localized by circumstances, and sanctified by long tradition.

In common parlance we speak of ceremonials as religions; and we class men rudely by them. There could not be a more unphilosophical mistake. An ethnologist might as well attempt to classify the races of mankind by the

fashions of their clothes. No two kinds of ceremonial, for example, could be more unlike than that of the Romish Church on the one side, and that of the Quakers, Puritans, Methodists, or Moravians on the other. And yet if we analyze the Papist and the Protestant with equal scrupulosity and skill, we shall obtain what chemists call 'allotropic elements' in both. What is Protestantism but melted sulphur dropped into cold water? or, if the *amour propre* of my audience demand another simile, red phosphorus, innocuous to the manufacturers? In the Romish communion you have Calvinist and Arminian, Jansenist and Jesuit, Rationalist and Mystic, just the same and just as eager as in the Protestant communions. There is not a spiritual distinction with which intercourse and literature have made us familiar that we cannot discover (of course, with intellectual modifications of expression, due to various culture) in all the religions of the modern world.

Nor is the rule confined to them. The same is true of the ancient mythologies. Under a ceremonial Joseph's coat of many colours they present a grand simplicity of essential symbolism. But the fourfold distinction of religious type remains; and combinations of the four modes of worship in each type are there. The mythologist must not allow himself to be cheated by the variety of ceremonial details. The confusion of priesthoods, and mysteries, and creeds, and fables, is only in appearance and in words, not in reality—only in the visible organizations and local establishments of the worshippers, not at all in the fundamental ideas that inspired and regulated their worships. Let us look at these—

I. The worship of the dead.

I have said so much on this subject in previous lectures, that nothing remains but to place it in its true relationship of precedency to the other forms of religious thought and conduct.

If it were necessary to add anything to the testimony which the Egyptian tombs of the first six dynasties afford to the extreme antiquity of ancestral worship among the more civilized nations at the dawn of history, we would find such additions in the mention of it in the hymns of the Rig Veda, the oldest literature of southern Asia. The laws of Menu speak of it as the most ancient religion of

mankind. Long after Brahmanism had substituted for the idea of immortality the doctrine of Metempsychosis, the custom of the *sraddha* or funereal repast continued to be kept; rice, milk, roots, fruit, were furnished regularly to the departed soul. The Greeks and Romans, and in fact all branches of the Aryan race, sacrificed periodically at the tomb.

So universal were these rites that De Coulanges thinks himself justified in basing upon them his theory of the Family Law of the ancients. The stranger was excluded. The dead accepted service and homage only from his children and descendants in direct succession. 'The dead,' says Lucian, 'who has left no son receives no offerings, and is exposed to a perpetual famine.' So long as the family supplied their head with what he needed in the other world, so long he was its god and benefactor. The living needed the dead, the dead the living, equally. This mutual tie produced the solidarity of the family, the clan, the tribe.

But from this service women were excluded. The hearth became an altar; the son became a priest. The daughter was always a servant—first to her father, then to her brother, then to her husband; once married, she passed into another family; marriage was a second birth—the wife was the daughter of her husband. If the dead had only daughters he lost his immortality, became a larva, or returned to earth in another body to obtain another family. 'The extinction of a family says the Baghavatgita 'causes the ruin of the religion of that family.' 'No man' says a Greek writer 'knowing that he must die can care so little for himself as to be willing to leave his family without descendants, for then no one can worship him.' 'If a man die without sons' says the Mosaic law 'let his brother marry his widow and procure him children.' 'By children' says the law of Menu 'a man acquits his debt towards his ancestors and secures his own immortality.' The Hindu who had no son married off his daughter on the condition, that her first son should be considered as his own.

This was the origin of the custom of *adoption* at a later period. The hereditary rights of property were first established entirely in the interest of this overwhelming re-

ligious consideration ; property could protect the hearth, the tomb, the funeral rites, the immortality. ' Religion prescribes ' says Cicero ' that the possessions and the worship of each family should be inseparable, and that the care of the sacrifices should always devolve upon him to whom the inheritance belongs.' The right of primogeniture in England is maintained by precisely analogous considerations. The Roman daughter could inherit nothing from her father. The Greek laws forbade the daughter to inherit anything. The common law derived from Rome considers the daughter always as a minor.

The adoption of a son, also, by another man than his father removed him entirely from his own family and passed him irrecoverably over to another, as in the case of a married daughter. When the demagogue Claudius carried favour with the populace by causing himself to be adopted by a plebeian Cicero thundered at him the tremendous rebuke ' Why dost thou expose, by thine own fault, the religion of the Claudian clan (*gens*) to become extinct !' Athens was but a confederation of families ; a number of families formed a *φρατρία*, a number of *phratræ* a tribe, and the tribes combined composed the city. The religion of the family retained its integrity long after the religion of the city was formulated in a more splendid shape. The fathers of the families became the *dii Gentiles* ; the city had its eponym deities.

So much for the classic literature of the subject. Let us turn back now to far more ancient days, beyond the dawn of written history. Let us study ancestor worship in its first beginnings, preceding all those notions of religious sentiment and worship with which the monuments of the great past have made us so familiar.

That it did actually precede all other kinds of religion seems indubitably settled by the archæological discoveries of the last few years. If the picture of the head of an elephant slightly engraved upon a blade of ivory, broken into five pieces, discovered by Dr Falconer in company with MM. Lartet and de Verneuil when they visited together the excavations making at the station of La Madeleine, Commune of Turzac, in the valley of the Vezère at the foot of the chalk cliffs of Perigord in 1864 proves that the aborigines of that part of France were acquainted

with the animal in its living state, although no elephants now live in Europe;—if the bunch of lines descending beneath the throat be sufficient evidence that this elephant which lived among them was no other than the long-haired Mammoth, now entirely extinct, the carcasses of which however are still preserved in the eternal ice banks of the Siberian coast enveloped in the shaggy mantles characteristic of the species; *—if another engraving of the head of a true elephant (that is, with almost vertical cranium) done upon a fragment of reindeer bone, found by M. de Vibraye at Laugierie-Basse, a station lower down the valley, proves in like manner that the elephant as well as the Mammoth lived in France at that remote epoch, specifically differing by its narrow oblong ears set forward close to the eye † from both the elephant of Africa and the elephant of Asia as we know them now;—if the picture of a combat of reindeers (in which the attitude of the conqueror is described as of surprising truth) upon a plate of shist, with representations of a stag and doe, a horse, an ox, an otter, and a beaver, upon other materials, all found together by M. de Vibraye in the diggings at Dordogne and Charente, ‡ give us all the proof we should require

* This peculiarity was verified by Mr Adams, in 1799, at the mouth of the River Lina. Troyon, p. 74. Comptes rendus de l'Academie des Sciences, lxi. p. 311.

† Comptes rendus l'Acad. des Sciences, lxi, 21 Aout, 1865. The eye itself is represented closed by a finely-cut oblique line in its normal position. The tusks are represented, and the trunk, rather thin, has a length about one and a half that of the head. Were these figures made under the influence of a traditional knowledge of the existence of the animals in a distant part of the world, chimerical characteristics would be apparent, whereas a scrupulous exactness of details has been observed, only to be accounted for on the supposition that the model was before the artist's eyes. And, of course, all doubt is set aside by the fact of the existence of the bones of these animals found in great numbers. Troyon, p. 75.

‡ Mortillet, *Materiaux*, 1^{ere} Année, p. 109. Troyon *l'homme fossile*, p. 73. I have myself examined a large number of these relics (in cast) in the cabinet of my friend Professor Desor, and can vouch for the sober truthfulness of the following description of them by Dr Broca;—‘One can hardly conceive of men, deprived of the use of metal, able to fabricate in bone, in ivory, in horn, an infinite variety of tools, extremely delicate: to chisel them into elegant forms, and represent by designs graven on the handles of their instruments, figures of various animals; figures which are distinguished by an exactitude and artistic ability truly remarkable. To find, in equal measure, the art sentiment we must

Fig. 14. Handle of a Dagger, made of reindeer horn, and representing a Falling Deer, found at Langerie Basse, Dordogne, France, 1863.



apart from the evidence afforded by the bones of the animals themselves fossilized in the same localities) that they were the contemporaries, the prey, and no doubt the dread of the men who sketched their forms;—if, in a word, such relics of rude skill serve well instead of books to inform us under what conditions the early races of mankind protracted their *material* existence, why should we not expect to get equally significant hints respecting their intellectual and spiritual state?

The question is answered for us by the *funerary grotto of Aurignac* in the south of France.

A workman making a terrace for a vineyard, in 1852, dug into a talus of loose earth piled against the foot of a limestone bluff, and exposed to day a large stone slab set upright against a small arched opening penetrating but a short distance into the rock. Seventeen human skeletons, some mammalian teeth, and eighteen little discs of sea-shell pierced as if for wearing round the neck, were superposed upon each other in the little cave. The mayor of the canton was a good Christian but a bad ethnologist; and so he gave orders to have the skeletons buried decently, before any one had a chance to examine them anatomically. Philanthropic, but rather stupid that; considering that these were the immortal relics of the Adams and Eves of Languedoc: and it was a chance, perhaps never to turn up again, for seeing if the story of an Eden could be proved or no. The adventure created no great excitement, and even the new burying-place of these antediluvian remains was afterwards forgotten.

descend innumerable centuries to the best days of Greece. They form a contrast with the gross tracery of Celtic monuments so absolute that, perhaps,—it has been suggested—they have been the handiwork of modern refugees in the caves of the old troglodytes. But who in Europe, since Quaternary times, could design on reindeer bone or horn, the figure of an elephant different from all the kinds now living? This interesting race led a peaceable existence. A cranium found in the grotto of Bruniquel is distinguished by purity of form, softness of contours, slight projection of its apophyses, and shallowness of muscular impressions,—features incompatible with the violent manners of a savage race.' In order to assure the reader that there can be no exaggeration in the eulogies bestowed upon these wonderful works of art, I have drawn the figure of a falling reindeer, which serves for the handle of a horn dagger, and he may judge for himself of the artistic genius which these inhabitants of Gaul, of the reindeer age, displayed. See fig. 14.

In 1860 M. Lartet, unable to recover the bodies, commenced his researches of the cave itself. After the stuff from the cliffs which had concealed the mouth of the cave had been removed, there remained a terrace standing about forty feet above the bed of the valley and level with the floor of the grotto. The soil of this terrace and the earthy floor of the grotto formed one continuous deposit, of variable thickness, but everywhere yielding relics of an ancient age,—hearthstones, charred wood and beds of cinders, pottery, flint tools and arrow-heads, and burned and fractured bones of animals. But mark this difference! All the traces of *fire*, all the marks of good-table fellowship, all the proofs of industry, were *outside*, not inside the grotto—in the soil of the terrace, not in the floor-earth of the cave. On the other hand, the human skeletons, the disjointed necklaces, were found *within* the grotto, and nothing of that sort occurred outside of it.

No stalactites were visible in this cave, nor the usual stalagmite covering to the floor; no traces of the usual bone-mud brought by water and enveloping the remains as in other ossuary caverns. The earthy deposit seemed a bed spread by the hands of man, on which to lay the bodies found upon it. It was, to all intents and purposes, a cave of Machpelah, an aboriginal mausoleum.

Outside the cave the friends of the departed had held their funereal feasts; but what were their delicacies? Animals no longer in existence,—the great cave-bear, the mammoth, the rhinoceros, the great horned Irish elk, and the cave-lion, attesting the immense antiquity of the event. The aurochs—now almost extinct—and the reindeer were also there. To these were added *entremets* of smaller creatures which have escaped extinction and continue to haunt our modern woods and fields: the common bear, the badger, polecat, wild-cat, wolf and fox, the horse and ass (?), the wild boar, common stag and roe buck.* All the bones which contained marrow were found broken or split lengthwise with a knife. Hyenas' bones were also found; and these foul creatures must have stolen in by night to gnaw the relics of the feast, for the transverse marks left by their teeth occurred on many of the surfaces, and their dung was on the spot.

* One bone of a hare was also found.

Inside the cave were also found portions of animal skeletons so articulated that it was evident the flesh had been upon them when they were deposited. Outside, the remains of ruminants predominated, especially of reindeer and of aurochs. Inside, those of carnivorous beasts predominated, especially the fox. Some species were only represented by their teeth.

A few more details, and we will be prepared to draw conclusions.

A hundred lamellæ of flint, some flakes or chips of flint, a kind of hammer, and some *nuclei* or matrix-blocks, gave positive indications that the manufacture of tools and weapons was carried on upon the spot; and, therefore that the visit of man to the grotto was not a single and incidental event. The bones and horns of the reindeer had been utilized for divers instruments, such as awls or bodkins, plain (unbarbed) arrow-heads, and whetstones in the shape of polished blades.

The earthy deposit inside the grotto contained with the human skeletons teeth of the cave-lion and wild boar, and bones of the cave-bear, wolf, fox, horse, aurochs, reindeer, and other mammals, neither broken, gnawed, nor burned.

The picture of a bird's head was sculptured on the eye-tooth of a bear. A lamella of flint perfectly fresh and unused lay near it. The earth that had been thrown out of the grotto in a heap upon the terrace at the time when the bodies were discovered was carefully searched, and furnished a beautiful specimen of worked reindeer-horn, and about a hundred worked flints; many of them however so exceedingly minute that it seems impossible to imagine them of any practical utility to those who made them and placed them with the dead. These were probably *miniature weapons*, such as those small bronze swords and spears, an inch or two in length, which are often found in the cinerary urns of the north and south of Europe.

In the same heap of dirt coming from the grotto were found, naturally enough, other human bones and bones of animals, none of which were either gnawed or broken; and several fragments of pottery more or less rudely made with the hand; the only instance on record yet in which this art has shown itself to be of an antiquity

commensurate with that of the extinct cave-bear. In all other cases where remains of pottery have been discovered, it has been in ossuary cave-deposits of the latest Stone age, i. e. (see page 66) contemporary with the *Bos primigenius* (Urus), long after the total extinction of the great cave-bear and large pachyderms, and the retirement of the reindeer to the polar regions. We must keep in mind however here that these other ossuary deposits were not composed, as in this case, of dry earth shovelled by man's hand; but muddy loams distributed by water; and that in such aqueous deposits *unburned* clay potsherds could have stood but little chance of preservation.

What now are our conclusions? We have here before us a terrace and a cave, divided by a door of stone. On the terrace traces of active life, a workshop and a table, so to speak. In the cave no trace of life, dead bodies only, carefully shut in from the assaults of weather and wild beasts. The dead were buried then, not burned. But more,—arms, ornaments, food, vessels, holding perfumes perhaps or fruits or cakes, were buried then (as in so many parts of the world is still the custom to this day) together with the dead.

Those savages believed in immortality! What was the age they lived in? The most remote of which we have as yet any certain information of the existence of mankind—unless the reported discoveries of human fossils in the tertiary rocks be true—the first of the four established epochs of the great Stone age, the epoch of the cave-bear, the antique elephant and first rhinoceros; for the bones of this gigantic kind of bear were found not only upon the terrace but inside the cave.

These funereal fires, these offerings in the tomb, this workshop of the travelling equipages of their dead before its door, are so many speaking traditions of an ancient, a most ancient, a first and altogether aboriginal *worship of the manes of the dead*.

The strangest part of this strange story is, that when we turn to look at other funerary grottoes, for there are others, caves formed by nature and used for tombs by man, we see, first, that they are of a much later age, viz. the fourth epoch of the age of Stone, that characterized by the

predominance of the urus bones and domesticated animals ; and secondly, we notice in them no traces of funereal repasts ; at least none such have been reported or described.*

Was the worship of the dead abandoned, or forgotten, or exchanged for some newer form of religious ceremony during this interval ? That is hardly a possible supposition ; for, as I have shown in previous lectures, Egyptian history opens under the auspices of this religious veneration for the dead ; and the Druid dolmens, cromlechs and other structures, now considered as belonging to the lacustrine or fourth epoch of the age of Stone, are all of them closely related to views and ceremonies which have the same religion for a starting-point. The cave of Aurignac stands as a fact so much alone in our present knowledge of those distant ages that it would be extremely hazardous to build any theory upon it involving comparative questions. It is very curious however to observe how the early sculpture also seems to have disappeared ; for on the Druid monuments, and even on the bronze utensils and armour of more civilized times—those of the lacustrine epoch—we find no pictures of animated nature ; only circular and cross-bar patterns of a mathematical character, or fanciful arabesque designs. If Troyon be correct in ascribing this remarkable abstention to religious prejudices, such as those which Moses afterwards established among the Jews, and Mahomet among his followers,—then he may be equally correct in assigning to the deluge a date falling between the third and fourth epochs of the age of Stone : that is, following the disappearance of the reindeer and previous to the appearance of the present races of domesticated animals and plants on European soil,—to a deluge which was connected with slow changes of sea-level, and the melting of continental glaciers ; to a deluge which destroyed, not all indeed, but a large part of the previous population, and allowed of a fresh importation from the Orient bringing with them an advance in arts and arms, domesticated animals, the serial grains and

* Since this was written, Mr Dumont has found a somewhat similar instance in Belgium.

orchard trees; and together with this new social life, a more complicated set of religious ideas, among which the pure and simple earlier worship of the dead would occupy a subordinate and perhaps an insignificant position.

But it is in vain for us to attempt in this advanced age either a defence or a precise definition of the extravagant story of the deluge transmitted to us by the Hebrew scriptures. M. Troyon's strong religious convictions have prevented him from saying in so many words that the deluge which he proposes to place between the third and fourth Stone age was an almost insensible variation of the sea-level, due to the retreat of the glacial fields; but he leaves that inference to be drawn by his readers. Such, however, would be no Noachian deluge. It would be quite another thing to ascribe the introduction of new ideas simply to an amelioration of the post-glacial climates and soils of Europe, permitting an influx of an advancing population among whom the primitive simplicity of ancestral worship had become confused and concealed by all those intellectual speculations and social customs which Professor Fustel de Coulanges, of Strasbourg, has traced backward in the pages of his admirable book, '*La Cité Antique*.'*

Whether this new population came from Asia originally as the comparative philologists seem to agree in believing, or whether it was only reflected from the coasts of Asia Minor and Syria like a wave originating in the west or south, a view defended by Brugsch in his discussion of the seat of the Tahmu race and others affiliated with it in the times of Ramses II. 1400 B.C.†; or lastly, whether it came direct from the great centre of Berber or Numidian life, by Malta, Sicily and Spain, as Desor and other explorers of the Dolmen monuments seem inclined to favour,—in any case, such a population, endowed with Philistine (Phœnician or Pelasgic) arts and arms, would feel themselves no more embarrassed by the aborigines whom they found *in situ*, than the Quakers, Puritans, Cavaliers, and Catholics of the British colonies were by

* Paris, 1864. Reviewed in the *Bib. Univ.*, Lausanne, xxx. No. 118.

† *Geographie der Nachbarländer Aegyptens*. 4to. Leipsic, 1858.

the red Indians. The one race would disappear slowly before the other without a deluge, or be absorbed into it.

But the subject of the apparent disappearance of these mortuary rites from western Europe becomes more highly complicated when we add to it the equally mysterious disappearance of all subsequent traces of that early art which has so astonished antiquaries recently, by the admirable productions which it left entombed in the caves of Perigord. 'What' asks Dr Broca * 'has become of this indigenous civilization, so original, so different from all we know? Did it disappear by slow modifications? No; it vanished suddenly, leaving no trace behind, and everything permits us to believe by force. Following it without transition we can discover nothing but the imprints of a powerful, religious, warlike race equipped with a perfected armour and knowing how to polish silex, but otherwise not disposed to industry, and total strangers to all art sentiment. Sufficient indication of a brutal and conquering invasion! The cave-dwellers of the age of Stone, who had acquired the mastery of the soil, and had succeeded in extirpating the last of the great mammals of the Quaternary fauna, did not know enough to defend themselves against the irruption of barbarians; and so we see a sort of *pre-historic Middle Ages* intervene, succeeding to beautiful days of a more ancient premature civilization, the origin of which is as yet entirely unknown.' But probably these people of the reindeer sculpture, so advanced in some respects, were merely the somewhat softened and polished offspring of the ruder savages of the epoch of the old diluvium. In more than one cavern the lower layers of the soil contain rhinoceros and mammoth, while the upper hold only reindeer bones. The flints of the second epoch were worked by simple percussion precisely like those of the first epoch, only that the flakes were smaller, and therefore the work finer. No rubbing was employed in either. The knives of both epochs are precisely alike. We may then conclude from the sculptures of the *reindeer* cave-men of Perigord that the still more ancient *cave-bear* people of the grotto of Aurignac had begun to make designs. One such, in fact,

* Address before the Anthropological Society, *Hist. des Travaux de* 1855-6.

has been discovered by M. Garrigou, in another Pyrenean cave—a pebble, on which are cut the outlines of a bear.*

It would seem in fact impossible for a race, however low in mental capacity, to continue for many generations pecking away at flint nodules to make weapons, and at marrow-bones to obtain food, without developing ideas of form and the desire of producing them at will. Just so the ceremonial rites of interment must have grown up slowly from the most imperfect and accidental beginnings; and any ideas of a hereafter must have been educed by chance from the accidents of life, through the religious faculty; just as accidental likenesses in stones and bones, and chance marks which were made on them by human teeth and flint knives, must have provoked the artistic faculty to rouse itself to attempt æsthetic shapes.

All this was consistent with the lowest grades of savagery. I have said in a former lecture † that all evidence is against the cannibalism of the Scandinavian aborigines. But in other regions cannibalism may have prevailed. The subject has become lately a favourite and fruitful theme of discussion; and the evidence against the aborigines is growing formidable. At the recent festival at Salisbury in honour of the opening of the new Museum of archæological relics Dr Thurnam read a paper on the round-head people of the round barrows (corresponding to the *hügelgräber* of Germany), and the long-headed people of the long barrows (*reihen gräber*). He asserted the priority of the latter and their evident addiction to human sacrifices. Mr Stevens stated that the human bones found in the pit-dwellings lately opened at Fullerton were all split and broken like those of the animals with which they were found. In the Belgian caves the same fact has been remarked. M. Garrigou (and M. Roujou also) has exhibited human bones from the Pyrenean caves on which exist marks of methodical percussion, intended for opening the medullary canal. Dr Clement, of St Aubin in Canton Neuchâtel, has found the arm-bone of a boy with numerous pointed teeth-marks on its sides and ends.

War is the normal social state of all savages; war with

* 'Which by the length of its cervical spiny apophyses resembles more the cave-bear than any other known species.'

† Pages 130, 131.

the beasts, war with encroaching clans. Their style of war was to be crafty, treacherous, and consequently cruel. The growth of religious ideas once introducing sacrifices, war offers human victims, and hunger baits the temptation sooner or later, which when yielded to, becomes a habit; and habits are hereditary. The traces of this custom are visible in the most civilized nations of antiquity. In Rome and Greece locks of human hair were laid upon the altar. Human effigies, built up of rushes, were on certain occasions solemnly thrown into the Tiber. Mr Blyth thinks that the same explanation will suit for the red powder which the Hindoos throw about upon each other in their religious festivals.

But whether flowers, or food, or incense, or ornaments and arms, or horses and slaves, or hecatombs of captured enemies were offered in the sacrifices of the advancing ages—all these rites, however beautiful some, however horrible others, were but the many-sided aspects of one aboriginal idea, the primitive religion of mankind, the pure and simple worship of the dead.

I have said the pure and simple worship of the dead. What, then, was the aboriginal savage's idea of immortality? A life beyond the grave; no more, no less. How then did it differ from the Egyptian, Greek, and Roman ideas of the state of the departed; and from that faith which the Christian casts as his anchor into Heaven?

All things are valued by relationships. A life *this side* the grave cannot be the same for any two living beings; how can the life *yon side* be other than most manifold? And its idea, if not mere book-lore, must be likewise manifold. The Egyptian's eternal mansion was a combination of Palace hall and Parisian restaurant. The Greek of Homer's day anticipated an Elysium such as Ossian sang. The artists and philosophers of the Empire half believed in a Hades of pensive, ennuied, gentle, garrulous and regretful shadows, such as Dante has described, and Boccaccio's 'Decameron' embodies in more earthly substantiality. The savage knew nothing of life but its wants and woes, its haggard forests, death chills, demon-like wild beasts, famines, incurable diseases; what could his faith in immortality do for his hooped and shackled nature? His

worship of the dead was but the germ of a religion, a mere instinct of his animal affections — nothing more.

The heaven of the Christian is a blinding reflection from the skies of all the beauties and sublimities that the eye of the poet has seen upon the earth; of all the sweetness of this life that the heart of parent and lover has ever tasted; of all those sun-lit regions of science which the latest civilizations have conquered and possessed. The immortality of the ancients was the immortality of the dead, with their faces always turned regretfully towards the life that they had lost, because it was real life; while their immortality was but an eternal death, without an object and without activity. Jesus came and stood and said, 'God is not the God of the dead, but of the living;' therefore we say of Him that 'He brought a *living* immortality to light.'

Yet after all, the Christian religion is but the ancient worship of the dead, sublimated, glorified, intensified, made more concrete in its objects and details, and concentrated upon one figure around which all its ceremonial is grouped.

II. The second type of religion is that of the worship of the powers of nature. Fetichism is its lowest form; astrology and fire-worship its highest forms; but in every aspect its essential nature consists in the worship of the material parts of the world, under the false impression that they possess powers which they do not. This ought to be distinctly understood. There is a true and reasonable worship of the powers of nature, which regards their just sublimities, loves and respects their concurrent harmonies, burns with a grateful sense of their blessed influences on the life of man, and shudders at the imagination of disasters which the understanding can explain and even sometimes can predict but not prevent, nor even yet perhaps escape from.

But a Fetich is a natural object superstitiously beloved or feared because supposed to possess unknown, peculiar, or magical powers. A fetich is a thing personified by ignorant people so as to be considered *able to act*—1. voluntarily; 2. under the influence of a kind or unkind feeling towards man; and 3. with some other kind of power than its nature would suggest.

The earliest Fetiches, no doubt, were stones and sticks.

A stone, for instance, has the power to lie still where it is put, but not to get up of itself; it can roll down-hill, but not up-hill. Imagine our horror at seeing a rock slowly and deliberately rolling itself to the top of a hill! or an Alpine aiguille nodding to us and standing again erect! Yet that is the horror of the fetich. One of the most effective scenes in the spurious continuation of Bunyan's *Pilgrim's Progress* is that where the wretched man is hurried off by demons towards the mouth of the pit, while all the trees along the road-side draw back their branches from his despairing grasp except two twigs, which mercifully advance themselves, and by which he holds on and is saved. *Amadis de Gaul* and all the romance literature of the days of chivalry abounds in this conception by the imagination of a voluntary, kind or malignant, power, resident in things. It is the characteristic of our dream life; it makes nightmare nightmare. It characterizes all child life. It makes itself dominant not only over the savage population of the globe, but over the most cultivated minds at special times, and in respect to special things. I have known a well-balanced mind, set free from all superstitions but one, ascribe a prophetic power of mischief to broken glass. I have heard the most enlightened and liberalized people confess to a superstitious faith in those charming fetiches the precious gems; and innumerable are the beautiful legends on record respecting their magical powers. I have myself worn for four years an amulet which no money would buy; and since I have worn it my life has been most prosperous. I will show it to you—it is the nail on which John Brown hung up his coat and hat all the time he was incarcerated in Charlestown jail. A friend of mine, a brigade surgeon in General Patterson's army, the first man who entered the cell when our troops occupied the place (in 1861), looking round the room saw nothing he could bring away for me but this one nail, which the jailor told him had been thus used,—I hope it is my only fetich.

What married woman in this audience of Boston *Illuminatae* would not feel heart-sick with a nameless premonition of impending evil if her wedding-ring should snap asunder? That is her fetich. When the sword fell from

the castle-wall, the seneschal never thought of ascribing it to the fatigue of leather, but to a voluntary ability in the sword itself to sound an alarm of danger to the noble house of whose possessions it had been both grantor and guarantee.

It is impossible to enumerate the instances of existing fetich worship in the uncultivated world. The worship of the horse-shoe is still almost universal; I may explain its origin hereafter. So is the observance of the divining rod, which has a similar origin. Of ten or twelve thousand wells bored during the last eight years in the Venango county oil-region in Pennsylvania a thousand (more or less) were located by diviners with a divining rod; or with a pendulum made of a deerskin bag enclosing a ball of musk; or by spiritualists falling into trances and executing spasmodic evolutions when they felt the influence of the spot to be selected. There is a popular lecturer on geology whose wife practises the profession of a spiritual explorer by help of this kind of fetich. The other day she held a piece of antimony ore to her forehead and immediately fell into a rhapsodical description of a charming lake-country, in Canada, through which the vein of that ore runs. I have seen shafts sunk after silver in the glades of Somerset county, Pennsylvania, under the dictation of an old scamp who would lay in his hunting cap a small looking-glass which had cabalistic characters on the back of it and was called an erdspiegel; and then hiding his own face over it he would describe the depth exactly to an inch of all the mineral wonders that he saw beneath the surface. So strongly did the imagination of this fetich act upon his workmen, simple old German immigrants from the mother-land of superstition as they were, that they affirmed with all their faith that when at work at the bottom of their shaft they could distinctly hear invisible agents laughing, talking, pounding, picking beneath their feet, removing the treasure downward out of reach; for of course they never found it.

Now if all this and a thousand times more of it be possible in our day, in this fresh land of honest, open work, compelling nature to say all and no more than what she knows—to do all and no more than what she has the power to do; leaving no hole or corner of the globe an

unexplored retreat of the mysterious; with libraries full of demonstrations of the exact ability of every created agency to harm or heal us; with public schools to save our sons and daughters from the ineradicable first infection of this superstition of the fetich, how overwhelming a deluge of it must have submerged the early souls of men; those hapless savages who trembled at every leaf-fall and fled with averted faces from every natural object a little out of the ordinary shape.* What more inevitable than that such shapes as isolated pillars of rock, stones curiously perched on peaks and movable by the hand's touch, and ambrose stones, cheese-rings, boulders in river currents, labyrinthine caves and horrid clefts between high crags, made grandly vocal with the voice of cataracts and with the awful roar of beasts; what more inevitable than that these objects of nature should come to be feared and worshipped? †

This was *sure* to be the case when they imitated even in the least degree the forms of man or beast. Such a pillar of red saliferous sandstone capped by a fragment of a layer of white limestone as the traveller may see standing half way up the mountain side and overlooking the west shore of the Dead Sea, was sure to have some horrible Lot's-wife legend attached to it. Two months ago as I passed along the southern shore of the Gulf of St Lawrence, rounding the point of Gaspè, I saw a rock called the Old Man, and was told that some few years ago another stood beside it called the Old Woman, but the surf had carried that away. The ocean is a great artificer of such rude effigies, making and breaking them wherever there are suitable rocks on any coast. And the ancient savages were fishermen, and lived upon the coast, and sailed among these cliffs; and many a father's dead body was found near some remarkable rock, which grew to be the special object of his children's reverence; and many a legend of dead warriors got mingled up with new-formed

* See good instances mentioned by Livingstone.

† See in 'Harper' of November the account of the Indian worship of Mount Popocatepetl, 'the smoking mountain.' See the picture and description of Mount Barkal, in Upper Egypt, by Lepsius, Reise. See also the views of the cleft mountain behind Delphi, in Greece, and the cleft rock in front of the temple of Philæ.

prodigies of the erosive powers of the sea; transitions from ancestor worship to fetich worship, and mixtures of the two. In this way we can explain the frequency of legends of animated stones, and human beings turned to stones, and in fact all the phenomena of early idolatry, together with that other class of legends wherein trees are substituted for rocks, maidens changed into laurel and myrtle and cypress, spirits confined in oaks, and the whole range of similar superstitions. But I shall show you hereafter that even for these superstitions there was a solid historical basis, apart from all disposition in the human imagination to personify and deify or diabolize the beneficent and noxious qualities of natural things. We must never forget that Druid priests lived under oaks, and their spirits were supposed to haunt them afterwards. The hunter who fell from the rock was supposed to become identified with the rock. Superstition acts upon material objects to convert them into fetiches just as heat acts upon a bar of iron to make of it a magnet. It was not the height of the rocky summit that evoked the savage's devotion, but the remembrance of some salvation there; it was his Ararat. It was not the tickled fancy which grew reverent before the natural rocking-stone. It was its unaccountable and imposing resemblance to the boat which had been to his race both mother and father in one—obtaining for him food in life, saving him in storms from death, and furnishing him with a burial-place—that made him reverent.

But the intellectual ground of fetich worship is now, and always has been, ignorance of natural history. The fetich is the first physical object which strikes the bewildered eye as wanting its own explanation. In this sense the range of the fetich is immense. It is not confined to sticks and stones. It ascends to the platform of classic art. The Greek priests made their statues live and move and speak and weep, as Romish priests do now. Memnon's statue with its sunrise music was a splendid fetich.

We can ascend still higher. I have mentioned the worship of gems, endowed with superhuman intelligence. But there is a far more refined fetichism than that. The whole system of the Cabala is built upon it. In ancient times extraordinary powers were assigned to words and numbers. They were treated as entities, powerful entities.

You know how full the stories of the Thousand Nights are of this. The name of Solomon was the most powerful of all fetiches. He who could speak it rightly could bind and loose spirits, fly like a bird, and in fact command all the powers of nature. The King of the Genii was confined thousands of years in a casket merely because Solomon's seal was upon it. The story has been repeated in many forms. Asmodeus was thus shut up in a modern magician's phial. No satisfactory explanation of this class of superstitions has ever been published, to my knowledge. It must have some basis in real life. Primal error, which is a nothing, cannot bear fruit. The Pythagorean system of Philosophy turned on the magic powers of numbers. There is a great disposition in the human mind to dwell on coincidences. We are fascinated by the magic square, for instance, which adds up the same in all directions. I was once introduced to a learned Rabbinical scholar living in Berlin. His room was so full of tobacco smoke when I entered it that I could hardly discern his form at the far end. But I soon found that his head was so much fuller of talmudic and cabalistic lore that it was impossible to see any truth through that fog. He assured me that there was such power in a name, that the moment of the christening of a child was the most solemn and sublime of all the moments in his history. For as he was named so he became. The name had the power of destiny, and involved in its own letters all the events of that child's existence.

Now how could such a curious system of fetichism arise? I have given you the explanation, in part, in my lecture on the alphabet. The letters of a name are symbolic; their conjunction was cabalistic. But fully to comprehend the importance of a *word* to the old nations, one must imagine for himself the rise of the secret priesthoods, the sacred mysteries, the freemasonries with their signs and pass words.* Solomon was the representative Cell Man, or Cabalist, head of all the orders of freemasons clerical and lay, so to speak, that have ever existed.† His name

* דַּבָּר DaBaR, Hebrew, *a word*, is the same as דְּבַר DeBiR, *the tabernacle* of Jehovah.

† Solomon, Shalmanezzer, Carloman, Charlemagne, such names are maypoles upon which have been hung all the garlands of mythology, for the nations to dance around. Solomon calls himself (if he wrote the book)

was, in fact, the embodied idea of the *Mystery*; it stood for the whole body of occult lore. But it therefore stood for the whole political power of the initiated classes. Its use by any man was a guarantee of his good standing in the society, of responsibility as a messenger, of authority as an agent. All the spirits of the throne and the pulpit, the work-bench and the writing-table, were obedient to it. Hence, legends like that of Prospero and Ariel; Faust and Mephistopheles; Friar Bacon and Father Bungay; legends so devised as to conceal the real spirits, the real magicians, and the real words-of-command; but legends which, doing this work for their inventors, did also another for themselves, infused into the common people of every race a fresh and more subtle spirit of *mystic fetichism*, so penetrating and intangible in its character that the wisest, most learned, and most holy men of modern times have not escaped its influence. For,

One step more, and we reach the highest grade of fetichism, rising insensibly from all before described. What is an orthodox creed, but a *mystic word-fetich*? Look at the wafer elevated by the Romish priest in the sacrifice of the mass as a piece of God-man—thousands prostrate before it, not daring even to look at it, so awful is their dread of its power to bless them and to curse them, to annihilate them instantly! Yet that is merely a *thing-fetich*. Look now at that dogma elevated by the Protestant preacher before the logical understanding of his audience, whose souls lie prostrate in the dust before it, not daring to use their reason on it, or to look it for a moment in the face, believing, as they must that to doubt it is to be damned! That is a *word-fetich*.

What is the school of Gausson and Hengstenberg among theologians but a sect of Christianity retiring from the noble reverence and practice of the Spirit of Christ and his apostles and from the sublime conceptions of the Hebrew poets and dropping backward and downward on to the ground of literal fetichism; worshipping

in the beginning of Ecclesiastes, the Cabalist, or *quelt* (קלט,) which our translators have rendered *preacher*, without knowing that to *preach* = to *bark*, i. e. to speak oracularly (Arkitely); as, to *pray* = to *bray*; and as, to *gabble*, or talk *gibberish* = to *gobble*, i. e. to speak *cabalistically*, or in a manner unintelligible to the uninitiated or common people.

the letter which, Christ says it, must kill ; and converting the literature of all the Hebrew ages from David and Solomon to James and John into a gilt-edged quarto bound in calf ; putting a more fatal stop to the progress of the Christian Church towards its millennial purity than ever did the golden calf which arrested the progress of Israel into their promised land ! There are multitudes of Christians living now who entertain so strongly the old Jewish reverence for the word Jehovah that they bring themselves to pronounce it only with a strenuous effort of the reason and the will combined. It is not simply from reverence for the infinite God whose special name it is supposed to be—but reverence for the *word* ; because it was for ages one of the great world-fetiches and called ‘the unpronounceable.’ Laymen had no right to take it on their lips. It was a privilege of clergy. It was fetich—or tabu—for the outside masses. Why ? Because it lay at the heart of the special religious system of the Hebrews : because it was the supposed formula of Unitarian doctrine as opposed to all idolatry ; because it was translated ‘the *living* God’ and itself shared a sort of weird *life* ; because it was the word-temple in which dwelt the shekinah of all transcendental science ; veiled, but ready to break forth in fire and light ; veiled like Isis, but before which the initiated priests might worship trembling and alone. It was, therefore, to the ancient Jew, and still is to the devout but superstitious Christian, an awful silent logos.

In a still more distant east we have another instance of an unpronounceable word, a fetich formula, the key to the mysteries of another system of religious worship : I refer of course to the sacred syllable **AUM** of the Brahmans. It is said to be of no known specific meaning, but to involve in some way the idea of the Trinity. Now we know what the Hindu trinity is : Brahma, Vishnu, Siva ; the maker, preserver, destroyer. But why these three are so related to each other and to human history, or how they can be distinguished by the letters **AUM** (or any other mode of spelling **OM**), has not been clearly stated ; nor can I venture to demand your long attention this evening to what I would consider the true demonstration of the curious problem. I should make it on Arkite grounds ; by which I mean that the word itself, *as pronounced*, has always

been the symbol of Arkite *mystery, secrecy, and initiation*; being the representative of the roar or murmur of the great deep. **Mim** is the Hebrew name for the waters of the sea.* **Amim** is the Hebrew name for multitudes of peoples, the roar of which goes up as the voice of many waters. I have shown you that the shape of the letter **M** was obtained from the water-waved surface of the sea. You are all probably sufficiently acquainted with the pictures of the Hindu pantheon to recognize in Vishnu the Fish-Noah, or god of the waters, sleeping upon a coiled serpent, the symbol of water, and representing the preserving genius of the ark. Brahma as the father-creator represents the genius of the mountain. And Siva, the destroyer, his name being identical with the Typhon of the west, represents the devouring deluge. Then, although the three letters **A U M** are of western form, and the analogous Sanscrit letters have been so changed as to conceal their old meanings, the identity of the **A** with Brahma, **U** with Vishnu, and **M** with Siva, follows as a matter of course; and there is no longer any wonder that this **Om** is too dreadful a fetich to be pronounced, and too sacred to be taught by any Brahman to a man of any other caste. And yet in spite of the prohibition it has escaped. It leaked out into many languages in the earliest times. It formed part of many of the most sacred western words; such as, *Omphalos*, the navel, a name for the Delphic oracle; *Triomphé*, the cry or watchword of the priests of Bacchus; *umber* and *imber*, darkness and storm; *amber*,† the precious electron found floating on the waves. The Irish Druids called by this name, *Omh*,‡ the living God, and defined its meaning 'He who is.' There is very little doubt that it is the *Ob* or spirit of divination mentioned in the Hebrew scriptures, and the *Obi* or necromantic power of the blacks of Western Africa. It is not

* Egyptian ham-ham, to roar (Bunsen, vol. i. p. 462); Coptic *hem-hem*, to roar, hm, to fish, p. 463; mhi, to draw water, p. 469; mah, water (Bunsen cites Leemans, viii. xiv. xvi. for this, on p. 468).

† *Am*, Egyptian, gem or pearl. Bunsen, p. 455 (Coptic *ana-mei*), and *ann* (p. 456).—

‡ Cf. *Amn*, Egyptian name of Jupiter, Coptic *amoun*; and also the Egyptian verb, to conceal; Coptic *amoni*. Compare with this the Amen of the Hebrew, and the Egyptian *ma* (Coptic *me, mei*), truth, true. Cf. also *amut* (Coptic *amen-t*), Hades; and *am-t* (cf. *ouöm*), devourer.

impossible that it occurs in such modern words as *humbug*; for the second syllable of that word is undoubtedly (like *bugger*, and *bugaboo*) the Scythian *bog*, once meaning *god* (Bacchus) and now *devil*. It probably occurs in our word *Umpire*, or judge in equity, but refers in this case not to the man, but to the bar or court whose laws he but administered.

The unpronounceable divine name among the Hebrews is perhaps the best introduction we could have to the history of the third type of religious worship which I have now to describe.

III. The worship of the gods in heaven.

You may remember that our first type of religion involved the worship which the early inhabitants of the earth paid, and many of its present inhabitants still pay to their dead parents and ancestors. The second type of religion, the last described, coeval in its origin and co-extensive in its duration with the first, was fetichism, the worship of the powers of nature as expressed unintelligibly or magically in the objects of sense—mountains and seas, rocks and trees, sounds in the air, works of art, and words and creeds constructed by the priests.

Now the third type of religion is the worship of the invisible God as a creator, preserver, benefactor, and judge.

It has been the central question of all critical theology how this religious conception was generated in the soul of man. Was it aboriginal? Or has it been developed gradually by civilization? Was it *revealed* at first? Or did it reside as an innate *co-essential* germ of intelligence in the human intellect as such? Was it the common property of the earliest people and afterwards lost amid the sins and miseries of migrating races, enslaved races, isolated races, perishing races? Or was it committed as a sacred and peculiar privilege to one chosen people for safe keeping until the fulness of times had come and the Son of God was revealed and the new dispensation was inaugurated and the apostles were sent forth to fill the earth with the light and warmth of that 'life eternal, which is the knowledge of the true God, and of Jesus Christ whom he hath sent.'

Of these theories, the last is held to be the true one by orthodox Christians. But it is opposed in many points to the results of that criticism of the religious history of man-

kind which the modern sciences have forced the honest seekers after truth to undertake. Of course I will not have time this evening to pursue the discussion far. But I must at least point out the place where men of science stand to view the rise of the divine idea in man—that glorious sunrise of the soul—the only sunrise in the history of mankind.

The idea of an invisible God finds its only analogy in the knowledge which the domestic relations give to children of their parents. It is reasonable therefore, that it sprang as a natural development out of the worship of dead ancestors. If the idea of God be that of a being invisible, creative, provident, protective and judicial, it differs *in no respect* from a combination of the two ideas of a living father, and a father who has entered his eternal mansion. Do you object, however, that the idea of God is far grander? I grant it: but that is a matter of *degrees*. The definition of the young minister which took by storm the suffrages of the Assembly of the Westminster Divines:—‘God is a spirit, infinite, eternal, and unchangeable, in his being, wisdom, power, holiness, justice, goodness, and truth,’ was the glorious consummation of all the religious feeling and reasoning of all ages—the flower of human thought, ripened in the choicest soil of the last deposits of the waters of civilization. Wisdom, power, justness, goodness, truth! What are these but human attributes on which the whole superstructure of ancestor worship has been built? But the three epithets, Infinite, Eternal, and Unchangeable, are transcendental ideas, evolved by science; abstractions, only possible to well-formed, well-bred brains; enlargements of the savage notion of a father’s character by civilized thinkers whose material horizon has been widened by travel; whose astronomy has changed its starry firmament into realms of interstellar space; whose lives of leisure have allowed free scope for poetry as well as practice; and made love, not fear, the law of thought. Love is, like heat, the great expander. God is a product of philanthropy.* The shivering,

* Benevolence is an unknown instinct in the lower animals until they are domesticated with mankind; for their love of offspring is not only selfish, but provisional, and in all its exhibitions savage and cruel. Benevolence is foreign also to the animal part of man’s economy; the

hungry, timorous savage of the earliest days had not enough of love about his house to make a small-sized god of. Infinite! Eternal! Unchangeable! Men could *begin* to comprehend such epithets—to invent them rudely I should rather say—when they began to build pyramids and ‘eternal mansions’ for their departed great: but not before.

We find, therefore, no trace of *our* idea of Deity in the earliest history of mankind. The Hebrew writers *report* indeed such traces; but their reports are not evidence because not contemporary. They only go to show what was the idea of God among the Jews *after the times of David*, subsequent to whom all their Scriptures seem to have been written. Or, if the earlier books should be considered as compilations from fragments of an older time—an opinion now placed almost above discussion—such fragments prove, not that our idea of God existed at the beginning of history, but, on the contrary, that it did *not* so exist. You will find an admirable *resumé* of the evidence of the truth of this statement in Chapter V. of a book by William Rathbone Greg, entitled *Creed of Christendom*. You need, however, merely refresh your biblical memories, and recall a few texts, to see at once that the common notion of a special revelation to the Jews as a peculiar people of the fact of the existence of One God has no foundation whatever.

Milman and others speak of the *pure monotheism of the Jews* as a singular phenomenon, confined to the narrow strip of land called Palestine, where ‘the worship of one Almighty Creator of the universe subsisted as its only sanctuary, and where, in every stage of society, under the pastoral tent of Abraham, and in the sumptuous temple of Solomon, the same creed maintained its inviolable sim-

stomach laughs at it; but the savage is little else than a reasoning stomach; he immolates his parents, and exposes his children, when they cease to benefit his own life, or gratify his own desires. Benevolence did not enter—could not enter into the early idea of a God. The Hebrew Jehovah is a selfish personage. The Christian God is Love itself. It is not made out whether *good* is from *god*, or *god* from *good*; or whether indeed there is any direct connection between these words.

plicity.* No! Their own writings show that they were incessantly and unconquerably idolatrous. No punishments could cure them. The High Priest of Jehovah is described as worshipping the Egyptian Apis while Jehovah was thundering his law to this high priest's brother on the top of the mountain before their eyes. And when that law came down in his hands, it contained no notice of the doctrine of an only true God. Its first commandment merely forbade the people to whom it was sent from worshipping *any other* than their own God.

The fact is evident, that Jehovah was the family God of the Abrahamidæ; and *therefore* became subsequently the national God of the Hebrews. I do not mean by this, a family god in the sense of the ancestor worship; but a god considered by the Hebrew progenitors of David and Solomon, whoever they were, as the *lar* or *δαίμων* of their house. It looks as if it were an adopted deity, adopted by the Hebrews (if they were Hyksos) from the Egyptian **NUK PU NUK**, the 'unknown God,' the male Isis, whose veil could not be raised; the god who refused to tell his worshippers his name; a name in fact in process of invention. The story reads that this God *called* Abram out of Ur of the Chaldees; of course the call came from the God at his own home—in Palestine; he was a western deity. The story says that Abram's parents worshipped *other* gods (although in Gen. xxxi. 53, we read, 'the God of Abraham, the God of Nachor, the God of their fathers judge betwixt us'!), and that his children's cousins at the old eastern homestead continued to do so afterwards. The Jehovah was evidently a western deity. His other Hebrew name, Adonai, shows this still more plainly; for it is the Adonis of the Syrian worship, and was introduced into the pantheon of Egypt by Amenoph IV. a Pharaoh of the 18th dynasty, who took this God's name instead of Ammon's in his own, calling himself no longer *Amen-oph*, but *Khou-en-Aten*, or the *splendour of the solar disc*. Aten, 'the radiant disc,' was then the Syrian Baal-Adonis, introduced into Egypt by the Hyksos of the previous (17th) dynasty, under the name of *Sutech*. How it happened that a native Pharaoh, a lineal descendant of Amosis, the ex-

• Hist. Jews, i. 4.

pellor of the Hyksos (through Amenoph I., Thoutmes I. and III., Amenoph II., Thoutmes IV., and Amenoph III.), should forsake Ammon, persecute the old Egyptian ceremonial, and become a fanatical propagandist of a special form of Hyksos-Shemite faith, can only be explained by reference to the fact that his mother was a foreigner. Her pictures at Tel-Amarna have rose-coloured (i. e. northern-coloured) flesh. His own most extraordinary profile hints at a strange and tragic family origin; while similarly strange-faced priests standing around his figure at the altar, on the monuments, intimate that his reign was a temporary revolution in favour of the only half-expelled and half-suppressed Hyksos population of the Delta—a momentary triumph of that worship, every trace of which the next Pharaoh (Horus) did his best to obliterate; but which still survived in secret under his successor Seti I., the founder of the 19th dynasty, and then was re-established as the worship of Seth by the great Ramses II. and his unfortunate son Menephtha, the so-called Pharaoh of the Exodus.

Thus a direct connection is established between the Mosaic worship of Jehovah-Adonai, the Hyksos worship of Seth-Aten, and the later Israelitish worship of Baal-Adonis; and any noble character discoverable in the first must be related to what natural refinements the already long-existing civilizations of those countries had already been enabled to produce. In later times we are expressly told that the Jews of the twelve tribes worshipped Jehovah and Baal together.

But not to hurry on too fast, let us remount from the 19th to the 12th dynasty, and return from Moses to Abraham; for men's ideas are wonderfully changed in fifteen hundred years, or even in five hundred, to take the Hebrew chronology for our guide.

The legends of Abram's God Jehovah exhibit him to us in the most anthropomorphic garb—the least spiritual and Christian possible. He sits with Abraham at the door of his tent. He eats with him; getting into an angry altercation with Sarah, the patriarch's old wife. He discusses with him the case of Sodom and Gomorrah; informing him that he was on his way thither to see if the reports he had heard of their wickedness were correct.

The legends of Isaac and Jacob are *equally explicit and compromising* to the god they praise. They describe Jacob's family as idolaters, and Jacob himself as only gathering their idols together and hiding them under an oak (Gen. xxxv. 2—4) when he approached the domain of his western family deity. They tell a story of the cunning fellow regularly bargaining with Jehovah to take *him* for his God on certain conditions, and promising a tithe of his possessions if Jehovah would fulfil his part of the contract (Gen. xxviii. 20). To whom the tithes were to be paid, or for what end, is not stated; but this mention of an arrangement of tithes betrays the late date of the history in which the story occurs.

It was not until the Abrahamidæ came in contact with the civilization of Egypt that we begin to see any tendency of their Jehovah worship to rise to a higher intellectual level. Moses—a character representing the New Egyptian phase of Hebrew (or Hyksos?) life—takes one great step in advance of his forerunners. But even Moses makes no claim of *sole* existence for his nation's deity; but only insists that he is superior to all other gods; the Jehovah Elohim, Lord of lords, and God of gods.

In Exodus xv. 11, he is made to say, 'Who is like thee, O Jehovah, among the gods?' He is always represented as speaking to Pharaoh of Jehovah not as Supreme Ruler of heaven and earth, but as the God of the Hebrews; and to the Hebrews, 'I am Jehovah thy God, who brought thee out of the house of bondage; thou shalt have no other gods beside (or before) me.' What is true of the legends of Moses is equally true of those of his successor. In the 24th chapter, Joshua is made to urge upon the people fidelity to Jehovah, not at all on the ground of an exalted Monotheism, but because it would be the blackest ingratitude in them not to prefer the God who had heaped such favours upon them to all other deities. The subsequent records of the nation, as far as they can be considered historical, become a monstrous paradox in psychological research if we suppose that there existed at that time in the Hebrew mind any idea of one true God such as we possess.

In fine, these records are full of charges against them of *infidelity to Jehovah* but do not contain one single charge

against them of *Atheism on that account*. No wonder! Do these records ever describe Jehovah in language such as a modern civilized thinker would dare to use? On the contrary, they tell us that Jehovah said to Moses: Let them make me a sanctuary that I may dwell among them (Exod. xxv. 8, 21, 22). Put the cover on the ark, and there will I talk to thee. And Jehovah spake with Moses face to face as a man with his friend (Exod. xxxiii. 9, 11). And Jehovah said, I will put thee in a cleft of the rock, and will cover thee with my hand, while I pass by, and thou shalt see my back parts (Exod. xxxiii. 21—24). Moses is described as piquing the *amour propre* of the Hebrews, by telling them how it was reported among the surrounding nations that Jehovah was their God and was seen by them face to face (Numb. xiv. 14). He is described as pleading with Jehovah when very angry, and nobly offering himself as a victim to his wrath, and thus gaining a respite and commutation of their punishment; which, however, involved an entire change of the whole programme of the Exodus, a change of base for their military operations, and the postponement of their invasion of Palestine for the mystic number of 40 years.

Surely all this is merely a slight modification of those far more ancient and semi-savage ideas of deity which appear in the legends of the creation and of the flood, where Jehovah is said to make woman out of a rib of man; to take Noah and 'shut him into the ark;' 'to smell a sweet savour' when Noah liberated made his first sacrifice; to invent the rainbow; and to promise no more 'to curse the ground for man's sake.'

But time went on. The wars of settlement, the civil feuds of rival judges, came to an end. The poet warrior and the regal philosopher sat in turn upon the throne of Zion. Peace bore its proper fruit; commerce enlarged the native genius of the Jew. Priesthoods devised grand ceremonials. The discussion of false mysteries sharpened the soul's perception of the true, as alchemy in our day led on to chemistry. Luxury bred vice, and the miseries of despotism generated a reactionary patriotism. The school of the sacrificers found itself confronted by the school of the sacrificed. Prophets arose to denounce the priest, and die for it. But as they died, the heavens

opened, and they caught those visions of the one true God which were to become the living realities of after ages. Calamities crushed in upon the little remnant of that kingdom which David founded, and Solomon illuminated with his taste and wisdom, idolater and sensualist as he was. The poor 'favoured people' were meal between the millstones of Egypt and Babylon ground to the finest flour. Their anthropomorphic deity vanished like a powerless, mocking spectre before the irresistible wind raised by migrating nations. But in its place arose the sun in a sky which if not clear was hot and bright. The abstract idea of God as a unit, an Infinite one, on whose strong arm Nature the mother and Man her baby child could always lean with confidence and ever-springing hope—of God the sole creator, sole sustainer, sole judge and executioner of justice—penetrated that broken mass of Hebrew people as the alkaline waters of the drainage of the rain penetrate disturbed and fractured regions of the earth's crust, permeating the entire substance, metamorphosing, crystallizing and charging it with veins of the precious metals.

It is impossible not to see that the God of the priests and the God of the prophets of Israel—and the same is true in our day—were two very different deities; the embodiment of two very different classes of ideas. 'Let any one, (says Greg) 'compare the partial, unstable, revengeful, and deceitful God of Exodus and Numbers with the sublime and unique Deity of Job and the nobler Psalms; or even the God of Ezekiel and Daniel with the God of Isaiah; and he can scarcely fail to admit that the conception of the one living and true God was a plant of slow and gradual growth in the Hebrew mind, and was due—not to Moses, the patriarchs, or the priests, but to the superiority of individual minds at various periods of their history.' This plant of Aryan growth was first planted in the mountains of Judea when Solomon, establishing his kingdom 'from the great River Euphrates to the Western Sea,' brought his people into contact with the pure Zoroastrian monotheism of the Persian plateau; and it came to flower when several centuries afterwards, the chosen people' were banished from their native hills to hang their harps upon the willows of Babylon; or

rather, we may say, were sent to school, tribe after tribe, back to the lands where their original ancestors first drew the breath of life.

It was Solomon who first learned how to say 'Behold, the heaven of heavens cannot contain thee, how much less this house which I have built?'* 'The eyes of Jehovah are everywhere, beholding the evil and the good.' †

It was no priest or Levite of the temple service, but David the young shepherd poet, or more likely yet, some later prophet whose verses equally dear to the hearts of all humanity came to be sung under that all overshadowing name, who chanted—'Whither shall I go from thy spirit, or whither shall I flee from thy presence?' 'Thou coverest thyself with light as with a garment; thou art clothed with honour and majesty.' 'Jehovah! who shall abide in thy tent? who shall dwell on thy sacred tumulus? He that walketh uprightly, and worketh righteousness, and speaketh the truth heartily. For the word of Jehovah is right, and all his works are done in truth.' 'He loveth righteousness and judgment. Lying lips are his abomination. But true dealers are his delight.' 'The counsel of Jehovah standeth for ever.' 'Thou desirest not sacrifice, else would I give it. Thou delightest not in burnt-offering.' 'The world is mine and the fulness thereof. Will I eat the flesh of bulls, and drink the blood of goats? If I were hungry would I tell thee? Offer unto God thanksgiving.' ‡

It was no Hebrew priest or Levite, but some Idumean sheikh of the eastern desert, who lived it would seem from the best philological criticism long after the days of Solomon, who said all those fine things in the Book of Job, like 'Lo, he goeth by me, but I perceive him not.' 'How should a man be just with God? he cannot answer him for one of a thousand. For he is not man, as I am, that we should come together in judgment. Shall a man be more pure than his Maker?' ||

The fine words which are put into the mouth of the first

* 1 Kings viii. Cf. *δύνασαι ἐξ οὐ πάντοσ' ἀκούειν Ἀνέρι κηδομένῳ.* *Iliad*, 16. 514.

† Prov. xv. Cf. *θεοὶ τὰ πάντα ἴσασι.* *Odys.* 4. 379.

‡ Psalms xxxiii., l., li., civ., cxxxix.; Prov. xv.

|| Job ix., xi.

of the prophets, the reputed teacher of David 'The strength of Israel will not lie, nor repent, for he is not a man to repent,'* give us still the narrow idea of a national god, and not of the universal and only God of the later prophets, such as was known to the author of the Book of Ecclesiastes, who threw the same idea into a much larger mould: 'I know that whatsoever God doeth shall be for ever; nothing can be put to it nor nothing taken from it.' †

It was in the midst of the desolations of Israel by the hordes of Mesopotamia that the greatest of the prophets expressed the Zoroastrian faith in those sublime words, 'To what purpose is the multitude of your sacrifices unto me? saith Jehovah.' ‡

And it was in the last convulsions of national extinction that the Prophet Micah proposed and answered the same awful question in the still sublimer words: 'Wherewith shall I come before Jehovah, and bow myself before the Highest God? With burnt-offerings, calves of a year old? Will he be pleased with thousands of rams, or ten thousands of rivers of oil? Shall I give my firstborn for my transgression; the fruit of my body for the sin of my soul? He hath showed thee, O man, what is good. And what doth Jehovah require of thee, but to do justly, to love mercy, and to walk humbly before thy God!' ||

Thy God! The cycle is complete. The God of Abraham had become the God of the ten tribes; the God of Israel had grown to be the God of all; and now this God of mankind is about to come incarnate to the individual soul to claim his last and highest throne of all.

It was the propagation of these splendid conceptions of deity subsequent to the Babylonian captivity, and after they had come under the Zoroastrian influence of Persia, which cured the Jews of infidelity to Jehovah, made them self-sacrificing Unitarians to the end of time, and prepared the way for the founding of the Christian Church. And we are probably to explain the rapid spread of Christianity at the outset by the wide diffusion of Jewish ideas previous to the birth of Christ among the sober-minded Gentiles of Western Asia and the Roman empire. But

* 1 Sam. xv. † Eccl. iii. ‡ Isaiah i. || Micah vi.

there resulted thence a strange mixture of monotheism with polytheism before the Christian Era, corresponding to the mixture of Christianity with every form of local heathenism which happened afterwards.

Professor Sophocles has lately published an ancient epitaph, dug up recently by a seeker for treasures of another sort, near the little town of Zerbhokhia in Magnesia. I will give you his translation of it.*

‘No other corpse, whether of a man or of a woman, is permitted to be deposited in this vault. And if any one shall recklessly dare to open it, he will anger the most great, the King, the Almighty Maker of all things; and all the gods, and goddesses, and demigods, and the lady queen herself. For the depositing of any other corpse with these is forbidden once for all.’

We could not have a better description than this epitaph affords us of that mixed or primitive theism which pervades the older Hebrew or Mosaic Scriptures, and which gave place to a grander and purer monotheism among the prophets of a later age.

The date of the beginning of this change then would be about 1000 years before Christ. We find in the Hindu Scriptures of that date evidences of a similar growth of the religious mind. ‘In the oldest portions of the hymns [of the Rig Veda, the most ancient of the Sanscrit books] we discover,’ says Mr Muir, the latest and best English writer on this subject, ‘few traces of any such abstract conceptions of the Deity. They disclose a much more primitive stage of religious belief. They are the productions of simple men, who, under the influence of the most impressive phenomena of nature, saw everywhere the presence and agency of divine powers, who imagined that each of the great provinces of the universe was directed and animated by its own separate deity, and who had not yet risen to a clear idea of one Supreme Creator and governor of all things.’ †

The hymns of the Rig Veda are hymns to Agni the god of Fire, Sūrya the god of the Sun, Indra the god of Storms, addressed each under a variety of names, and strangely mixed up together, and sometimes actually identified with

* Journ. R. Asiat. Soc., New Series, i. 2, p. 339.

† Proc. Amer. Acad. p. 77, 1864.

one another. But, as Muir and others have shown, there are strains in these ancient hymns which seem to come from some inner sanctuary, revealing a conception of divinity more spiritual and universal than the general tenour of the hymns. The grades of this spiritualism involved in the general materialism of the Vedic hymns are various. The reader can, as it were, watch the expansion of the poetic idea. Varuna is described as dwelling in a palace of a thousand columns, and a thousand doors,* before he is described as dwelling in all worlds, as sovereign ruler, possessed of illimitable resources, meting out, creating, and upholding the heavens and the earth.† The different earliest deities had their different admirers and special devotees. Each deity was praised in strains as exalted as the capacity of the worshipper, and as the growth of the religious ideas of his age. Hence, as the notions of space and time became enlarged, and the powers of abstract thought were cultivated, the pantheon swelled to colossal proportions; and each separate deity belonging to it became to his own worshippers the infinite and eternal God of gods; while yet retaining his own distinctive name and some relics of his original, local, and specific character.

The resemblance between the poetic imagery of the Hebrew and Hindu Scriptures of that ancient date is strikingly in harmony with the ethnological derivation of the Abrahamidæ from the land of Brahma. The Hebrew poet sings: 'The eyes of Jehovah are in every place beholding the evil and the good.' The Vedic poet sings: 'Varuna, the mighty ruler of the worlds, sees as if close at hand.' The Hebrew: 'Whither can I flee from thy presence? If I ascend into heaven, thou art there! If I make my bed in the grave, thou art there! If I take the wings of the morning, and fly into the uttermost parts of the sea, even there will thy right hand uphold me,'—is echoed by the Sanscrit: 'The earth belongs to Varuna the King, and the mighty sky whose ends are far away; the seas are his loins, though he lives in the smallest pool; let one flee beyond the furthest skies, he should not escape Varuna the King, whose messengers descend from heaven

* Rig Veda, ii. 41. 5; v. 62. 6; vii. 88. 5.

† Ibid. iv. 42. 3, 4; vi. 70. 1; vii. 86. 1; 87. 5, 6; viii. 41. 4, 5. 10; 42. 1.

and thousand-eyed traverse the earth.' There is in the Hebrew poems a sad, sweet, noble simplicity and intense spiritual personality, which is not so perceptible in their Indian contemporaries. There is also in them an absence of gross mistakes and exaggerations which place them on an eminence unapproachable by the admirers of their Sanscrit rivals; yet the common propriety which both these holy literatures have in all the essential elements of the divine idea is unmistakable.

This is especially true of the *later* hymns of the Rig Veda, and of the hymns of the Atharva Veda, supposed to have been not much, if any, less ancient. It is in these that we begin to find those grand titles: *Visva Karman* 'the universal architect,' and *Prajapati* 'lord of creatures;' but we notice that they are applied still to special deities: Indra, Savitr, Rudra, Soma, Vishnu, or Varuna. In the 121st hymn of the Rig Veda, for example, the deity is celebrated (under the name *Hiranyagarbha*) as 'arisen in the beginning; only lord of all; upholder of heavens and earth; giver of life and breath; god of all gods, and the animating principle of their existence.*

I need not follow this subject further. I confess I do not at all agree with the common explanations of the Hindu mythology, as published by Muir, Max Müller, and other Sanscrit scholars. Their theories seem to me to have no system. I think it is because they have no basis. They have not yet struck the key-note. In this course of lectures I have been gradually preparing your minds for a view of the subject, which I think *may* explain most of the difficulties which Sanscrit mythologists confess that they encounter. This is my tenth lecture. I have still one more to deliver. I have reserved the theme to which I have given most attention to the last.† I do not wish to scare you with a deluge of unintelligible words. I think I can repay your patience with a solid addition to your knowledge. I think I can show you an order reigning over the apparent chaos of ideas respecting the gods in olden times. I think I can put into your hands the right key to the door—the safe clue for the labyrinth. The ancient poets were *not* mad-men; the old philosophers were *not* all fools. They

* Sanscrit Texts, iv. 13 H. Muir, p. 344.

† The lecture on Arkism has been omitted in this edition.

could distinguish sense from nonsense as well as we — though not as *well* as we. Classical scholars have been tormented by the inconsistent and contradictory family-relations of the Greek and Roman gods, father, brother and son being mixed up together. Sanscrit scholars are equally at a loss to comprehend why Bramanas-pati should be called in one hymn of the Rig Veda ‘the father of the gods,’* and in another ‘the son of Tvasht, lord of all.’† Now I think that it is only in the theory of the development of the later monotheisms and polytheisms out of the older ancestral worships and fetich-worship of primeval times that we can find our explanation of these and similar mythological absurdities. To the ancient bard initiated in the Arkite mysteries they were no absurdities. What was fetich to the vulgar crowd outside was *history* and *poetry* to the priest within. And so it may become to us. But we must comprehend the *symbols*. Of these I will speak at large when next we meet, and you will permit me to devote an entire evening to them; for they cover the whole ground of human life and interpenetrate every department of natural history.

For this evening I have but one more word to add. I have spoken of three types of religious ideas: 1. Ancestral worship; 2. Fetich worship; 3. Polytheism and Monotheism.

IV. The highest type of the religious idea is Pantheism. It is the philosophic idea of God. It is the idea which science takes of the divine. Science, you know, is the knowledge of the logical understanding; not the instinctive sight of the pure reason—not the deep faith of the loving imagination. Science is essentially irreligious, that is, unworshipping. Science looks down upon things—not up to them. Science analyzes, dissects, discusses all things; God among the rest: or tries to do so; it is its vocation, its nature, its duty. Do not blame it. Do not feel a horror at it, as the Italians shuddered at good old Vasari, with his medical fez, loose gown, and scalpel. Vasari with his scalpel looked like a vampire hanging over that dead body. But there was no demoniac fury in the old man’s eyes; no—there was a holy zeal burning in them to

* Muir, p. 344. R. V. ii, 26. 3.

† R. V. ii. 23. 17.

discover the laws of the anatomy of the dead for the good of the living. Science is no vampire of the night, flapping its wings over our sleeping religion, soothing its slumbers, and sucking its blood. God forbid the thought. Every part of man must do its duty; and science is the work of man's logical understanding. Now, the investigation of God by man's understanding has always resulted in some theory of Pantheism.

Whether philosophers took Fetichism as their stand-point, or whether they took Ancestor-worship as their starting-point, they arrived at Pantheism. The worship of the father on earth develops itself into the worship of the father in heaven. Then the attributes of the personal god become generalized, refined, distributed, dissipated, and identified with the universe. When ancient sages came to believe in the absolute goodness, justice, love, and wisdom of deity, or providence, they fell into that peace which needed nothing, feared nothing, and therefore worshipped nothing. Nothing to blame, nothing to praise, the perfect whole became one great divinity. It was so in Magadha and Benares; it is so in Concord and Boston.

On the other hand, the worship of the fetich developed itself into the elemental worship of the ancients, and into the thunder- and war-providence worship of orthodox Christianity. If the progress of science has explained away the miracles, where is the miracle-maker? Distributed throughout his universe. All nature becomes a miracle. 'In him we live and move and have our being.'

But universal Pantheism is impossible. All the common instincts of man oppose his progress in that direction. Man also is a trinity: he is heart, imagination, understanding, in one. His God must therefore always be *personal* and *anthropomorphic* as well as *infinite*: personal—to be beloved; anthropomorphic—to be imagined; and infinite—to be confided in. The Incarnation of Jesus was a reaction of the human heart against the cold spaciousness of Pantheism. The Assumption of Jesus was a reaction of the imagination against the dark vagueness of Pantheism. So long as man feels himself a child he will climb up upon the knees of the Father who is in heaven; or nestle to the bosom of Abraham. So long as woman feels herself oppressed and afflicted she will idolize a well-defined divinity.

Joy and sorrow make common cause against the approach of Pantheism. Youth and women—three quarters of the human race—are idolaters by natural necessity. Let then the progress of science—the deductions of the logical understanding—clear away from men's eyes the errors of the past, and lead them into that liberty of spirit which is due to Christianity, 'the liberty wherewith Christ made his people free,'—it will be none the less a fact that 'the things of the Spirit are spiritually discerned.' There are things that science cannot grasp, some things that lie beyond the scope of logic; and it will be as true in every age as it was when the blessed Master took a little child and set him in the midst of them, that—'many things are hidden from the wise and prudent which are revealed unto babes.

LECTURE XI.

THE POSSIBLE IN DESTINY.

THERE are but two great schools of philosophy, the Optimist and the Pessimist.

The one teaches that the world was made to be a success—a distinguished success.

The other teaches that the world made itself, and is bound to be a failure—a flagrant and miserable failure.

Can these schools claim co-ordinate authority? Can such opposite philosophies be avouched of equal value? Impossible. The senate-chamber and the mad-house, a ball-room and a hospital-ward, could not inspire spectators with more contrary sentiments.

Who are they who compose these schools?

Pessimists are made of thinkers who are sick at heart—the discontented, the discouraged, and the disconsolate; hoppers who have lost hope in losing youth, fortune, ambition, affection, zest in work; dreamers of the absolute, who are tired of wandering blindly among truths undemonstrable, and vices irremediable; men who have lost themselves in scenes of misery not to be relieved by charity; men shipwrecked on a monotonous continent of ignorance, gloomy with fogs impenetrable to the rays of science; men of exceptional sensibilities; men of diseased, abnormal tenderness of spirit; men whose eyeballs are avenues for the approach of pain, whose hearts are swollen with excessive sympathies; men crushed by the load of the sins of an unredeemed world.

Can such as these be philosophers, teachers, prophets? These be no prophets. These have never heard the voice of one crying in the wilderness, "Make His paths straight before Him!"

Pessimism is the doctrine of the school of the lost prophets.

Its image and symbol is that gaunt figure perambulating the battlements of the doomed city, crying by day and by night: "Woe! Woe to Jerusalem!" and struck dead by the flying stone from the Roman engines, with the cry in his mouth: "Woe! Woe to myself!"

But the school of the Optimists is in the grove of beauty and in the portico of health; where the sun shines and the birds carol; whither the sounds of the anvil and the loom penetrate from the city, and the lowing of kine and bleat of flocks from the pasture and ploughed field.

Optimism weighs the sum of good against the sum of evil and believes in eternal providence; measures the misery of life and finds it in the proportion of the lees to the wine; estimates knowledge by its commonplace usefulness, and counts the virtues by the number of honest faces in a crowd.

Optimism is the practical prose side of philosophy, on which is written the legend of patience, contentment, hard work, and holy love for man and beast; life with many a merry passage for the most unfortunate, and death, the angel, the Christ, releaser of the spirits for a season in prison.

To both these opposing schools "The World" means man — mankind. The rest of the world is merely the *addenda*. Respecting man only are they opposed. They agree that the animal, vegetable, mineral, and physical phenomena of the universe are all right. Only man is badly treated, thinks the Pessimist. Man also is well arranged, thinks the Optimist. The Pessimist is inconsequent, the Optimist is logical. In the school of Pessimism one virtually sits in the seat of the scorner.

The destiny of all things is to attain the possible: for the world at large, the possible for it; for mankind, the possible for it; for man in particular, the possible for him.

How do we know this? We do not know it. We

only believe it, are sure of it, rely upon it. It is a reasonable conclusion from all we know, and from all we see going on around us.

Science is the definition of the possible. Science is knowledge of relationships determined by surrounding circumstances; of the knowledge of exhibitions of forces counteracting and directing each other within a bounded arena overlooked by spectators. Each force has its possibilities of scope, direction and intensity, resulting in established possibilities of form, color, size, quantities and qualities, all and singly predetermined and postdetermined by a common law.

Life is the struggle from within outward to accomplish all that is possible by and for the living thing. Destiny is its success.

Is there a destiny of failure? Certainly not. Failure is merely failure; a check from the surrounding success. What one gains another loses; what one loses another gains. Each attains its own possible, though not another's. There are eddies in all rivers. While the whole succeeds perfectly, parts succeed only partially. The current shoots ahead, the eddies lag; but the whole river reaches the sea, except what rises into the sky.

What is possible? Theologians say that all things are possible with God; but it is precisely with God that all is not possible; for God is the embodiment, the embodier of law; and law is another word for correlation and interlimitation. Law is both the assertion and denial of possibilities.

Two and two cannot make five; a body cannot be hard and soft, hot and cold, active and passive, acid and alkali at the same moment to its *vis-à-vis*. One cannot be before another, and yet behind it; which is only saying over again that order must reign, and eddies be in all rivers bounded by irregular shores. All creatures resemble rivers bounded by irregular shores; and the possible for them — and their destiny to accomplish the possible — is made up of the current and the eddies.

Some of the relationships which limit the possible

and predict destiny seem to be fixed and universal; while others are evidently slight, fleeting, and momentarily influential, or, as we call them, accidental. But it cannot be that even the vastest relationships of the universe are really fixed and universal. They only seem so to us babes of time and place. Therefore, while the destiny of man seems unchangeably good to the Optimist, and fixedly bad to the Pessimist, it is running a course, describing an orbit, unrolling a life of its own too large and long and too distant (in past and future) from our momentary stand-point of observation to be studied by us according to the ordinary canons of human investigation.

The destiny of every created thing is necessarily determined for it by the relations which exist between the qualities of its own constitution and the qualities which characterize created things around it. To know its destiny, we must know first what *it* is, and secondly what *they* are.

Take this crystal and drop it into the sea. What becomes of it? That will depend: 1, upon whether it be a crystal of quartz, or of feldspar, or of calcite, or of common salt; 2, upon where in the sea you drop it; on what shore; swept by what current; in the tropics or near the pole. In one case, it will resist solution and be covered up where you drop it, or be swept away to be deposited in the distance; in another case, it will be dissolved and mixed with the tides and circumnavigate the globe; enter into the tissues of seaweeds and corals, or become part of the tests of mollusks or bony fibre of fish.

A babe is born into the constituent mass of human society. What is to be its destiny? Say, first, what are its inherited qualities of soul and body; secondly, into what specially constituted zone of social life it is dropped, in what age of peace or war, in what class of luxury or sordid penury, in the city or in the fields, in the forest or in the desert, among the mountains or upon the plain, amid the snows and scanty daylight of the North which imprison men beneath their house-roofs, or where perpetual warmth and abundant fruit make life in the open air a free festival.

The key-note of modern science is given by this A-string of the violin, this dominant of existence: that every created thing, whether belonging to the spiritual or material worlds, is acted upon by and reacts upon its surroundings by virtue of its own nature and theirs. The result is its destiny. There is no escape. There is no intervention. Given the first two terms of the equation, the third follows.

But the terms are complicated, and the formulæ of resolution numerous. Substitution after substitution must be made by the calculator before the value of x appears. He is dealing with such a multitude of factors that his calculus must be both integral and differential. Long f 's multiply on the page. Perhaps the value of x never appears. That is not the fault of nature nor of science, but of the mathematician. A slip spoils his demonstration but has no effect upon the nature of things. Some unrecognized element in the problem must be sought for. The reagents react always in the same style, whether in the beaker-glass of Berzelius, or in the alembic of Paracelsus, or in the crucible of the old mountebank of Somerset County. Nature is no observer of persons. She cares not who is looking on and does her duty. This is the astonishing spectacle of destiny. Nature confers no D.D.'s, calls no man sage or saint, is blind to the existence of prophets, deaf to the groans of nations, smiles at the suggestions of her pupils, and frowns at the absolution of priests. There is no absolution. The universe is all solution and precipitation — re-solution and re-precipitation — without haste, without indecision, unerring, absolute, inevitable, normal, beautiful and divine.

In this despotism which the nature of things habitually, unceasingly, inexorably, both benignantly and pitilessly exercises over all created things the Pagan and the Pessimist see fate and the devil; the Christian and the Optimist see God's powerful mind and benevolent heart.

That is the essential difference between the two schools.

But there are Pessimists concealed in the school of

Optimism, pretenders, eclectics, who borrow from the text-books of its adversary to warp and debase their own profession. When the sons of God assemble to worship, Satans appear among them, point to the case of Job, and say: All then is *not* good, and all is *not* inevitable. Destiny may be thwarted by its own inventor; natural consequences may be averted by prayer, fasting, and alms; miracles may be wrought on special occasions; demons may be unchained from the Euphrates, and science may be rendered uncertain by divine or diabolic interposition.

No Christian can be a true Optimist who subscribes to the popular belief in hell. No Optimist can be a true philosopher who subscribes to the popular belief in miracles and prayer.

Yet hell is a part of the universe, miracles a part of its phenomena, and prayer the privilege of life.

These mysteries we must examine. They involve their own explanation in that of the destiny of mankind. But there is a natural order to every investigation; and to discover the destiny of man we must begin by distinguishing the whole from the parts, the individual from the race. We must also distinguish *destiny* from *destination*. We must learn the future from the past, and the past from the present. And we must bring to bear upon the subject of our research the light of every department of physical and mental science.

This is our task. It is a hard one. It has strained the intellectual sinews of the greatest thinkers. It has filled the libraries of the world with treatises. How can it be accomplished in a chapter or two?

LECTURE XII.

THE DESTINY OF MAN.

WHEN a great subject presents itself to the mind, it is as when the countless dove-clouds of Egypt take wing above the gunner's head. He knows not how to shoot.

A traveller's destination is his journey's end. The traveller's destiny comprises all his adventures by the way, and the success or failure of his hopes and wishes for that and every other journey he may ever make. The traveller's destiny rides on horseback outside his carriage door, like a lady's lover or a convict's guard or a general's aide-de-camp.

The Moirai sit by the housewife's hearth, and rock the baby's cradle. The three weird sisters, Clotho, Lachesis, and Atropos, spin, measure out, and clip at the appointed length the thread of its destined life. Born of the night, they explain not their work; servants of deity, they listen to no complaints; joint regents of land and sea, there is no escape from their dominion; the common wives of one husband, Necessity, their lips and the baby's lips are alike sealed.

And thus they sat at the cradle of the world.

Fate: *fatum est, sat sapientibus verbum*,—"the word has gone out, and shall not return. . . . So shall my word, going forth from my mouth, return not unto me void, but accomplish what I please, and prosper where I send it." It is decreed.

From this *φημί*, I say, Greeks made their *φήμη*, a voice from heaven, a prophecy, an oracle; and Latins their *fama* (fame), and their *fatum* (fate). For whatever

happens is first ordered, and then reported. History is but the echo of predestination. And the joys and sorrows of every man are but a drama played between the author behind the scenes and the audience before the footlights,—an anonymous author, and an audience indistinguishable for its multitudinous variety.

What then is fame, unless it be referred back to its author? And what worth hath human history except when recited by a soul inspired with a knowledge of the mind of God? To comprehend the destiny of a man requires a comprehension of his birth and education,—those hereditary traits which characterized the stock on which he budded, and the divine appointments of soil and climate in which he grew; the race to which he belonged; the century in which he lived; the wealth or poverty which lapped him; the winds which blew about him; the food he ate, the games he played, the books he read, the women he loved, the battles, great or small, with himself and with the world outside, which he fought, and how in each and all of them the victory perched. For out of all these destinies his destiny is compounded.

It is a mere trick of the irrational fancy to argue that a man's death is his destiny because when he dies he vanishes suddenly from view. Yes: from *our* view. But how is that event more significant of destiny than was his sudden appearance on the scene to our view? The sentiment which palpitates through society at the death of a man has as little share in the "Word of the Lord" as the applause or the hisses under cover of which an actor quits the stage. It is but one of his many adventures,—a part of his continuous destiny; and commonly as slight an index of his native character as it is an unimportant episode of his biography. The majority of human beings, like guests from a crowded ball-room, slip away unperceived.

Destiny for the individual is made up of unnoticed and unnoticeable articles. It streams through one's days and nights as diseased or healthy blood-globules succeed each other through one's veins. It tempers a man's palate, and nerves his arms. It looks out at him

from the eyes of his wife, and is reflected upon him in the behavior of his children. It furnishes or unfurnishes his homestead. It sows and reaps his fields. It sharpens or blunts the tools of his handicraft. It pervades his heart with passions, and his brain with ideas. It is the orbit in which he moves toward or from the central sun of his existence, drawing him inward to the warmer and more brilliant regions of the universe, or driving him forth into the outer darkness and cold of solitary spaces.

But the main point is, How does the man himself regard his own fate?

This also is part of his fate, and may be almost called the self-determining will of his fate. For, if he make himself his fate's friend, all will go well with it and him. But, if he conceives an aversion for it, if it disgusts him, enrages him, torments him; if he be afraid of it, as a burglar breaking into his chamber, or as a jailer feeding him on bread and water who may forget or withhold and leave him to starve, or as a tyrant whose nod can at any moment order him to execution, or as a treacherous guide who will probably lead him to self-destruction, or as a master who only wants him for a tool or a plaything or raw stuff to make something else out of — then he and it are lost together.

Men lump all fatalists and condemn them in a mass. But no difference can be more fundamental, more egregious, more operative, than the difference between fatalisms and — fatalisms. Buddhistic fatalism is grandiose, if absurd. Mohammedan fatalism is as commonplace as it is enervating. Christian fatalism is inspiring, stimulating, strengthening, and affectionate. Scientific fatalism is the soul of curiosity, the basis of reason, a whip to investigation, a sword to superstition; robs religion of its terrors, and prepares the whole apparatus of the future for man's salvation.

Kismet, murmurs the Turk, on the approach of the cholera or plague, and sits down to smoke his pipe. *Deo volente*, whispers the Christian, as he hurries to the hospital to save whom he can. And there he finds already in advance of him the man of science calmly

studying the *unalterable law* of disease, and the trained nurse instructed in a routine as intelligent and regular as that of the solar system, representing in her sacred person the mind, the heart, and the hand of God — all three in one — and she also a fatalist, knowing how to say of any patient: *saved!* or, *doomed!* but never *dammèd!*

The future destiny of mankind is for all to become fatalists in the Christian sense; to say, "If thou wilt not what I will, then, O Lord, I will what thou wilt; and so we shall still be agreed." As the order of the world becomes universally known it will become universally both acquiesced in and enjoyed, both obeyed and commanded. Learn to obey and thou shalt become ruler, says the Fate in Nature to the Fate in Man. Love me and I will serve thee, says this queen-lover to her lackey. Lift my veil reverently and take a thousand kisses, says this Isis to the priest. Fear the Lord and depart from evil, so shall thy days be long and prosperous on earth, rings through the air of all lands, and will so ring for a thousand years, until all shall know the Lord from the greatest even unto the least of the sons and daughters of Adam.

Nature then is fate, and natural religion is the destined religion of the future. Man's salvation is the product of obedience to the Col-Jehovah; this "voice which maketh the hinds to calve, and breaketh the cedars of Lebanon"; and the salvation of the race is to be an outcome of universal education in true science, where all shall know the Lord, and hearken diligently to his voice,—of a universal training of the brain, the affections, and the will of men of all races in all lands.

How is this to come about? Education, by the multiplication of teachers; sanctification, by the multiplication of saints; activity, by the multiplication of heroes. But teachers, saints, and heroes are themselves men and women.

Therefore, the prime and central fate of mankind is man himself. This is that God manifest in flesh. This is that Holy Ghost. This is the Jesus who is to be with people — his people, and all mankind are his

people — to the end of time; and, as he walks, his special followers walk behind him as students follow a demonstrator through the clinic; and the following grows as the ages elapse; and finally the whole mixed multitudes of the earth will be but one vast flock, led by the great, good Shepherd.

Meanwhile, every good soul is a *Jesus redivivus*, and has his or her own desert and Galilee, Tabor and Gethsemane. As he was a fate to millions, each of them becomes a fate to many. Science blunders if she limits her definition of fate *as habitat* by excluding man. The prime factor in the habitat of the bird is the abundance or scarcity of seed; of the fish, the temperature of the sea; of the buffalo and the horse, the luxuriance or drought of the prairie grass; but of man, the virtue or vice of surrounding people.

Every human being is therefore a main part of the fate of his or her fellow-creatures; and the destiny of a generation or of a race is determined by a plebiscite vote, just as is the result of an election held on democratic principles. The majority carries the day and holds the reins of government. But an aristocratic minority also exercises power, and more power in proportion to its size than the democratic majority. The proof of resident deity is, that, in the long run, the minority of goodness outweighs the majority of badness, so that the whole tendency of history is toward goodness. For, one man or woman, if wise and good, can affect the fate of society more than a score of men and women who are foolish and ill-behaved. Because nature — that is, fate — justifies the words and conduct of the wise openly in the sight of all, and as openly condemns folly by punishing it.

The destiny of mankind then, after all said, hangs and turns on the hinges of individual human conduct; on personal goodness, and the normal increase of the number of individuals who are personally good. Fanatics sigh for some impossible higher exhibition of individual goodness, some abnormal display of superhuman qualifications for a normal terrene life. The wise anticipate only an increase of human goodness in the gross;

a perfect sum total of earthly goodness; when none shall be better than the best who have already lived, but when all shall be good, and thus consent and concur to keep all good. Let the wise and good breed many children in their own likeness, and let the seed of the ungodly perish. So, and so only, shall the earth be filled with the glory of the Lord, as the waters fill the sea.

But what is goodness?

Anon! Anon! That requires illustrations, and we must pursue our train of thought a little further.

There is a distinction to be drawn between the physical and spiritual destinies of mankind, although they are so intimately interwoven that they must be realized together. For Manicheism is absurd, and the last traces of Asceticism are disappearing from the morning sky. We are followers of St. Paul, not of St. Anthony. The time comes when all fakirs and dervishes will be committed to houses of correction, with Italian organ-grinders and book-agents. The flesh is as good as it is beautiful, as good and as beautiful as the mind and soul, and much more easily saved. But the flesh exists only for the life that is in it, and beauty should be only the garb of goodness.

The physical destiny of each individual man, then, is to eat and live, to propagate children and die.

The physical destiny of mankind as a whole, may be stated in the same terms. It is at least true that the physical sciences predict with absolute confidence the coming of a time, however remote from the present age, when the sun will cease to shine, water to flow, grass to grow, and man to exist as a terrestrial animal; in which most remote and undatable catastrophe, however, historical and philanthropic philosophers can hardly be expected to interest themselves.

Nearer and dearer topics of meditation absorb us:— the growth of virtue in man and woman, the welfare of separate communities, the good ordering of local governments, the preservation or premature decay and possible extinction of races in detail, and the spring and spread of benignant influences, ameliorating the cares

and sorrows of men of every race, in every quarter of the globe.

It is, in fact, the possible enhancement of human virtue and human happiness which instigates the good to action, generates a true public spirit, makes reformers, martyrs, and philosophers merry, and indicates the character of that millennial age, the very name of which is to most minds the equivalent of human destiny.

But, in this sense, the destiny of a man and the destiny of mankind are terms which at first sight bear different and opposite meanings; although on further observation these meanings will be seen to resolve themselves into one and the same,—in materials, process of manufacture, and final use.

What, asks the Westminster Catechism, is the chief end of man?

Answer: The chief end of man is to glorify God and enjoy him forever.

In no case is this chief end of a man's existence on earth likely to be wholly and perfectly fulfilled; for individual perfection is hindered at the commencement of life by inherited defects of both material and construction; and throughout the whole course of life by defects of education and untoward circumstances.

The theological doctrine of original sin is plainly a fanciful portraiture of the hereditary disabilities under which each human being is ushered upon the stage of life—disabilities which are undeniable facts, and universally felt to be so.

The Oriental saying quoted by Jesus in his conversation with the young man of the Gospels: "Why callest thou me good? There is none good save God," is merely an exaggeration or forensic generalization of those imperfections, so numerous and so disabling, which every human being has been compelled to recognize in his own behavior, in childhood, in middle life, and in old age alike.

Yet "be ye perfect as your Father in heaven is perfect" must be a command based upon some sound and general condition of things in this world, and is in fact

fully justified by the near approach to perfect manhood, or likeness to the highest ideal of mankind, actually made by multitudes of men and women in every generation.

It is evidently as possible for a man or a woman to be perfectly good, as it is possible for a cow, under the most favorable circumstances, to fulfil all *her* righteousness, or for an exceptionally fine horse to run the mortal career of an absolutely typical or model horse, or for a monkey to be as complete and perfect a monkey as could be got up by any creator on the basis of such and such generic and specific characters.

But it is equally evident that the very perfection of a cow lies in her laziness, without which she would be lean and tough and milkless; that the perfection of a horse culminates in his stupidity, without which man would find it impossible to manage his fiery strength. The perfection of a monkey is its sinfulness, its insane passion for mischief, an *abandon* of curiosity tormenting to the surrounding animal world. That of the tiger is his cruelty and craft and treachery and deceit. That of a snake is its venom and ability to fascinate and swallow pitilessly birds and small quadrupeds; that of a fish, to gluttonize on shoals of its own offspring; that of the eagle, to rob ewes of their lambs and pick out their eyes. These abilities and habitudes are the forms which divine perfection puts on in such creatures and also in man, so long as man remains a citizen of the animal commonwealth, and also afterward; but less and less as he migrates toward and finally settles in the new world of super-animal civility. And at last the substitution of another set of qualities changes the exhibition of God in flesh to a more glorious fashion.

“Be ye perfect as your Father in heaven is perfect,” is then a phrase carrying two very different meanings, corresponding to the two kinds of human goodness — the goodness of man as a spirited animal and the goodness of man as an embodied spirit. The first kind of goodness being very general in the world, and the last kind of goodness being in Jesus’ day very rare — and still rare enough for dogmatic purposes in our own

times — Jesus commanded and prophesied *it*, not the other kind.

The philosopher of the nineteenth century expects a millennium illustrated by both kinds of human perfection; not in rare cases and classes, and favored individuals and sects, but universally. All men and women shall in course of ages become as good, as perfect as horses, cows, monkeys, tigers and snakes are, and also as good, as perfect as Jesus was, and also as good, as perfect, in their kind, as God the Father is in his infinite, comprehensible, and unmistakable way.

In other words, the lower and the higher natures of all mankind — physique and intellect, passions and aspirations — shall both of them be cultivated to perfection, universally, under every possible variety of circumstance, stirpal and personal, tribal, national, communal, and familiar. The breeding of man will become as high an art as the breeding of plants or cattle. And this art must apply itself with the same conscientious closeness to the various utilities of man-kind as to the various utilities of cattle-kind and plant-kind. Beggarly science that, to make all men alike and all women alike, in making them perfect as God is perfect! The stars must differ still in glory after the different species of glow-worms have become stars. The glory of each will be, that it will shine its own kind of light. Creeds cannot manage this sort of thing. No technical doctrine of goodness and badness can cast so much as a rushlight along so vast a vista as that of the future — mankind perfectly arranged according to all the human qualities and all their uses; each quality being good for its appropriate uses, and each use being good in its appropriate circumstances, and bad only when out of time and tune in the orchestra. Some men are born fifes and D flutes, and others are born diapason pipes and ophicleides, and others clanging cymbals or kettle-drums, and some delicate violins or superb 'cellos, or martial bugles and cornets, or soul-ravishing French horns; and some are the voices of angels who have come unperceived to listen to the concert, and stayed to partake in it.

By all these are the Composer's thoughts turned into music. But in each reside possibilities of harmony and discord; and these possibilities realize themselves in what we call human goodness and human badness. If the music call for harmony, then discord is bad. But if the music call for discord, then harmony becomes bad. Good and evil change places. And this is the key to the right interpretation of human history. And this is also the test of reason in any system of ethics; of divinity in any religious creed. It certainly dominates the true logic of human depravity; for the question is not, Are all men sinners? but, Is all sin sin?

To discuss sin, one must begin with original sin. All sin is in fact original, just as all virtue is original, since both issue like wind from the pipes of the organ, man; for the wind has no music when it is blown into the pipes, but the reed in the pipe originates the music. Each of its own kind, true or false, good or bad, according as it is made and tuned, and not otherwise.

The doctrine of original sin might be argued for from small to large, from the defects in every baby born to the brutality of savage populations and the prevalent vices of cities. But it is demonstrated by those results of archæological research which have been described in Lecture VI. on the early Social Life of Man:—no age of gold, no Adamic Eden; cave-dwellers of the Stone ages, oscillating to and fro in front of the polar ice; invaded, driven back, extinguished or absorbed by succeeding races of equally barbarous metal-workers of the bronze and iron ages; followed by civilizations abortive, cultivating superstitions hideous; from all which arose, in the last times, true learning and genuine humanity.

No man has been good, no race has not deserved the name of bad. Yet God was at first and afterward and all the time good, and his nature sweet and true. For man, all God's plans and performances were only tentative and preparatory, but how prophetic!

Good! There we have a Joseph's coat of many colors.

Good! All things have been always good and right.

For mankind is a thing. And every man is a thing.

What, then, must we mean by good?

In the eye of science, philosophy and Optimism, the *arranged* is good, the *disarranged* is bad. Filth is matter out of place. Sin is intemperance, disobedience, irrationality, inconsistency, imperfection, incompleteness.

Nothing can be teleologically good until it is finished. Nothing can be scientifically bad, if it be going on unto completion. To move is to live; and life has the seed of the perfect in it, although it doth not yet appear what it shall be.

In the last analysis, *the bad* turns out to be *the inconvenient*. But it is quite convenient to itself and to its generating element. For all else, it is inconvenient, and therefore bad. The young wolf is good to the old wolf, but bad to the ewe and its lamb. Weeds are beneficent to the waste land, to the rivers that drain their reservoir of rain-water, to the soil they protect from erosion, to the birds they feed with seeds, whose nests they supply with timber, to the botanist whose heart they rejoice; but the farmer sees in them a curse for Adam's sin. "Thorns and briars shall it produce, and in the sweat of thy brow shalt thou eat bread" he murmurs, as he pulls them up and crushes them under stones, as evil and only evil, and that continually.

Can we say less of the Bedouin, "that wicked race" of Egyptian literature, the Kurd, the Miaotze, or the red Indian? Have not barbarians been thorns in the side of every local civilization? Yet hold not all barbarous tribes from Nature a freehold right to habitation, and Nature's passport of citizenship? Is not Nature's ægis of protection thrown over them as effectively as over classic Greece and Rome? Where are Babylon and Memphis now? Were they good because they were seats of learning and centres of art? Where now is that Jerusalem, the Holy City, the delight of the whole earth?

If, then, Nature lovingly protects the bad, God must love the bad; or—man is mistaken as to what is bad.

Both are true. God loves and cherishes as good

much that man designates and denominates the bad. Jesus taught this in parables, and science explains his parables.

When Jesus turned to the woman and said unto her, "Go in peace, thy sins are forgiven thee: sin no more" he expressed the central truth of human wisdom — that the good is the convenient, and the bad the inconvenient. The tree of life and the tree of the knowledge of good and evil grow side by side. In the vernacular, the good is *proper* and the evil *improper*. Proper to what? Proper to its own time and circumstances; that is, *convenient*. To kill a tiger is heroic, to kill a monkey is shameful, to kill a slave detestable. No words can express our horror of the thumbscrew and faggot; but we have only terms of admiration for the dentist's tools and the moxa. And yet good men have been inquisitors, sportsmen, members of Vigilance Committees. The question is, Did they know what they were doing? The last words of Jesus were, "Father, forgive them, for they know not what they do." Who? Even they who howled, "Away with this fellow from the earth." Was it because he was so supremely good? No: it was because he could not look upon them as so very bad. They were, in fact, men who loved their wives, their children and their country,—good citizens, as the times went, but semi-civilized. They had not yet attained. Their character was inchoate, foetal; in a stage of the process of formation at which they were but half-made men. Their destiny was in mid-career.

What is true then of animals in natural history, and of savages and criminals in human history, must be true also of the evil-minded and evil-doers with whom we live. They are not bad in the eyes of God and of Nature in the same sense in which they seem so bad to us. We are easily deceived by our natural love of what is to us *convenient*. The shingle-stealer has certainly more right to the timber of the forest than we have; for he works it for the convenience of society, and does no harm to any one. Yet we brand him as a thief, and shut him up from the light of the sun like a wild beast, precisely as if he had starved his family.

Whatever traverses our personal convenience, that is bad. This is the shibboleth.

Let us take another view. Let us suppose that the State owned the forest, and that the shingle-cutter were a citizen. Is he changed? Is his conduct altered? Does he support his family otherwise than as before? Is he less or more diligent, enduring, self-sacrificing, honest to the store-keeper, attentive to sick neighbors? Is he less or more passionate, sober, envious, truthful, chaste, or profane? The situation is unchanged. The man is unchanged. His deeds are the same: his thoughts, his words, his behavior, are just what they were before. Yet, strange to say, he is now no longer a thief, but an honest fellow and good citizen.

What, then, has wrought this result? Something that has happened hundreds of miles away, at Harrisburg, or in Philadelphia. An idea has slipped from men's minds and been replaced by another idea.

Another case: A poor man in a city steals a loaf of bread, because he has had no work and his children are crying for something to eat. He is a thief, a beggar, a miscreant. He is arrested, tried, convicted, and sent to jail.*

But suppose a change of ideas in the minds of the people of that city to take place. Instead of the idea that the thief is a public enemy, suppose the idea that he is the public's ward. Instead of the idea that the con-

* Tuesday, Feb. 22, 1881, the coroner was informed of a dead body in a house near Milwaukee in Wisconsin. He found a mother ill on the ninth day after her confinement. The child had been dead two days. Four children under ten years of age, with herself, had had no food for forty-eight hours, except scrapings from an old swill-barrel, which had formerly been used in carrying slops from a distillery. Ernst Lutz, the father, was in jail, awaiting trial for stealing an old harness. On the previous day, he had finished a term of sixty days, at the house of correction for a petty offence, and was arrested again as he left the jail.

The blind philanthropy of modern ideas refused to whip for the "petty offence," and death and starvation was its reward. Thrust the inconvenient by all means out of sight for sixty days, and again for sixty days. But the baby will die, and the mother and children starve. No matter. Thrust the inconvenient out of sight,—it is intolerable, it is bad. Bury it alive as much as possible!

venience of society means that of the shrewd, active, and well-to-do political, mercantile, and artisan classes, suppose the idea to become prevalent that the convenience of society means the regulated welfare of old and young, rich and poor, sick and well, shrewd and simple, ill and well born, ill and well educated, each and all alike. Suppose that out of this idea some admirable municipal organization of property and labor should be made to include some cunning organization of the feebler and more vicious classes of society for strengthening and bettering them. Suppose that the same philanthropy should be applied to vice and want that is, in some good degree, already applied to disease and insanity. In a word, and for the sake of specimen, suppose that there were a municipal store-house to which the man who stole that loaf might betake himself,—go and take his loaf of bread, not from the private baker but from the public bakery, and pay for it by presenting a due-bill ticket redeemable by one or more hours of labor for the public convenience; by sweeping the streets, carting refuse, cleaning sewers, building levees and wharves, dredging channels, carrying bricks for public buildings, keeping parks in order, serving as supernumerary messenger, police, hospital servant, etc. until he could earn his bread in his usual, regular and private way. Would he then be a thief? Yet the act of carrying off the bread would be the same, and the use of it would be the same. The man would be unchanged, and his relations to society would be unchanged.

The change would be in our ideas of the moral quality of one of his million acts. He was a bad man because he committed a bad act. The act is no longer bad, therefore the man is no longer a bad man. Society retaining its first idea was inconvenienced, and clapped him in jail. Society having got another idea is not inconvenienced, and calls him a good and useful citizen.

Let us look at all this a little closer, for it lies at the bottom of all discussions upon the Destiny of Man.

To return to the shingle-cutter. *Does he believe that*

he is a thief? By no means. He breathes the air and commits no theft, for God gives the atmosphere to all. He drinks the water and commits no theft, for God distils rain from the sea for the life of all. He cuts the forest and thinks that he commits no theft, for he sees that God has spread it out over the earth; and why not for the good of all? The tree he cuts would otherwise rot and fall and disappear, and be of use to none. He utilizes it for some farmer's roof in the low country. Is it any one man's special property? Whose? Who made it? Has any one planted or watered it? No one but God. Then God alone owns it, and all that God owns he gives to mankind,—to the man who will make good use of it. It is his by first right. The air to him who breathes it, the water to him who drinks it, the tree to him who cuts it, the soil to him who farms it.

In all past ages these common possessions of the race have been claimed in specialty by the rapacious, the powerful, and the cunning; seized upon by force of arms, and held by acts of legislation. But legislation based on barbarous or semi-civilized ideas can neither certify truths nor qualify rights. And the shingle-cutter feels this in his heart of hearts, and acts accordingly. The same inward inspiration has made the slave a thief in every age and clime.

Does the shingle-cutter appropriate a tree upon his neighbor's farm? He would scorn the act. Why? Because he feels that every tree on a farm belongs actually, truly and of right reason, to the farmer who works that farm; to touch it would be theft, and he is no thief. If he felt that the claim of ownership of a tree in the unbroken forest by a man in Philadelphia who had never set his foot upon it or lifted his finger to use it, was a genuine, just and reasonable claim, he would respect it also. He cannot enforce his denial of the justness of the claim in the face of law courts and prisons, backed by the armed force of the State, wielded by the man in Philadelphia; but, denying it all the same, he evades it all the same, and repudiates the charge of theft against himself.

There are two kinds of theft then: theft which the

mind and heart of every man recognizes to be theft:—the robbery or spoliation by one man of that which another really and truly owns, according to the laws of God and nature;—and theft constructive: the appropriation by one man of what he rightly or wrongly believes not truly owned by others, although claimed by one or more.

Against the first kind of theft the thunders of Sinai rolled, and all society wars; it is the destiny of man to abolish it.

Against the second kind of theft the statute-books of Christendom are written, and the overwhelming forces of the organized communities of the nineteenth century wage cruel and protracted warfare. It is the destiny of man to abolish this kind of theft also, but not in consequence of that warfare; still less by the petty successes gained in that campaign.

All crime is theft. All the crimes and vices of mankind resolve themselves into theft. The whole moral law was uttered against one sin, theft. God recognizes but one class of criminals among his creatures,—the robber.

The enemy of God and nature is that thing, that creature, that man who disturbs good order by living not of his own and in his own, but in and of and from and by another's. To give is the privilege; to steal is the crime.

Murder is the theft of another's life; and the worst of thefts, because repentance is vain and restitution impossible.

Adultery is the theft of another's wife; and the next worst of crimes, because it robs the heart and invades and destroys the very nucleus of civilization, the family.

Fornication is theft; for it robs the woman of her honor, and her relatives of a part of their standing in society.

Slander and false-witnessing are accursed, because they are raids upon society; burglary and petty larceny in the street and in the home; filching and stealing the most personal of all property, a man's good charac-

ter and standing before the community; on the loss of which he had better die, than live compassionated by his friends, mistrusted by his companions, feared by the feeble and despised by the strong.

Lying is theft. It robs men of what they have a right to know. It forces upon their acceptance false coin with which to carry on the business of life, causing them to fail of the success to which they are entitled.

Blasphemy and obscenity are theft. They rob men of the pure air which they have a right to breathe, and of the honest thoughts which they have a right to enjoy.

Envy and covetousness are theft essential; theft pure and simple; theft in the seed and in the bud; the very soul and force of all the outward forms of rapine and murder which the laws of human society are invented and enforced to suppress.

But observe—and observe it well, for this is the kernel in the nut—murder is *not* theft, if the murdered man forfeits his right to live; nor adultery, if the husband's right of ownership be bad; nor fornication, if the man and woman wholly own themselves, as on a desert island; nor slander and false-witness, if the libel be a truth; nor lying, if the listener have no right to know; nor blasphemy and obscenity, if they be so only according to the superstition and impure interpretation of the judges; nor envy and covetousness, if they be directed to what is common property, with enough for all and plenty to spare.

In other words, these terrible names for real crimes are not to be applied by mistake, by popular clamor, by superstition, by fear, favor and unrighteous legislation, by selfish interest, by illogical inference and narrow prejudice. Alas, the crimes are real and too prevalent. The names are justly bestowed—but not always. How we can guard the virtues from having forced upon them this nomenclature of the vices is *the* question of the future. And how we can spread the knowledge of the true order of things is the true destiny of man.

The bigot calls the pure and holy testimony of the Quaker and the Moravian blasphemy. For, says he, it

robs God of his glory, the Church of her lambs, and the priesthood of its power to loose and bind.

The Mormon, or the Turk, denounces the wife (one of many) who leaves his harem and marries another man, as an adulteress, and shoots or stabs her new husband as a seducer.

Society brands as a harlot the innocent and guileless girl who yields to a false promise of marriage; hunts her to distraction and death, and rewards her betrayer with the presidency of a railroad or insurance company, or sends him to Congress to make laws for the good of the land and the hastening of the Millennium.

Society would utter a cry of horror, and punish if it dared with confiscation and imprisonment the author of a book unveiling the debaucheries of good society; while it proffers all the resources of the press and of the post to the publication and transportation of the vilest writings of Paul de Kock or Balzac, while it persecutes in a hundred ways Anthony Comstock, the only man in the largest city of the Union who devotes his life to the suppression of obscenity.

And what else can we make out of that legal rule, "The greater the truth the greater the libel," but a government device to protect fraud and vice by giving the vice-name of slander to the virtue of uttering wholesome truth for the purpose of guarding honest people against rogues? To rob a rogue of his character is no robbery; it is unmasking the wolf in the sheep-fold.

While all crimes are merely species of one genus,—theft—theft is only theft against a just ownership. The acknowledged ownerships of savage society are mostly genuine; the legislative ownerships of civilized communities are many of them equally genuine and allowed by all; but many of them are fictitious, enacted by the privileged for special classes, and are secretly disowned and rebelled against by the multitude.

Hence the majority of committed crimes.

Hence the periodical rebellions and insurrections of the many against the few.

Hence elaborate codes of arbitrary laws, the education of professional lawyers, the enrolment of standing

armies, the elevation of gibbets and multiplication of prisons, the precipitate of a pariah class, the wanderings of a host of tramps, infinite land litigation, the ruin of families on the foreclosure of mortgages, the ever-increasing population of alms-houses, the organization of labor against capital, and the spread of socialistic doctrines all based on one idea — *La propriété, c'est le vol.*

Has it then come to this? Is the destiny of man to be a *bouleversement* of the divine law of property, on which all true civilization has been, is now, and must forever continue to be based?

Property theft! Nay, the theft of property is theft. And, if mankind have any one definite destiny it must be to demonstrate this in theory, and to organize in all parts of the habitable world the right applications of this theory to the practices of life.

What men own and what they do not and cannot own; what women own and do not own; what children own and how far their rights of property are merged in or limited by the property of their parents; what society owns, to the extinction of individual rights, and what it only claims to own, without any right but that of might; what are the periods, qualities, quantities and guarantees of all these species of propriety; and what are the methods by which their public statement and record, and their private and popular recognition can be formulated, so that misunderstanding and strife may cease — these are the highest themes of the philosophy of the future.

These have always been and are now the main topics of human conversation.

But desultory conversation, the gossip of neighbors, the objurgation of litigants, the scandalous cross-examinations of witnesses, special pleadings at the bar, and literal precedents of the bench, newspaper editorials, partisan political pamphlets, discussions at board meetings, riotous speeches at the polls, fourth of July orations, inaugural gubernatorial and presidential addresses, legislative debates, and sectarian sermons — all these ordinary and universally abundant means for ven-

tilating the thoughts and feelings of the human race have failed hitherto, and fail habitually to settle the rights of human property.

Because the foundation itself must be deep and permanent on which a stable edifice is to be erected; and no such sound and natural theory of human rights has been agreed upon as will safely bear the vast and composite edifice in which the laws of practical right and wrong are hereafter to be administered.

Church and State, monarchies and republics, alike, continue to take for granted the revelations and inspirations of the past. God owns absolutely everything and man nothing. The man everything and the wife and child nothing — but of his free gift. The State has eminent domain, and every individual must buy of the State. The Church has a monopoly of truth, and the individual is a beggar at the church-door. The right to amass wealth is unlimited, and the inept in body, mind or heart is a tolerated or beneficed client — nothing more.

How, upon these cyclopean foundation walls, laid in the centuries gone by, can the New Jerusalem be built and all the sons and daughters of God be gathered into it?

New foundations can Science only lay:—science, that revelation of God in nature to and for the whole human race, and not to any individual human being. Social order will be a gradual experimental, analytical and synthetic discovery, like astronomical order, or geological order, or any other generalization of physical phenomena. It will not be invented, but found out. It will grow slowly, secretly and openly, and spread this way and that. By degrees rights and wrongs will reveal themselves. By degrees men will know what they own and what they do not. Then there will be justice, and peace on earth and good-will among men.

LECTURE XIII.

THE PHYSICAL DESTINY OF THE RACE.

THE destiny of mankind depends in a physical sense on the permanence of its habitation; upon the continuance of favorable circumstances in air, land and water; upon the maintenance of a proper temperature; upon geological changes which may happen to alter the sea-level and multiply or diminish the number and size of lakes; upon the copiousness of harvests in fertile parts, the possible reclamation of deserts, the preservation of forests, the colonization of plants and animals and the culture of useful fish; upon the inexhaustibility of mineral deposits; upon the practice of medicine and the knowledge of hygiene; upon the adjustment of property and the use of accumulated wealth; upon the equal distribution of handicrafts, the applications of machinery, the multiplication of the lines of commerce, and the prevalence of national friendship; upon the simplification of language, the extension of primary education, the elevation of the intellect of the whole race, the number of men of genius, and the adoption of pure religion.

The *Astronomical* future of our globe will depend upon the results of actions taking place in the Sun. The earth will hardly be affected by the planets much more than it is now. We know of no causes likely to alter their masses or orbits. Their distances from us will remain constant, and their heat, light and attraction be alike unimportant. But indirectly they will continue to influence the earth by their effects upon the Sun.

It is now understood that when the larger planets collect upon one side of the Sun they produce a marked change in the number and size of its spots, although the precise nature or mode of operation eludes inquiry. It has also become an accepted fact that the maxima and minima of sun-spot area agree with the maxima and minima of magnetic force upon the earth, of auroral displays, of mean temperature, of rainfall; probably of plenty and famine; and possibly of epidemic disease.*

A connection between the sun-spot cycle of eleven years and the cyclones of the Indian Ocean has been attempted by Mr. Meldrum of the Mauritius Observatory, while the Indian meteorologists Archibald, Blandford, Broun, the two Chambers, Eliot and Hill have sought in the sun-spot period some explanation for the droughts and famines of that densely populated peninsula. Frederick Chambers attributed the high barometer and deficient rainfall of 1877 to less sun-radiation not piling the atmosphere at the equator. Dr. Hunter connected the sun-spots with the famines through the barometer, thus:—

1. Variations of the solar-spotted area are succeeded *months afterwards* by corresponding abnormal barometric variations, a *high barometer* corresponding to a *minimum of sun spots*.

2. Famines follow in the wake of curves of high barometric pressure.

The approach of famines may probably be foreseen by the immediate publication of continuous observations of the state of the sun's face, and by immediate publication of barometric observations in high and low latitudes. This great work is already becoming not only national, but international, and must needs become a complete and perfect system all over the globe.†

* See Baxendell's researches in 1878-9, Manchester.

† Meldrum's observations show by observations at thirty-seven stations in his district that the rainfall is greater about times of maximum sun-spot frequency. Meldrum's and Poëy's observations seem to show the same of cyclonic storms both in the Indian Ocean and Carribean Sea. Balfour Stewart has recently seen reason to believe that sun-spot inequalities of short duration are fol-

The *Meteorological* future of our globe could be safely predicted were its past records at our command in anything like a complete and intelligible shape. But these records are, on the contrary, signally deficient and singularly obscure.

We have but two criteria to judge of the climate of prehistoric ages: 1. the former extent of ice- and snow-fields; and 2. the former healthy existence of animals and plants in regions which they no longer inhabit.

When Scandinavia was buried under a solid and continuous sheet of ice as Greenland is for the most part now, and icebergs drifted over an arctic sea outspread upon the plain of Northern and Eastern Germany, and dropped their blocks of granite as far south as Leipzig in Saxony*; when all Canada was similarly covered, and all New England, with ice so thick that its sloping surface stood above the highlands of southern New York and north-western Pennsylvania, twenty-five hundred feet above the sea, filling the great basin in which lakes Ontario, Erie, and Huron now lie, and projecting glaciers through low places in Ohio and Indiana as far southward as the Ohio river, and in one place (in western Kentucky) even beyond that river; leaving on its retreat a whole zone of the continent covered with fragments, sand, and mud; reconstructing the surface topography; and dotting our maps with innumerable small lakes and ponds, caught in these Northern Drift

lowed by corresponding inequalities in the diurnal temperature range of Toronto in Canada, in such a way that a large amount of sun-spots slightly precedes a large temperature range. Sabine long ago showed that the diurnal oscillations of the magnetic needle are greatest about times of maximum sun-spots, lagging behind them, so that "magnetic weather" also travels from west to east. With all this agree the spectroscopic observations of Lockyer and others and the actinometric results of J. H. Hennessey in India. The question (raised by Professor Stokes), if a greater amount of solar spots denotes a greater solar activity, seems in a fair way of being answered affirmatively. But the question of true periodicity is not well answered yet; there may be variability with true periodicity. (See B. Stewart in *Nature*, p. 237, 1881.)

*The most recent memoir on the subject however extends the ice sheet itself as far south as Leipsig.

deposits — the climate of the globe must certainly have been of a very different temper from that of our day.

If the Scandinavian ice-age were different from the Canadian ice-age in point of time, we might ascribe its phenomena to largely acting local causes, not affecting the globe as a whole. But it is difficult to find marks of such a distinction. Most geologists believe that Canada and Scandinavia, Scotland and the north of England and Wales, lay buried at one time beneath a sheet of moving ice. Siberia shows no distinct traces of this ice, and was probably left bare. But the Ural chain was covered; and modern glaciers in the Altai range present themselves as remnants of a similar ice-sheet covering Mongolia and western China. The Tien-shan, the Pamian plateau, and the northern Himalayas probably escaped for want of moisture, as they do now, in spite of their great elevation. But the Alps and the Pyrenees had their covering of ice, the northern edge of which flowed down over Switzerland, and banked itself against the Jura Mountains; while its southern edge invaded Piedmont and Lombardy nearly to Turin and Milan, and beyond Verona. Probably all Languedoc and Provence were covered for the short time during which the outspread was at its maximum; for Desor has recently discovered moraines just back of Nice; and reindeer, polar bears, gluttons, and hairy mammoths prowled and browsed in southern France.

The recent survey of British Columbia has shown a similar ice-spread over the two mountain ranges and intermediate valley-land of the Pacific coast and Vancouver's Island; but Prof. Whitney's last report on California shows the glaciers of the Sierra Nevada as always local and unconnected.

The cause of this prevalence of ice at one time in the northern hemisphere is still disputed. Glacial ice is made out of snow. Snow falls only along the paths taken by winds saturated with moisture evaporated from the sea surface. In the bitterly cold winter climate of Minnesota and British Columbia, swept by dry air, the snow-fall is so light that the Canada Pacific railway will be easily worked. To get into the heavy

snow belt we must go south toward Colorado and New Mexico. The balance between evaporation and frost in the Glacial Age must have turned in favor of the former, whether the real mean temperature of the globe was higher or lower than now. There must have been extra evaporation, a more constantly saturated atmosphere, whether the lower strata of the air were extra cold or not.

Did this excess of evaporation come from a larger sea-surface? Certainly not in the case of Europe; nor in the case of British Columbia; nor have we any certain evidence of the submergence of the Mississippi basin at that time.

Was the excess of evaporation caused by a temporary access of solar energy; operating upon the oceanic areas as we know them, in the southern and equatorial regions, and saturating the northern frigid zone?

The sentiment of geologists, physicists, and palæontologists, in favor of an extra cold mean climate of the northern hemisphere in the ice-age is pronounced. But there is danger of reasoning in a circle. The remains of the reindeer in southern France, of the walrus in South Carolina, are good evidence of an arctic climate at the edges of the ice-covered areas, but not of a general low mean temperature of the arctic zone as a whole.

If the Glacial Age, however, was really one of universal arctic cold, it may have been also one of universal antarctic heat. When Canada was buried under ice, the now concealed antarctic continent may have been a land of the fig and the grape, crowded with animal life.

This is the picture drawn by Mr. Croll, the inventor of an astronomical cause for the phenomenon under review. The ellipticity of the earth's orbit not being constant, there recur periodic times when the earth approaches to within eighty millions of miles, and recedes to one hundred and ten millions of miles from the sun. When at such a time of maximum orbital elongation, the nutation of the earth's axis turns the north pole away from the sun at the apogee, many extra cold

winters and extra hot summers must follow each other in succession. Those who support Mr. Croll's hypothesis calculate on an accumulation then of the annual winter's cold in excess of the accumulation of annual summer's heat, for covering the north slowly with ice.

Mr. Alfred Russel Wallace in his "Island Life" adopts this view in a modified form, but lays more stress upon concurrent changes of land- and sea-areas. Others see greater difficulties in the way of accepting it arising from a fact which presses most upon the attention of geologists: viz. the absence of geological evidence of recurring glacial ages. Recently indeed pre-Cambrian glaciation has been noticed in Scotland; and there are marks of glaciation of a Permian age. But other recurrences have not been noticed; whereas at every 21,000 years of the history of the globe the phenomenon should have left its traces.

Whatever may have been the cause of this state of things in the last ice age several thousand years have passed (some would have it 10,000, others 200,000) without the repetition of any such flagrant departure from the order of sunlight and solar heat which Earth enjoys; and many thousand more will probably roll by without disturbance to the human race from this capital but obscurely comprehended cause. Whatever destiny the race is to have will be accomplished in full before the improved spectroscopes and thermopiles of the future shall have detected, much less measured, a secular diminution of favor in that royal countenance by the grace of which all earthly animated things continue to live and move and have their beginning.

The meteorological future of man's dwelling-place wears no sinister aspect when regarded from the standpoint of those who ascribe the glacial age to alterations in the proportion or relative positions of the areas of land and sea. These areas have remained practically unchanged since long before the dawn of monumental human history; and that means at least ten thousand years. Therefore, for ten thousand years to come the mountains, plains, great rivers, and lines of sea-coast in all countries, and the shoals and islands of the sea, will

probably continue to be represented in the charts of the distant future as they are on our best maps now; and mankind will continue to work out the problem of its destiny on virtually the same slate which is already so covered with demonstrations of the past.

Considering then the sun as fixed in its resolution to shine and warm, the present continents as fixed in their places, forms, and altitudes, and the water-basins of the globe as changeless and inexhaustible resources for the ever shifting and sliding, ascending and descending atmosphere, there is no fear that the early or the later rains shall fail for the husbandman, that the great trades shall cease to blow for the sailor, or that the sunrise and sunset shall ever be less inspiring to the lover of the beautiful. Deserts will remain desert, and fertile regions continue to be populated; mountains will always bear forests, and great cities continue to be built along the sea.

But storms will also always be in order, and local hurricanes and extraordinary waterfalls from the sky and uncommon wide-spread frosts or heats, causing bodily distress and loss of wealth to individuals, or to whole communities; inundations and avalanches in mountain valleys, along great rivers, and upon the sea-coast; tidal waves generated by earthquakes; all dangerous to the life and happiness of man.

But as man has been a helpless prey to these calamitous gesticulations of his mother earth in past times because ignorant of their cause and meaning, of the times to expect and the safeguards to oppose to them, in future he will learn the premonitions of their approach, and fearlessly provide for his own safety. This is the promise of the new science of Meteorology.

Since William Blasius, after a study of the West Cambridge tornado in 1849, proposed to Joseph Henry in 1851 the plan of a meteorological Signal Service system, and Lorin Blodget made the first trial of one by telegraph for two months in 1852,* and the Smithsonian Institution actually accomplished it by distributing

* Proc. Am. Phil. Soc. 1876, p. 205.

thermometers, barometers, anemometers and rain-gauges to volunteer observers at various points between the Mississippi and the seaboard, first France, then England, then the United States have established government Bureaus of Meteorology. Belgium, Switzerland, Italy, Germany, Austria and Russia have imitated their example; and now Sweden is preparing to extend the area of observation by erecting one observatory at the head of the Gulf of Bothnia, and another in a deserted refuge on Spitzbergen. Three times a day the weather of all Europe and North America is telegraphed to central observatories and the data charted and redistributed by mail. Storm signals are raised at all points of coming danger to shipping; news of any sudden rise in rivers is telegraphed to points below, in advance of the descending freshet. Every cold wave that crosses the Rocky Mountains is heralded before it can reach Chicago and St. Louis, and its course considered and reported, so that the people of Canada and the Eastern States may be prepared; or if it be moving southward, the planters of the south may protect their crops. When the tremendous meteor has left our coast, its time of probable arrival in Great Britain is telegraphed to Liverpool, to warn all colliers and fishing boats of its coming; and every step of its subsequent career is noted and recorded until lost sight of beyond the Euxine on its way to the highlands of Persia.

From Jamaica to Ottawa, from San Francisco to Sydney, from Lisbon and Algiers to within 208 of the north pole, and to the Indian Ocean, a thousand trained observers report three times a day how the winds are blowing and whether the sun shines, the rain falls or the snow drifts; the height of the air above them, and the heat of the air around them.

A century hence—the United States territory sustaining a population of 200,000,000 souls,—Mexico having received an overflow of 50,000,000 English-speaking whites,—the South American savannahs illustrated by half a dozen commonwealths as large and as civilized as any of our Northern States,—Cape colonists occupying southern Africa northward to the Zambezi,

— Egypt and Mesopotamia regenerated and refurnished by the energy of Franks with wealthy cities connected by railways with all the world,— the Ottoman empire under Greek and Austrian rule,— the Russian steppes illuminated by the sciences and enriched by the arts,— India irrigated and China reformed,— a century hence, the thousand trained observers of atmospheric physics will have become a hundred thousand, and from innumerable localities, equally distributed over land and sea, hourly bulletins will be concentrated, to be reflected through the universal press upon the whole human race;— bulletins not merely of the movements of the surface air, but of the upper currents of the atmosphere; for every favorable Alpine summit will be crowned with an observatory, and trial balloons will be regularly set adrift from the plains.

Then too will be detected and charted those invisible streams of fertility by which the greater part of the animal and vegetable worlds are generated and regenerated; of disease by which human populations are decimated; of the smokes and dusts which compose a notable portion of the sediment in lake and ocean beds, and so much of the natural manure of forest and prairie. Mankind will be instructed how to engross their habitations on wholesome places, and how to purify the atmosphere of cities from noxious vapors.*

But the largest future profit to accrue to the race from a universal and perpetual study of the air may be best summed up in the phrase "a true theory of storms for the use of sailors," the rudiments of which we already unmistakably possess; but which when well perfected for all sea-surfaces and sea-coasts will benefit in many ways the ever-enlarging fleets of ships and steamers, and their future thousand-fold expanded living freight. †

In *Physics* what wonderful discoveries have rewarded experimenters since the first application of the galvanic current to the production of mechanical movements by

* See Blasius on the Connection of Meteorology with Health in Proceedings Amer. Philos. Soc. 1875, p. 667.

† See Blasius "On Storms," 1875.—Proc. Am. P. S. 1876, p. 198.

Joseph Henry at Princeton in 1840! The telegraph system of Morse, followed by the writing telegraph of House, followed in its turn by methods of relay and duplication, and still later by the marvellous invention of the phonograph and now of the still more curious and promising phototelephone, will certainly be extended into all parts of that habitable world which it already encircles with its aerial, subterranean and submarine wires. The most distant centres of business are already brought within a few hours' reach of each other; the prices of money, bonds, commodities of all kinds, are regulated by instantaneous conversation in all the languages in Christendom; travellers find themselves as well supported and insured against disaster thousands of miles from home as in their own offices; the term foreigner will lose its prime significance; unwarrantable or capricious insurrections become impossible; criminals can no longer feel impunity from arrest whichever way they fly; the lost can be found, the truant reclaimed, the impostor gazetted in advance; and every new experiment at association with political, social or religious ends in view must become more easy and complete. The dismembered widely scattered body of Osiris has been gathered together by this Isis of physical science, and now first truly begins to live a divine life. Christendom is unified; and its sentiments, its plans, its energies so concentrated by telegraphic intercommunication, that nothing on a grand scale will be attempted hereafter except under the guidance of such a discussion by all governments, by all the moneyed syndicates, by all classes of men of science and of business, as must surely result in the best choice of methods and means, at the least possible outlay of the capitalized wealth of the world.*

* The three telephone companies of Paris have just been consolidated into one, and place given in the sewers for wires enough to serve fifteen thousand subscribers, through ten connected central offices, girls by day and boys by night shifting the connections so as to answer the subscribers' calls to be placed in communication with each other. Branch companies and similar systems at Marseilles, Lyons, and Bordeaux are already in working order. The navy has portable wires for practice and the army will be handled by wire.

Geographical maps are intended either to inform or misinform society. When they lie, they lie with the extraordinary force of all dramatic action as compared with verbal statement.

The nine-foot map of the Atlantic and Pacific Ship Canal Company, for instance, published in 1850, exhibited one of the most impracticable of canal-routes as so clear of obstacles, that the world has wondered why the work was not commenced; a level river valley; a large lake; six locks up and six locks down,—the Pacific is reached. But in fact Lake Nicaragua lies one hundred and twenty-eight feet above the Pacific ocean and is separated from it by a range of *active volcanoes*. Berghaus' great atlas shows twenty-eight on a line three hundred miles long; with eleven more extinct; that is, one volcano for every twenty-one miles; and one of the number, five thousand high, seated in the centre of the lake. In 1709, 1809, and 1835 the Cosaguina shook the whole Isthmus, on which it deposited a layer of ashes three and one-half feet deep. The French Government survey map of 1858 represents the proposed canal with its locks built into the side of *an active volcano with a double crater* ten thousand feet high!

Topography has improved its methods of representation in modern days; not as pictures pleasing to the eye and stimulating to the imagination (for no such beautiful maps are now executed as those of Italian geographers published two centuries ago) but as accurate delineations of real objects on the earth's surface in their true proportions of size and relative positions to each other and to the sea-level. The addition of *contour-curves* (showing equal heights above tide) to the more recent maps has been of immense value to several branches of science, especially to civil engineering and geology. The latest mapping method substitutes these for the old hachures for marking slope, and obtains all the relief which the eye demands by reinforcing them on the shady side.

The invention of *underground contour-curves* twenty years ago is now coming into use for mining engineering purposes, and opens a future prospect to the geol-

ogist of boundless extent and rich promise. The time must come when every mineral bed and vein, every up-throw and down-throw, anticlinal and synclinal, will be thus represented *pari passu* with mining operations; and civil engineers will follow the example of their brethren of the other caste in constructing underground contour maps of the rock-bedding in such tunnels as that which penetrates the Mt. Cenis, to show its folded structure,—that of the Innsbruck and Botzen line, to show its core of dolomite,—and that beneath the English Channel to show its fault.

Geodesy is the application of mathematics and geometry to the actual measurement of the earth;—first, for the determination of its true figure, which is not perfectly globular, nor regularly oblate, but slightly battered like an old billiard-ball, or an apple in the first stages of decay;—secondly, for the determination of the exact edges of the dry land, and the exact place of every watercourse;—and thirdly, for the exact height above sea-level of every object attracting man's attention or affecting his interests—hill-tops and valley-beds, steep cliffs and sloping plains, houses and other monuments of history.

The ordnance maps of Great Britain are on the scale of an inch to the mile, and of six inches to the mile, so that every man's house, barn and stable in the kingdom can be referred to on the paper. The Belgian map is equally precise. The Swiss map shows every foot-path in the Alps; and guides are unnecessary, if the traveller be hardy, fearless and judicious. The coast of the United States is nearly all mapped in the most minute manner; and the chain of the great lakes; and belts of inland triangulation are being carried from east to west across the continent. Arcs of great circles have been measured in South America and across Europe on the meridian of Paris, and through Russia. Germany and Austria are extending the area of this kind of work; Spain has lately been connected with Algeria, so that future surveys in Africa will have a base in common with the European measurements. The triangulation of India has been going on for years.

To all this must be added the Admiralty charts of the sea bottom on all coasts which the ships of Christendom approach; and a beginning has been made for a general measurement of the ocean depths, and a complete map of the ocean bottom in both hemispheres. Mr. Patterson has just published a map and a model of the curious basin of the Gulf of Mexico. How it would rejoice the heart of the geographer to get a glimpse of the maps to be published in the year 1981! How many questions wait for their solution until those maps be constructed! Yet geodesy will be as little exhausted then as now, and the maps of A.D. 2081 and A.D. 2181 will differ from each other in nothing but completeness.

It is not however merely the completeness of our knowledge of *what is now* that these centuries of geodetic work will effect. The repetitions which will be needful—made needful by the growth of instruments in precision, and by the extension and use of telegraph lines for time observation—will subserve quite a different purpose. Changes in river courses and coast lines have already been observed; two or three centuries of comparative maps can alone show the law and rate of these changes.* While successive land maps will determine the term of England's coal trade, successive coast maps will exhibit the rate of the destruction of the island by the waves in some places, and the growth of deltas, swamps and shoals in others. The height of no one alpine summit is as yet told with absolute truth; but by repeated surveys not only a close approximation to absolute truth will be reached for the top of Mt. Blanc, Monte Rosa, the Jungfrau, the Wetterhorn, and hundreds of other summits, but a comparison of heights so obtained in one century with heights obtained by remeasurements in the next century and in the next, will show which are the rising and which the settling portions of the Alps; and how and at what rate the warping movements range, which produce such

* See the map of Marseilles in the time of the Romans and now (Bull. Soc. de Géog. Paris, 1874) showing how the Mediterranean has worn away the cliffs.

earthquakes as those of Agram in 1880. And when this knowledge is far enough advanced in all the principal alpine districts of the earth, a comparison of data so obtained will teach much respecting the larger changes which the form of the globe is always and everywhere undergoing.

In the course of many centuries men will come to know whether the oceans make great oscillations from the south pole to the north and back again; and whether archipelagos be emerging from the Pacific and Indian seas, forerunners of wide continents, now under water; or, whether they be the disappearing remnants of ancient continents once inhabited by aboriginal men.

Chemistry and Mineralogy have peculiar blessings in store for the human race.

Previous to the discovery of oxygen by Priestley Alchemy was the rudest cookery of the inorganic constituents of the ground. Now it is one of the fine arts. In future it will furnish the mathematics of Metaphysics.

No other science has so uplifted the right reason of man. No other science has been equally successful in teaching men to think. No other science deals so entirely with the Invisible, underlying and informing the visible creation. No other science so habitually feels by calculation and thinks with the imagination.

As out of Alchemy sprang the noblest poetic fancy and the purest moral sentiment of the middle ages, so out of Chemistry has been born all that is honest, conscientious, patient and prudent in the physical sciences of our own day. There is no such check to the vague imaginings and reckless generalizations of natural philosophers, of all kinds, as that to which they have been, are and more and more shall be subjected by the ever-enlarging scope and deep-reaching interpretation of the intimate nature of things of this purest and sternest of all the spirits that represent the wisdom of God in nature.

Are there any limits to human knowledge? Is there any limit to the world's mysteries? What kind of a being will the chemist of a thousand years hence be?

But the answer to these questions is of interest only to the individual man. The interest which the millions shall take in the chemistry of the future relates to the quantity and variety of the accumulating applications of chemistry to the comfort and convenience of life. These cast their shadows before. Their kind and scope at least can be predicted.

By chemistry mankind is destined to discover and put to use a great number of economic processes which will first cheapen and then make abundant the raw materials of the arts.

Hitherto all that men have manufactured they have manufactured by tedious, laborious, painful, wasteful, and consequently costly methods. Waste—infinite, irrecoverable waste has characterized all crafts. Material was plenty, because tools were bad, and the rich alone could be supplied. When tools improved and goods became abundant and cheap, the crowd demanded, and the raw material grew scarce. The problem of the future is to wrest from nature enough stuff to manufacture for all. The solution of the problem is to be sought for in a reduction of waste to its possible minimum. In this search, as in all other intellectual paths, chemistry takes the lead.

The chemist's whole education consists in detecting residua; recovering what has tried to elude observation and escape; committing every element under bail to keep the peace and behave itself. Chemists are the *gendarmérie* of the manufacturing world. To them has been consigned the task of deciphering all the adulterations of nature and art; the qualities of the raw ore, and of the metal when brought to nature; of the soil and the manures it needs; of salts and infusions, and the drugs made from them; of oils, and their soaps and acids; of medicinal plants and their principles; of paints and bleaching powders; yeast and the bread it raises; in a word every article of food which man grows, every fibre out of which man's clothing is woven, every stone man builds with, every fuel he burns, the clay of his potteries, the sand and alkalies which he turns into glass, the slag which flows from the furnace

or flies from the anvil, and the iron which is rolled into rails. Every drug-shop has a chemical laboratory behind it. Every iron furnace keeps a chemist in employment. Chemical experts swarm in the great mineral districts. Even justice acquits or condemns the murderer according to chemical analysis. The assayer accompanies the explorer into unknown regions; and great movements of population will be governed in the future, as they have been in the past, by mineralogical observation confirmed by a verdict from the laboratory.

But all this is nothing to the effect of chemistry on the future world by reason of its inventive faculty. While the resident chemist guides the miner and guards the furnace-man in the hourly progress of their ordinary work, he is devising modifications of the process of production, and inventing transformations of useless refuse into useful materials for other industries, the sale of which may diminish the cost of work, and institute some new and flourishing production. As the years and centuries roll on, the waste of raw material will be eliminated from human industry, and the cost of every manufactured article will be reduced for the benefit of every class of consumers; the percentage of return for labor will be increased; time will be saved; and savage methods will be replaced by scientific methods all over the earth.

In *Mineralogy*—the transcendental aspect of which is of no interest to us here except for its bearing upon the growth of the human mind—and especially in Metallurgy (which is Mineralogy practised under the instruction of chemistry) what has just been said finds its illustration.

With an unfailing abundance of two minerals, the destiny of man is made safe. With a hollow coal fire and an iron bar a man can arm himself against all enemies and equip himself for every kind of useful work:—with an axe to hew the forest, a chisel to cut through the rock, a shovel to level the road, a ploughshare to till the soil, nails to build his house, axle and springs to facilitate the transport of his goods.

The uprising of the old forest from its sleep of ages underground, glorified into bituminous and anthracite coal, was like the reappearance of the sun in a new morning of human history, calling an awakened world to fresh existence and universal activity. The use of coal was confined at first to the immediate vicinity of the outcrop of the bed. In course of time small quantities began to be carried on mules and in canoes to smithies at some distance. When the canal-lock was invented at Viterbo in 1481, and the French canals of Briare (1605-1642), Orleans (1675), Languedoc (1667-1681) and others on the Continent had led the way for the Duke of Bridgewater's first English canal (1758) and the English canal-mania, which lasted forty years, the foundation was laid for enormous colliery operations and a general use of the mineral fuel. The railway-mania of the present century was a repetition of the canal-mania in a more intense form; and its effect upon the annual production of coal has been to carry it up from ten million tons (in 1800) to one hundred and thirty-six million in 1877. Nine-tenths of this is consumed in Great Britain; the remaining tenth is sent in ballast to all parts of the world.

The present annual production and use of hard and soft mineral coal in the United States is supposed to be between sixty and seventy millions of tons, shared between blast-furnaces and rolling-mills, railway locomotives, steamboats, steam-mills, gas-works, and city stoves and grates.

The production of anthracite was 350 tons in 1820; 850,000 in 1840; 8,500,000 in 1860; and about 25,000,000 in 1880. In spite of the enormous waste in mining and screening anthracite (a waste of at least 50 per cent. at present) there is enough in the ground to furnish fifty millions of tons per annum for use for 250 years.* But the deposits of semi-bituminous and bituminous coal in the United States are of such extent, so undisturbed and so near the surface, that an annual

* P. W. Sheaffer, Proc. Am. Asso. F.A.S., Saratoga, 1879.

consumption of 200,000,000 tons is possible for 10,000 years.*

It is supposed that the total consumption of mineral coal will in the present year exceed 300,000,000 tons; and that the extension of the railway system, the expansion of steamship commerce, and the planting of steam manufactures in India and China, will enlarge this consumption to a thousand million tons in less than half a century.

The mechanical power of one pound of good coal equals that expended in one day of human hand-work. Most of the coal raised from under ground is burned for warming mankind, cooking food and making iron. But if only one ton of coal in every ten be consumed for steam machinery, Great Britain is at present using a machinery power equal to *one year* of labor performed by 100,000,000 men; and the United States is using a machinery power of 40,000,000 men. Since the male adult population of the United States is about 10,000,000, coal adds the labor of four machine men to that of every living man in the Republic; and as England has a male adult population of about 5,000,000, her coal places beside each living man a machine of twenty-man power.

These machine-men indeed have to be built and nursed and served; they eat and drink voraciously, require sleep, and are improved by education (or invention); must be well housed and carefully and expensively dressed; demand the services of menials and a police; even produce offspring. But these are in mature power from the moment of their birth; and the larger and mightier the machine the less service *in proportion* it requires. It indulges in no expensive amusements, never strikes for higher wages, has no blue Mondays, is always at its post, and always obedient to the touch of the commanding hand — a conscientious, punctilious, loving slave, like Ariel waiting on Prospero.

The population of the world may therefore be said to be changing. A new race of anthropoid machines has

* See general estimate in Geol. Penn., 1858, p. 1017.

come into existence; and its rate of increase is so rapid, and so little subservient to any known Malthusian law, that a prophecy may be ventured: viz., that in one or two centuries from this, while the human race will remain substantially and as a whole about as numerous as it is now, the man-power (steam-engine) population of the world will exceed it ten to one. And perhaps the greatest of all the problems of the future is: who will own control of this man-power? how will its distribution be effected? how far will it supplant rather than supplement the work of living men? and, above all, what will be the consequent increase of human idleness on the one hand and of human luxury on the other? For it is evident, that, could coal-power be equally distributed to all homes, a man's *necessary* day labor could easily be reduced from ten hours to one. But it is equally evident that steam manufacture will always concentrate itself on spots of the earth's surface, leaving a large majority of the human race indifferent spectators of its effects.

Another important feature of the case must be regarded. Apart from the first and current expenses of mining and machinery, the *theoretical* power in coal is never obtained; not one tenth of it; the rest is wasted in transmission, through boiler plate and boiling water, crank, cog and strap. Part of the future of civilization is to be determined by the gradual elevation of the percentage of power left available.

But even with the small available percentage of coal-power remaining unchanged, the rapidly increasing annual production of coal mines, and the steadily rising rate of increment, the accumulation of work-power at the disposal of working man towers before the philosophic imagination like mountain masses before the eye of a traveller from the plains.

No possible discoveries of new motive powers can prevent the perpetual use of coal, any more than the discovery of steam power has caused the use of the horse to be forgotten. Wood will always be burnt; coal will always feed steam-engines and gas-holders, whether electric motors and galvanic lights be success-

ful inventions or not; and the same a thousand years hence as now.

Iron too can never be deposed from its royal throne among the metals. Nothing can replace it. Its production will always be on the increase. Its applications will be ever and ever more numerous, various and apt. To the lake-dwellers of Switzerland it was more precious than gold or bronze, for fine threads of it are inlaid as ornamentation on sword handles preserved in the museum at Berne. The Roman soldiers conquered Gaul merely because their sword-blades being of iron would not bend; they killed their opponents while these were stopping in the thick of the fight to re-straighten their bronze swords across their knees. The followers of Odin settled Europe and enslaved the stone-age populations by virtue of the iron they brought with them from the land of the Chalibes. Iron made the conquests and colonies of Spain and Holland, France and England possible in both hemispheres. Iron alone makes universal international communication possible. Whether it require two centuries or ten, the globe is forging for itself as complete a shirt of chain mail to cover itself from head to foot withal as ever Knight Templar wore. The meshes become ever finer and closer. The tissue spreads further and further, from district to district, from province to province, from empire to empire. No desert will remain exempt from the iron network. Each mountain vale will receive in time its proper branch-line. Every mountain spur that hinders travel will be pierced. The bridge has become iron; the station-house iron; the telegraph post will be iron; the locomotive is iron; the freight car is of iron in whole or in part; the ship becomes iron and Elisha's axe-head floats.

In prehistoric days iron was more costly than gold, because made by hand in a hole in the ground. It is so made by African savages and Hindu blacksmiths yet. In Roman days, the forge was planted at the head of a ravine and the blast was made by the wind hurtling up the gorge. In the middle ages the mountain stream was diverted so as to fall through a vertical wooden

pipe, and with the moist air thus driven downward and led off sidewise the Catalan forge was blown. Then the German high oven was invented, and cast iron was bestowed as a divine boon to the race, inaugurating the real age of iron. Higher and higher rose the furnace stack until it towered 120 feet into the air, with coked coal for its fuel, Scottish blackband and Yorkshire iron stone for its burden, and air heated to 1000° Fahrenheit forced into the *tuyère* holes under a pressure of 16 lbs. to the inch from twin blowing engines costing \$100,000 to construct.

The production of cast iron in the United States in 1880 reached 4,295,414 net tons, (40 per cent. more than in 1879, the year of largest production) made by 446 furnaces in blast out of 701 in existence.

In 1839, the first casting of anthracite pig iron was made, and in 1881 its amount reached 1,807,651 tons; 1,950,205 tons were smelted with bituminous coal and coke; and 537,558 tons with charcoal. Of spiegeleisen 20,000 tons were made for the Bessemer works.

The mere surplus *exports* of iron and steel from the British works amounted in 1879 to 2,640,000, and in 1880 to 3,560,000 tons.

Bessemer iron was first successfully and regularly made, in 1861, by Mr. Brown at St. Seurin, a few leagues north of Bordeaux. In 1863 the new process was established in Sweden, while the great inventor was still struggling to perfect it at Sheffield, and it had been tried and abandoned at Liège, at Creuzot, along the Rive de Gier and at Allier. In 1863 Peter Turner made his first blast at Leoben. In 1872, 120,000 tons of Bessemer iron were made in the United States, and 1,203,173 in 1880. In 1872, 94,070 tons of steel rails were rolled in the Bessemer works of the United States; in 1880, 917,592 tons. (See page 354.)

In twenty years, all the main railway lines of America have been relaid with Bessemer low steel rails made at Troy, at Bethlehem, Harrisburg, Johnstown, Pittsburg, Cleveland, Chicago and St. Louis; and in Europe mammoth cannon and the plates of iron clads, the axles and tires of railway rolling stock, and a thousand other

shapes are produced of this new form of iron, the cost of which at first was \$160 a ton and is now \$40.

This wonderful revolution in the manufacture of malleable iron for cast iron has not however set aside the puddling and boiling furnaces; strange to say, it has not destroyed the charcoal high stack furnace. But it pours an incalculably larger flood of ingot iron upon the markets of the world, and has multiplied and enlarged the rolling-mills, while stimulating the development of iron mines, and spurring the exploitation of coal to its upmost speed.

Considering now that iron ore is the most plentiful of all minerals except coal, and absolutely ubiquitous in the earth's crust, what prospects stretch before us in the future whichever way we look! On iron all true civilization depends for its material power of work; and henceforth iron can be produced without stint or limit in all lands, by all nations. Surely the greatest chapter of Man's Destiny as a worker has been opened for our reading.

With Bessemer iron all the rivers of earth will be spanned; all public edifices will be made fireproof with iron beams and concrete floors; archives will be safe; museums and libraries, hospitals and asylums, warehouses and their wharves will become permanent; cities will be supplied with water, gas and condensed air for motive service; and telegraph and telephone wires will be protected in iron pipes and culverts. Already the oil fields of Pennsylvania are netted with thousands of miles of iron tubing for the transportation of petroleum, and pipe lines traverse hill and valley to bring the precious fluid to the cities on the seashore. What more iron is to do for man who can predict? But this is certain, that the modern methods of producing this metal at a low cost and in infinite abundance will expand the capacities of all the arts and extend the tools and symbols of civilization to the remotest provinces of the world.

But, although Coal and Iron are the Alpha and Omega of all the future, the rest of the mineral alphabet, the metals and bases and salts, will play their parts

and share in the enlargement of human activity. For every ore chemistry is providing better processes of treatment, cheapening cost and enhancing quantity; diminishing waste and suggesting new uses. Many another Stassfurt will be discovered; and when Greenland has ceased to furnish its criolyte, the alkalis will be obtained in still greater quantities from other earths in many lands.

It is said that the total value of finger rings worn by the people of the United States amounts to \$50,000,000. Luxury and pleasure must increase with every other quality of civilized life. Jewels will be sought for, even when banks and saving institutions have set aside their chief use — that of an easy and safe investment in times of bad government and in places of personal danger. Nothing that man has once esteemed will man ever abandon; and the destiny of the human race as a whole is what only the destiny of a few has in past times been: for every human being to make himself pleasing in his own sight.

The *Geological* future of man's destiny is not confined to what the races will suffer or enjoy by geological changes in the face of the earth; but will chiefly consist of man's discoveries in the underground and the uses thereof.

Upon the great blank canvas of profound ignorance lasting thousands of years, the few first bold strokes of the coming picture arrest the eye and excite the liveliest admiration.

Toward the close of the last century, a few thinkers began to see that the globe was an organic being and had grown. In the early part of the present century, an examination of its skin was timidly attempted here and there. Less than fifty years ago, the States of Europe and many of the United States of America commenced extensive geological surveys, based upon geodetic meridian line- and coast-surveys; directly in the interest of land ownership and commerce, but indirectly stimulating to all departments of physical science.

Once embarked on this voyage of discovery, there was no return to port. Once established, this campaign against the closed fortresses of Nature, a large corps must be well armed, provisioned and transported. Hence the erection of one observatory after another, one laboratory after another, one museum after another, each equipped with more and more powerful and accurate apparatus. Apparatus reacted on observers, and observers on apparatus, constantly improving and multiplying each other. Every day now beholds the invention of some finer method or piece of machinery, like Langley's photometric balance by which, at last, the radiant heat of the moon is really proved and really measured.*

The early work of the British, French, Swiss, Belgian, German, Russian and American surveys was of the nature of a systematic reconnoissance. In the course of the next twenty years enough became known to allow of the subdivision of continental areas into provinces and districts. Renewals and reorganizations of surveys which had been stopped took place. Schools of mines became numerous, and geology with its adjunct sciences educated for its work a multitude of young and fresh minds. The mere publication of work done became a world of literature in itself. Improvements in lithography and photography multiplied maps, sections, and plates of fossil forms indefinitely. The new science of microscopic rock-analysis was added to geological chemistry, and the employment of chemists in the laboratories of Bessemer iron-works doubled the number of investigators and quadrupled the amount of geological survey work.

Meanwhile the new applications of steam to industry and commerce made vast demands on geology, first for coal and then for iron; and government surveys became insignificant in comparison with the restless and ubiquitous activity of an army of experts employed by incorporated companies of private individuals. The knowledge

* First announcement of this substitute for Melloni's pile, *Am. Jour. S. & A.*, March, 1881.

thus obtained did not at first become the property of the world; only its fruits showed. But knowers were multiplied and drilled; and these, naturally desirous of public credit for the work they did, began to publish first their crude and afterwards their maturer memoirs under the auspices of a multitude of new lyceums, societies and associations which they had combined to organize, being themselves excluded from the venerable societies of science because as yet unknown. From these now well-known new geologists, mineralogists, metallurgists, chemists, physicists, botanists and zoölogists, the old societies have been recruiting their ranks, thinned by death, and infusing thus into their old veins new blood.

The accidental discovery of great reservoirs of petroleum, the accidental discovery of vast quantities of gold in the California gravels, the accidental discovery of a multitude of rich silver veins in Colorado—three discoveries following each other at short intervals of time—while they introduced the greatest possible changes in the movements of emigrant mankind, and caused the founding of new States, the building of great cities, the conversion of Australasia into an English-speaking Christendom, the settlement of South Africa, the readjustment of the values of all articles of trade, food included, and a new renaissance of fine art—exerted another and more lasting influence upon science in converting whole populations of handworkers into wide-awake observers, investigators, scholars and teachers of each other, collectors of all that is curious, and energetic explorers of every omitted, overlooked accessible or inaccessible nook and cranny of the surface of the earth.

Out of this new class of mankind, numbered already by the hundred thousand, come inventors without end; and among all their inventions the Diamond Drill is for geology the most important; and is certainly destined to inaugurate the future study of the as yet untouched profounder depths of the underworld; to limit for us the *real* areas of the coal measures; to discover beneath destitute regions an underground plenty of iron; to

settle for us the problem of internal heat; and perhaps to detect for us the cause while measuring the direction, the amount and the rate of crust movements.

To imagine what the geological destiny of man is sure to be a century hence, it is only necessary to compare the mining industries of the Roman world with ours.

What was the stowing of a dozen tons of the precious metals on a trireme at Cadiz for a month's hard sailing and rowing to Ostium, compared to the lading of a million tons of anthracite on Reading railway steam barges at the Richmond yard in Philadelphia, for a two or three days' run to New York, Boston or Norfolk? What was the packing of amber, bronze swords, gold torques, amulets, gems and a few small iron-blooms along the Appian and Flaminian Ways, compared to the roar of two hundred freight trains per day, carrying 100,000 tons of ores and coals, iron tools, furniture, dry goods, grain, cattle, groceries, fruit, books and newspapers, in two weeks across the American continent.

Or, take the rate of increase of our length of railway lines, of the number of mines of all kinds, and of the expansion of smelting works and finishing mills and factories for the last 20 years, and project that rate forward for a single century; then, calculate the amount of exploration and exploitation to which all that must give rise—the geographical, topographical and geological surveying, ever on the increase; the penetration of vast stagnant populations by these irresistible impulses to knowledge and industry; and the merging of such populations in wide-awake, laborious, curious, inventive, efficient, affluent Christendom, broadening the arena, multiplying the games and enhancing the prizes;—what a world it will be!

Then will the Diamond Drills revel in the deep. Governments will pay the price for profound research. Instead of single holes, pairs will go down, by which the structural sections can be made. Rows of bore-holes will be drilled across an entire kingdom. Not

a stratum will be missed. Usually shallow, they will at intervals be sunk to great depths, to test underlying old topographical surfaces. Here and there a single one will be put down 2,000 or 3,000 metres, even if it cost a fortune and the work should last for many years.

Such will be the geological spirit of the coming age.

A recent book, entitled "The Ground of the City of Berlin," by Herr Lossen, published at the cost of the municipality, gives, as the result of 316 borings in and around the city, the most precise description yet attempted of the nature, order and extent of the various strata composing the Diluvium of North Germany; and the depths and values of the various water-bearing planes to which wells must be sunk, or holes bored, for public or private use.*

Every city of the future will execute such a work for itself; and not for itself alone, but for an entire province.

The future career of *Natural History*, and the influence of its two branch-sciences *Botany* and *Zoölogy*—recent and fossil botany—recent and fossil zoölogy—upon the future welfare of the human race, can be easily signalized.

The task before these sciences in the future is twofold:—

1. To continue and complete the catalogue of *living* species,—to obtain a perfect knowledge of the habits and habitats of each,—to compare them in various regions,—to make out their migrations,—to estimate the value of physical influences tending to change their forms, or modify their organs,—and to discover such passages from one variety, species or genus over into another:—

2. To continue and complete (if it be not possible ever to exhaust) the catalogue of *fossil* forms,—to obtain the whole range of mere varieties in each species,—to eliminate from each genus all species which by passing

* See Schriften Phys. Œcon. Gess., Königsburg, 1879, Sitzung, p. 46.

insensibly into other closely allied species cease to be distinctive species,—to fill up the gaps between genera,—to multiply indefinitely the number of synthetic types,—to correlate and weave in together extinct and recent faunas and floras, by which lacunæ in the one set are supplied from the other,—to establish the true order of probable evolutions of types and their elevations and degradations,—to search for fossil representations or indications of the structure of organs, and to connect these plausibly or by necessary logical inference with their several circumstances of climate, food and warfare.

The machinery for this study can hardly be very different from that in use, since the microscope has been brought to its present perfection and deep sea dredging and trawling has become a familiar art. Again, the question of the past and present has been one of *quality*; that of the future will be one of *quantity*. The reconnoissance has been made; the detailed survey will go on for a thousand years.

But the practical side of Natural History presents itself with a grand aspect.

Formerly man dwelt in the forest, and among the beasts, as a hostile intruder, or as a barely tolerated guest.

In course of ages man formed alliances with some of the animals and some of the plants, and grew powerful enough to wage successful warfare against the forest and its denizens.

In modern days, man has established his government over all living things; replants the forest which he has cut down; cultivates poisonous herbs for medicine or pleasure; preserves wild beasts for the exercise and discipline of his own mental and corporeal faculties; and feeds the most useless, noxious and savage creatures, merely to sate a vulgar curiosity, or to advance the refinement of science.

In future ages, the animal and vegetable worlds will pay him back a rich reward for what he now does heedlessly, wantonly, or scientifically alike. From the cost of human life in experimental cooking, in the hunt of

lions and bears on land and of whales and sharks at sea, in the exploration of arctic snows and tropical deserts to fill the museums of Christendom — from the outlay in Botanical and Zoölogical Gardens, experimental farms and parks of acclimation, government seed distributions and fish commissions — the first dividend of a mighty income has already been received. No investment the human race ever made will satisfy it better in a business point of view.

Hitherto the spontaneous exercise of the creative energy inherent in the planet sufficed to distribute and arrange its animate inhabitants, man included. The destiny of man is that of the heir to an aged monarch who gladly abdicates the throne. Mankind will rearrange its own residence first, and then regulate the subordinate place and mode of life for every tree that waves, every seed that falls, every beast of the field and fowl of the air, and even for those lawless vagrants of the pathless sea on whom nature seems to have bestowed a charter of absolute independence.

The effects of man's improved civilization upon the cereals and tubers must always be limited by the number of arable acres circumscribed by mountain-ranges and the sea-coasts, over which human wit and will have no control. But within these limits chemical geology will assign the proper planting for the proper soil; and scientific agriculture will assign the minimum of right enrichment of the soil for producing the maximum of food for men and cattle.

Scientific arboriculture will not only weed out the useless woods and multiply the useful; replace the waste of present forests, and repress wanton destruction; but will protect exposed hill-sides from undue erosion, and the inhabitants of valleys from ruinous débâcles; while it will provide desert belts of country with rain evaporated from stored-up snow and artificial lakes. The irrigation of the globe will employ all the resources of engineering science, when these shall have been once set free from the miscalled industries of war; and food will pay for growing, when all the natural avenues of water transportation have been rectified,

and rendered at all seasons both copious and safe, by retaining reservoirs in the forest, and by jetties and dredged channel ways along their open courses through the plains.

The breeding of cattle for labor and for food, the selection of poultry, the use of counter parasites for parasitic pests, the acclimation of varieties from other climes, but above all the government of fish-breeding, on the grandest scale, for inland lakes, for rivers and for soundings on the coasts—all these operations, already successfully begun, will become the work of the whole world, and increase the supply of food, and the wholesome occupation of the millions, beyond our present powers of computation.

If any one supposes that a thousand years will be enough to finish all this, he has only to regard a globe and note these facts:—1. That human population is concentrated on a few limited areas;—2. That the communications between food and hunger have not yet been completed;—3. That the entire continent of South America is still virtually uninhabited by man, and that great regions of North America are also to be occupied;—and 4. That the work of mutual destruction has not yet ceased over the whole continent of Africa and a large part of Asia. For the first thousand years, civilization will be occupied in securing itself on one-half the land, and preparing its ways and means by water for afterwards repressing the disorder of the other half, preparatory to its reorganization on the basis of a beneficent commerce and a permanent peace.

The discovery of the potato, of tobacco and of caoutchouc are the most notable in modern times bearing upon the conditions of life. The commerce in American grain and cattle and of preserved vegetables bids fair to dispel future famines. But the transport of grain has always been a marked feature of civilization. The difference now is that man no longer migrates towards food—food comes to him from afar. This will do much for rendering populations stable.

The destruction of the American forests in certain

districts is something enormous. For example: the president of the Chicago Lumber Exchange reported March 7, 1881, that the receipts of lumber at Chicago during 1880 amounted to 1,564,000,000 feet, and predicted the final exhaustion of the pine forests of the country in twenty years. White pine will then become extinct. The waste of pine wood in Pennsylvania has been scandalous. The best trees only were taken to market, and it is reckoned that not more than one-tenth of the actually standing pine forest was utilized; the rest being lost for the use of man. Had the Commonwealth watched over this precious treasure committed to its care, not only might much of this reckless destruction have been avoided, but if a law had been enforced to the effect that for every pine tree felled two young trees should be planted, future generations would enjoy a natural right of which this generation has deprived them.

The forestry regulations of the Old World must in course of time come into vogue in the New, and individuals must be taught obedience to the rules of public interest, and compelled to recognize not only the rights of existing society, but the welfare of future generations.

The United States laws of 1873-74, giving 160 acres of government land free to persons pledging themselves to plant trees, failed in operation owing to the impracticable conditions imposed upon the planter. Public sentiment secured their general evasion. Railway companies have begun to plant trees along their lines, and farmers of the West, pressed by private necessity and far from coal, are planting largely. In Wales, whole mountain-sides have been made nurseries of the Norway larch. There are now Schools of Forestry established in France, Germany, Austria, Russia, Sweden, Switzerland, Italy and Portugal, in which arboriculture is made a science, as well as an art, and governments offer large inducements to the people to plant waste lands. The German Government not only plants all roads, but buys up all private lands unfit for agriculture or pasturage to establish forests on them.

The people of the United States will in time learn

the lesson of their old charcoal iron-smelters, that it only requires 20 years to rear trees fit to cut; that a careful trimming and regular succession of cutting grounds will secure even from an ordinary farm sufficient fencing and building stuff, and fuel, from generation to generation; and that species may be brought from other places which will flourish better, grow faster and meet the local necessities more exactly than the growth which stands before them.

The destiny of the forest is to disappear before the axe of the pioneer settlers of all the wild regions of the earth. The destiny of the prairie, the pampa, the steppe and the savanna is to receive a cunningly selected forest from the hand of man. This process of equalization in field and forest will imitate the processes of Nature, by which the mountains are being lowered, and the lowlands raised, all over the world, through the agency of countless myriads of rivulets. In the end, the whole earth must resemble a fair garden, and a fertile farm; the very desert, condemned geologically to eternal sterility, being destined to its own special kind and degree of amelioration.

Physiology, Anatomy and Medicine as sciences, pure or applied, regard man as one of the animal races; but it has already appeared that their final conclusions cannot be reached by confining their researches to the human frame. The health or sickness of man is now studied in close connection with that of other creatures; and this comparison will be an endless occupation of the human intellect until comparative zoölogy itself becomes exhausted. In this field also experimentation and observation supplement, stimulate and check each other. The age of empiricism has not closed; nor should it close until every possible trial on man's constitution of every vegetable and mineral reagent shall have been thoroughly made and intelligently recorded and compared.

But medicine is fast resolving itself into hygiene; and the destiny of man is to free itself as completely from medical as from all other kinds of superstition.

Air, water, food, sleep, work, pleasure and cleanliness are destined to resume the pharmacopœia of the future.

In this the gain will be again one of quantity, not quality. No man of future ages will grow taller or stronger, or have a sounder brain or liver, than thousands in every generation have already had. The constant weight of the earth on which man lives determines, once and for all, the mean weight of male men at 150 lbs. and the mean weight of females at 120. There is no changing that, whether there be a millennium in view or not. And within the scope of just so much condensed hydrocarbon-compounds, and no more, must be located all the bodily organs, none of which can be spared, nor their number, quality nor functions increased or improved. Man *as man*, is already and always has been an absolutely perfect creature. His destiny is to continue to be the same perfect creature as he always has been.

But *man the individual*, and woman the individual, realize the perfection of their design only when their individual lots are cast in pleasant places and under circumstances favorable for enjoying their goodly heritage. What we are to expect from the physical sciences is to instruct ever-increasing numbers of human beings in hygiene:—how to marry suitably; how to breed safely; how to eradicate hereditary taints of blood from their offspring in infancy; how to give their organization free play to perfect itself; how to guard their adolescence from depravity; how to feed and clothe themselves in all stages of their mortal career; how to reform the maimed and restore the debilitated; how to regulate work and recreate vigor by sleep and amusement; how to drain and ventilate the dwelling-place, and how to provide comforts for old age.

In a word the Destiny of Mankind is to realize by the thousand and by the million, more and more as time rolls on, an actual approximation to the perfect standard of healthy activity exhibited hitherto by single individuals, isolated communities or favored classes.

Note to page 341. The statistics of the English iron trade are like the hands upon a clock to the thoughtful student of human economics.

The latest stroke of the bell rings out thus, from the annual report of the British Iron Trade Association. The following table shows the distribution of the pig-iron production of the United Kingdom in 1871, and that in 1880. That which will arrest the reader's eye, will be the enormous increase of pig-metal consumed now in making *Bessemer* and *Siemens steel*:—

	In 1871.	In 1880.
<i>Pig-iron, total made,</i>	5,667,179 tons.	7,741,000 tons.
Converted into wrought iron,	2,486,000 "	1,950,000 "
" " <i>Bessemer steel,</i>	220,000 "	1,220,000 "
" " <i>Siemens steel,</i>	35,000 "	295,000 "
" " <i>tin-plate iron,</i>	120,000 "	265,000 "
Applied to foundry purposes, etc.,	1,748,721 "	2,379,371 "
<i>Surplus, exported,</i>	1,057,458 "	1,631,629 "
Total,	11,334,358 "	15,482,000 "

LECTURE XIV.

THE SOCIAL DESTINY OF THE RACE.

HISTORY is the poor, imperfect, distorted, mistaken record of man's past destiny.

The science of History is a partially successful restoration of the old portrait of the human race, with new paints, under consultation with its best friends.

Can any task be more hopeless? Oh, it is not at all hopeless. What are the monuments of antiquity but faded photographs? What are buried statues and steles, buried urns, arms and tools, but family records? What are dead languages but fossiliferous strata in which lie safely preserved for our examination millions of words and grammatical inflections each of which restores to us some mental conception of our ancestors?

The analogy of the present will explain the past. The papyrus of Turin is in a much more sadly damaged condition than is the book of human history.

To collect all the mutilated leaves of this book and to decipher all the lines of writing on them — this is part of the future destiny of man.

The revival of enthusiasm for the study of Antiquity and its antiquities in the midst of a most practical and prosy business world, and in the face of a whirlwind of physical science, is an amazing phenomenon. Never did human beings seem more wholly engrossed in the present; yet never were there so many nor such zealous antiquarians. The rush forward is unprecedented, universal, irresistible; yet some thousands of thinkers stand with their backs to the future and their faces to the past, letting the crowd sweep past them. The out-

put of coal and iron is parodied by the output of arrow-heads, coins, papyri, torsos and skeletons. Troys upon Troys are stoped at the archaeological mine of Hissarlik. Mycenæ is searched for the armor of Agamemnon. The excavations at Olympia are feeding the Museum at Berlin. Apollo's shrine is found spanning a chasm on the peak of Delos.

Men are now living who have witnessed not only the institution of free government, the invention of steam, and the spread of the telegraph, but the recovery of the lost languages of Egypt and Assyria, the uncovering of Nineveh and Zoan, the publication of the ancient inscriptions of India, the translation of the Veds, the collation of the folks-lore of a multitude of nationalities, and the establishment of the Philosophy of History on a permanent critical and scientific basis. Every university has its chairs of ancient learning from which the copious restorations of past human life are explained to eager students preparing themselves for fresh expeditions and explorations at the very scenes of old events. Historical, Antiquarian, Numismatic, Archæological, Anthropological, Oriental societies are springing into active life, not only in the national capitals, but in the smaller cities and towns of all countries. Peripatetic congresses of antiquarians assemble at some different centre of observation each successive year, and appoint committees to investigate the most promising localities of the neighborhood. The Roman army-itineraries are studied for the purpose of recovering prætorian stations, which may be searched for tesserae, carrying trade-marks, to elucidate ancient manufactures and lines of commerce, or consular names and dates to rectify chronology.

A topographical survey of Palestine is accomplished by the English Church in obedience to the new scientific sentiment of its Deans and Bishops. The Sheriff of Islam grants a hateef to the agents of the British Museum to violate the graveyards of Kuyunyik for the purpose of discovering in the palace-library of Assurbanipal the Babylonian original of the Hebrew story of the flood.

And where and when will all this end? Is there a natural term to the awakened curiosity of man regarding his origin, his career and his destiny? Can any limit be set to the wealth of monumental lore concealed beneath the soil of plains which have been cultivated for three thousand years since money was first coined and buried on the approach of the invader, whose departure left a track of smoking ruins behind him, or at the commencement of a commercial journey from which the merchant never returned?

Rome has been burnt to the ground seventeen times. Every time its houses fell they made a layer of tools and furniture, armory and statuary, amphoræ and lamps, jewels, coins and tablets, to be rediscovered by modern builders of high houses with deep foundations, by street contractors driving new culverts, and by the Accademia dei Lincei with its sharp eyes and pricked-up ears. Every now and then a subterranean church of St. Clemens, or a Marmorium, is revealed; and all the world takes railroad or steamboat to see and admire it. Sometimes even in London and Paris a temple to Jupiter or a bath-house of Julian is discovered.*

Surely as the number of antiquarians increases and a Chinese sentiment of ancestral veneration pervades the west, the rage of discovery will only burn the fiercer, and the right knowledge of the past history of mankind will frame itself the faster. Upon the past as a high place of vision the prophet of the future sets his chair and writes his oracles.

This antiquarian lore is looked upon of course by the uninitiated as a child's play, or a fool's errand. But in the laboratory of human thought it is proving itself to be the *aqua regia* of reason, the universal solvent of popular delusions, by which the education of nations will be purified and fixed. Criticism needs precedent facts. Without these, criticism is the mere caprice of fancy or the prejudice of ignorance. Informed by a sufficiency of proven data, criticism is the right govern-

* The table plate of Valens has been lately found on the field of Hermann's victory.

ment of reason dealing with what most nearly concerns humanity in all ages past, present and to come. Porphyry set himself with the seriousness of Kant and the youthful zeal of Paul to investigate the popular religion of his day, and wrote his great work "On the Philosophy to be drawn from Oracles" which Eusebius quotes so largely. But his undertaking was a failure, both for himself and for his fellow-men, as he himself sadly confesses; because it was impossible, he says, to verify the facts which he had set himself to criticise. Until archæological science had done the work it has done, serious men of modern times were in Porphyry's case. Now, enough is already known to make most of the popular beliefs suspected; and the skilled criticism of past facts, conducted by men bred to thinking according to the rules of modern science, has already greatly modified those conceptions of God, the world, and human duty which are habitually entertained and acted on by modern society.

This readjustment of the ideas of mankind must become more and more wide-spread and operative; affecting profoundly the status of every community of human beings; and introducing a state of things throughout the whole world, a thousand or several thousand years hence, impossible to describe by anticipation.

One thing alone is plainly visible beforehand: the Mythology and Ethnology of the past will both of them pass out of the general human belief and memory, and be replaced both by Christian views of the government of the world, and by an international friendship, in the mild flame of which all antipathies of race must be slowly consumed.

The modern science of Mythology deals only with historical facts, it is true; and is itself unimpassioned; believes nothing of itself; merely collects, collates, classifies and accounts for the faiths which have in all past ages prevailed, and which still survive as prevalent motives of conduct with millions of men and women. But in doing this it has collected and will continue to collect and arrange data for an exalted, far-seeing,

fearless, theological criticism, the slayer of superstitions, and the herald of true religion.

The science of Ethnology is making the same kind of passionless, unprejudiced, critical study of the past conduct of the race, in its restless migrations backwards and forwards, by sea and land; the early settlements and centres of dispersions; its lines of march; its invasions, extirpations, overlappings and commixtures; its refuges and establishments; its more stable subdivisions, and their present arrangement; its modifications of individual or collective forms, features, colors, tongues, occupations and ideas;—in a word, a thorough study of the old and the new meanings of two terms: *race* and *nation*.

What is as yet the outgo from all this studious learning—no longer merely gathered from books, or by hearsay of uninstructed travellers, but from personal investigation by trained men of science, sent into every region for no other purpose, furnished with all possible facilities for a successful examination and discussion of facts, and subjected to the closest cross-examination at the seats of universal knowledge on their return?

It is, in the main, this:—the essential unity of the human race, and the striking similarity of its principles and methods of earthly existence.

When it is observed that the daily press, driven and distributed by steam, lets nothing escape publication, but compels the uninvestigating multitude to hear the report of all investigation, even on subjects in which it feels but little interest,—when one notices the rapidly spreading popular taste for descriptions and pictures of whatever is foreign, strange or curious,—when a calculation is made of the probable increase of such literature and of the number of its readers,—the inference is inevitable that a sentiment of brotherhood must be generated on the largest scale, and must become a vital source of sympathy and justice between nation and nation and race and race as time rolls on.

It is needless to quote the signs of this fresh and most luxuriant growth of geniality and cordiality observable in the newspaper literature of Europe and

America; in the new codes of law; in recent diplomatic intercourse; and even in the conduct of war. It is a great reality; it will become a still greater reality. It already hinders mutual wrong and destruction. It must in time bring in an age of at least comparative peace and beneficence. As it sinks deeper and deeper into the minds of men and spreads from province to province and from nation to nation it will surely quench the quarrelsome instinct of humanity and realize the teachings of Jesus. Whatever be the fate of creeds determined by other causes, no creed can live in the future unless it drink of this water of life. However stubborn the barriers of language, they must all sooner or later open their gates to admit one element of language common to all: terms of universal fellowship and good-will, of common interest and mutual sympathy. As Comparative Mythology is destined to re-adjust the theology of the world, so Comparative Ethnology is destined to re-adjust the international morality of the world, on a basis of its stirpal community of blood, and by virtue of a virtual identity of manners and rights, amply illustrated, and everywhere proclaimed and understood.

The past history of the race however will be potent for the production of future events; and the present geographical distribution of races and languages and religions and governments must largely determine the succession of changes which future historians will have to record.

The first great event of the future will be the taking of Constantinople. Twice already it has shown itself to be the lock on the door of history. Twice the key has turned and fate passed through. When Constantine transferred to it the imperial throne, the Western world died under the blows of the northern barbarians. Taken by the Turks in 1453, it sent back life to the Western world; but the Eastern world sank to its present condition of extreme senility, poverty and wretchedness. Taken by Austria or Greece in the next century, as it is sure to be, when the present strain of European diplomacy snaps at the touch of the next

general revolution, the East will renew its youth like the eagle, and a new-world era will begin. Europe is like an angry boil on the earth's skin; it must soon burst; and then it can heal; and the fever of the surrounding world will abate, and health be established. As long as the mutual jealousy of European nations burns, the Turk and the Arab can prevent the advance of civilization.

When one contemplates the site of Byzantium, one comprehends the jealousy of London. Here the Eastern and Western worlds meet. Towards this centre of three continental areas of infinite fertility flow the Rhone, the Nile, the Danube, the Dnieper and the Don. A wise government established here must absorb Austria and Greece, European Russia, Asia Minor, Syria, Arabia and Northern Africa, and hold in check Italy, France and Spain. But the wise government of the future will be just and benevolent. The absorption will be confederative; the centralization representative; the process peaceful and peace-assuring; the consequences—a revival of agriculture, the restitution of woodlands, the amelioration of desert climates, security for trade, the expansion of commerce, the reformation of nationalities, and the restoration of the glorious Eastern World. A hundred years may bring, a thousand years will not be too long to wait for, the consummation of such events.

Sociology is the science of Human Society, as based on property, its manufacture, and its transfer from hand to hand.

This science wears two faces, the one historical, the other theoretical.

Historical Sociology ranges with Ethnology, Mythology and Philology, as a critical statement of the basis, form and fruits of human association, in the family, in the clan, in the tribe, and in the nation. It states the facts as far as they can be learned; investigates the causes of these facts; and compares, contrasts, classifies and infers from them what is probable and possible. Theoretical Sociology on the contrary ignores in

great measure the past procedure of the race and endeavors to devise the best methods for constructing human society out of present materials, in present circumstances, leaving future generations to care for their own associations. In this aspect only does Sociology expose itself to the oft-repeated and damaging charge of not being a science, but only a trade.

Nothing is recognized as science which excludes experiment; nor can any science produce generalizations acceptable as laws of nature if it take not cognizance of the whole range of recorded experimentation. Sociologists degenerate into fanatics unless they make their science *comparative*; studying the whole past in close connection with the whole present social life of the race. Society has been an experimental kind of existence from the beginning, and is so still:—experiments in manufacture, experiments in commerce and finance, experiments in law and government, and experiments in war. And these experiments have been tried so repeatedly, under such various circumstances, and with such long trains of serious consequences, that it is idle for any theorist to think himself a statesman unless he be well versed in the social history of ages gone by. For the ages gone by have begotten the age we live in, and the essential qualities of mankind do not change with the changes of surrounding things. New powers are offered to man for his service; but man will always take advantage of enlarged facilities for accomplishing his same old favorite purposes. Through all time his main occupation will be handwork; his chief aim, accumulation; his most valued pastime, government; and his fiercest passion, war.

But handwork, with or without machinery, has for its main object the production, employment and accumulation of property; government is chiefly concerned, when once life and limb are made secure, with the regulation of the ownership and transfer of property; and war would lose all zest were there no property to be seized or destroyed.

On *Property* therefore Human Society has always been erected and maintained. As the question: *What*

is *Property?* governs the current of events, so the question: *What will be considered Property when all the world is civilized by education?* must receive some definite answer before a prophecy of Human Destiny can be imagined.

The first postulate in the theological story of the universe is the eternal reality and value of property. The first assertion is that God owns the world which He made, and therefore can do what he likes with it.

This theological maxim has been encased in the corner-stone of the foundation of every edifice of humane society.

Savages and civilized agree that to create is to possess; whether it be a tool or a weapon, clothing or ornament, hut or canoe. In early times, a wife was captured property, a child personal property, sacred from all other claimants. The only limitation to this law of personal property sprang from an indispensable community of action. What could be made or got by the man alone was his own. What could be made or got only by the family as a whole, was owned in common by the family; but by no other family. What was only attainable by the joint efforts of a tribe was the property of the entire tribe. Polyandry obscured and extinguished the individual ownership of the child; and then the eldest brother, as head of the house, became the master of the lives and fortunes of all the children, whether begotten by himself or by his brothers. The fruit of the chase, in which all shared, was partaken by all; and the fruit of the soil, which all tilled. Hence savage tribes still hold land *in commonalty*; and the worst feature of this mode of tenure, the encouragement it gives to laziness, is the strongest popular argument with civilized nations in favor of ownership *in severalty*.

But this very argument for the several ownership of the land which can be divided, and of the fountains, running streams and coast lines which can be defined for fishing and milling purposes, is of no logical value except so long as it stands upon the original ground of Use.

To the savage tribe it is all-important to define and defend boundaries; because expatriation on the one hand and invasion on the other, means for them either annihilation or enslavement.

For the civilized farmer, the landmark has the same value; it protects work and the fruit of work; that is, life and happiness. But this its main function is of course limited to the homestead and its vicinage; and cannot be justified at a distance. To remove the landmarks was a crime rightly cursed by Jewish legislation. But the wealth and enterprise of modern days has caused a far removal; in important respects indeed a necessary one; but in other respects most unjust and injurious.

Absenteeism, a social disease of the new order of things, demands a wise and skilful diagnosis, a careful and benevolent treatment. Surely it must some day obtain both. But the day seems far removed; for, what with changes of government; the general increase of population; the expansion of trade; the multiplication of industries; new inventions in the mechanic arts fostering the growth of cities and the immigration of provincials into these; the location of continental railways branching in all directions; the development of innumerable gold, silver, copper, iron, coal and oil regions and the transference to them of homeless multitudes; the flow of emigration into newly discovered areas of the earth's surface; and the general intermixture of families, tribes, nations, and races, still clinging to their only half-abandoned claims to old possessions while inaugurating claims to new—*Absenteeism* has seen its opportunity and seized it with a vigorous grasp. It has changed its form, and with that its name. It is now *Monopoly*.

Yet Monopoly is not an evil; only subject, like other things, to the risk of becoming evil. In this it differs from Absenteeism, which is almost wholly evil. Monopoly is the return of civilization to take up the savage code of ownership in commonalty, without purging that code of what is unsuitable to civilized ownership in severalty. Instead of, as formerly, the tribe at war

with every neighboring tribe, we have now the company in competition with every other company. Instead of a contest with bows and arrows, clubs and spears, ambuscades and hand-to-hand battles, we have log-rolling in the legislature, intrigues in the directors' room, sharp practice at the bar, and the bulling and bearing of stocks on change.

The popular cry against Monopolies is a mistake; for, as the drainage of a continent requires great rivers, and the rains collect into lakes and seas, from the evaporation of which the continents are again blessed with fertilizing showers, so, private wealths combine to form accumulated capital, by the which entire nations of working-men are provided with various work. And capital must be administered. And administration requires service. And service to be efficient must be made responsible. And the most stringent sense of responsibility is that of a man to his own interest. Power when distributed among many loses force by losing directness; when placed in the hands of one or a few it becomes quick, straightforward and efficient.

The monopolies of the Middle Ages, and of the Orient of the present day, were and still are iniquitous compacts between tyrants and their tools, for fleecing the people. Farming out the taxes has reduced enslaved nations to wretchedness and kept them wretched. The salt and grain-grinding monopolies, once in vogue, deserved all the execrations they received. But a government monopoly of the sale of tobacco is a blessed mitigation of despotism.

There remains under modern constitutional governments only one monopoly which perpetuates the system of bad government now so fast passing away — the monopoly of land by hereditary descent.

France relieved itself of this load by the great revolution of 1789. Switzerland threw off the same load gradually, in her long struggles with Austria and Burgundy; but is not even yet entirely disencumbered. All the other countries of Europe groan still beneath its weight.

In America alone, the land, like air and water, is as

yet too plentiful to be appreciably monopolized either by government, by privileged classes, or by individuals. But the spirit of land-monopoly works even in the United States, and produces evils here and there, petty in view of the woes of other times and lands, but prophetic of future danger. Bred of the old delusion that he who does not create can nevertheless rightfully own, it exerts its subtle influence upon all the legislation of all the united states; and nothing but the fresh energy of new ideas, nothing but the counteraction of a wise and good public sentiment, will avail to save us as a nation from a future destiny which shall repeat the horrors of the past.

The popular sentiment in America, however, is sound at the core. It affirms silently, if not openly, that Absenteeism is not monopoly in the modern sense, but monopoly in the sense of the dark ages. Americans permit it to live and work, but watch and limit its activity; tax it heavily; and hamstring it effectively by forbidding its entail. The woes of Ireland issue from the womb of an *entailed absenteeism*. The prosperity of France is wholly due to the various effects produced upon the character and habits of the people by the *enforced equal devisement of land to all and each of the surviving children*. Despotism is impossible without an aristocracy based upon an hereditary close entail of land,—either an aristocracy of title, or an aristocracy of money, or both. The iron despotism of England—the least free of all civilized countries for the multitude—is upheld by the power of this prerogative of the peer, reinforced by the same power and prerogative vested in the capitalist. The Irish landlord lives in London; his banker in London pays the troops which guard his land in Ireland. The Common Law of England (called “common” in a sarcastic sense) declares that he *owns* that land in Ireland. The Irish tenants rebel—not against government, but against this idea. The whole human race—except the privileged owners of “real estate” and the lawyers, politicians, and soldiers, their retainers—the whole human race entertains the profound conviction, implanted by Nature

and cultivated by the experience of life, that *ownership* is based on *creation*, and confirmed by *use*, alone.

The destiny of man is to prove this conviction to be true, and to illustrate the truth of it in the future.

Will it be accounted illogical, if I say that the so-called Monopolies of our day, at which self-styled democrats and socialists bay, like dogs at the moon, are among the first of these illustrations?

Let us see.

The genius of our age is the spirit of mutual association for the promotion of a common interest. It organizes society in a thousand ways so as to combine its particular individual forces for greater efficiency, interweaving a thousand twisted threads of wisdom and energy into one fabric.

Relieved of autocracy, that vain substitution of a local god- and father-despot whose sceptre and sword should answer all demands of law, justice and benevolence,—relieved of oligarchy, that equally unsuccessful makeshift for a nation's self-keep and self-culture,—human society is now free to assume the reins of its own government, to provide for its own wants, to regulate its own conduct, to cure its own harms, to select its own paths to prosperity, and to forecast its own destiny.

The first stage of the new adventure is that of *Consultation*. Knowledge of the situation—the whole situation, within and without,—must be gained first.

And the first business to be attended to is the *taking an account of stock*; estimating the resources at human command for accomplishing needful human work; debating and distinguishing between the needful and the less needful, the useful and the agreeable, the desirable and the attainable; stating the amount and quality of raw material; the efficiency of the machinery by which it can be converted to use; the means of transportation; and methods of distribution, where the supply is demanded. And this as regards not only the feeding, clothing, housing, and warming of the body, but the enlightenment of the intellect, the rectification of the will, and the ennoblement of the heart—for each and all—also.

The second business to be attended to, is the *adjustment of property*. Modern society is essentially democratic. The Divine Right has descended to all. The old idea of the clan, or tribe, or gens, has been expanded to fit the entire nation. There must be a distribution of work, and a distribution of the proceeds of work, to all. He that works much must get much; he that works ill earn little. But the wages must be proportioned to the work. Whether the work be invisible or visible, skilled or merely manual, for the craving necessities or for the no less craving imaginations of men—the work in any case must be justly estimated at its true value to society, and be rewarded with a just amount of *ownership in real estate*,—not necessarily in *land*, but in *whatever is real in the estate of the owner*, whoever he may be, working under the divine inspiration of a desire and a hope to own. And the same legal safeguards should be thrown around “personal property” so called, that are so sedulously drawn around what improperly arrogates to itself the exclusive title of “real estate.”

Consultation upon these two subjects of universal interest was not feasible until the commencement of the present century. Kings could consult upon their own affairs, but not the people. Even merchants and bankers found it difficult to consult. Armies were lost for want of means of verbal communication.

The discovery of the power of steam, and the discovery of the galvanic current,—the inventions of the steamboat, the railroad, the newspaper and the telegraph—were trumpet notes of invitation to mankind to meet in convention to revise the Constitution of the Commonwealth. Slowly but surely all classes of men in Christendom have answered the call. They are now in session. The convention has a quorum of millions. There is a committee on every subject of necessity or interest to any class of society, however small. They sit *en permanence*. They report at pleasure. They elect to fill their own vacancies. They appoint their own chairmen, secretaries, and treasurers; frame their own parliamentary rules; meet

and adjourn in independence of each other; have their several committee rooms; keep their own private and publish their public records. Nothing private is long concealed. The committees know each other's debates and pass judgment on each other's resolutions; debate again and again and resolve accordingly.

These committees of the general convention of civilized communities are all well known to you, by name, and character. They are the Trades unions, the Boards of brokers, the Institutes of Mining, Civil and Mechanical engineers; Astronomical, Meteorological, Physical, Chemical, Mineralogical, Geological, Palæontological, Botanical, Zoölogical, Historical, Archæological, Philological, Statistical and Geographical societies; the Cobden club, the Iron and Steel association, the Free-trade league, the Land league; Boards of trade and Merchants' associations; the Society of the Cincinnati; Army clubs, Literary clubs, Political clubs of all kinds; Scientific congresses, associations and unions in every land; Health conventions, Prison discipline conventions, Political caucuses and conventions of every size and shade of opinion; Freemasonries of a dozen names; Religious conventions by bishops, by presbyters, by laity of every order and doctrine; Railway, Canal and Mining companies, and Bureaus of government, with statistical, agricultural portfolios no longer held by the lords but by the servants of the people; no longer busy with plans for destroying the peace of the many for the sake of the ease of the few, but collecting and distributing the knowledge of what is good to all, that all may obtain some fair and reasonable share of it.

This new organization of civilized society resembles the old organization of semi-civilized society as a man awakened to the exercise of brain and nerves and muscles resembles a man with the powers of thought and motion still locked fast in slumber. The organic nature of mankind has always manifested its ability for performing the functions of amity and comity on a small scale, in the sphere of the family and the clan, where intercommunication and mutual intelligence are

comparatively easy and simple, and within narrow geographical limits defined by the physics of human existence. Now, that physical disabilities are so abated or removed, intercommunication of neighborhoods and provinces with one another and of whole nations with one another has become swift and facile. The old barriers are thrown down; the seas are bridged, the Alps are tunnelled; lightning and news are synonymous terms; language alone remains forbidding; and even this last barrier is being removed by the resolutions of the World Committee on Education. International conventions are the order of the day. International expositions of the industries of all nations explain to the eyes and minds of all peoples their common interests. Thousands of millions of letters and postal cards fly and fall like snow upon the globe, covering, warming and moistening the soil of the coming springtime of history; the seed in which is Christianity; and the harvest must needs be Peace and Plenty.

The Isis of man's destiny has dropped her veil. Lo! we suspected the worn face and streaming eyes of the Mater Dolorosa. We behold instead the radiant countenance, full of wisdom, energy and benevolence, of the Dresden Madonna; and in her arms sits the regal boy, the thoughtful, planful, powerful Horus-Christ; just waked from the dreamful slumbers of a millennial night, to enjoy a millennial day; the observant spectator of his Father's work.

LECTURE XV.

THE FUTURE ECONOMIES OF MANKIND.

I HAVE said that the common social life of the world is represented in four ways:—1. by Manufacture, 2. by Trade and Commerce, 3. by Warfare, and 4. by Legislation.

How will the future declare itself in respect to these normal lines of conduct pursued by the human race, as it becomes more and more a unit? Let us take them up in order; and with the premise that they call for discussions on the nature of property, on the value of money, and on the art of finance far too fundamental and extensive to be more than suggested in this lecture.

In *Manufactures* the skill of man has exhausted itself. Evidently there are few materials left to discover which can be so important for the arts as the india-rubber gum, quinine, the black diamond, the Stassfurt salts, cryolite, and anthracite.

The modern house typifies the future, as plainly as the wigwam and mud hovel signifies the past.

Within the domain of luxury the manufacturing genius shall find its chief employment in coming ages. Universal comfort will be the watchword; for, comfort, once the expensive monopoly of a few, is to be the cheap abundance of the many.

Machinery is both the cause and the effect of comfort. What few demand, a few supply; and the supply is occasional, sparing, difficult and costly. What all demand is sure to be created abundantly, quickly, easily and at a low price; transported in quantities to

great distances; and stored in piles for general consumption.

No more exquisite gold work, silver work or glass work can ever be made than is exhumed from ancient tombs. But \$50,000,000 worth of finger-rings are now worn by the people of the United States. The grand duchess Margaret of Burgundy slept in a small stone room, with one low window, in the château of Dijon; sat upon a wooden stool; and dressed by a hand glass no larger than a window-pane. A cell in the Eastern Penitentiary is a fine place in comparison. The audience chamber of Queen Elizabeth of England was carpeted with rushes, not free from vermin; and the house of any mechanic in Philadelphia compared with her palace is a heaven of curious luxury.

Modern machinery is fast obliterating the distinctions of caste and class. When Steinway's, Chickering's and Broadwood's grand-action pianos are heard in secluded farm-houses, the old days of chivalry, with spinnet and cipher, have closed up their accounts with civilization; assigning their best possessions and long jealously guarded rights to the *canaille*. No chariot of Pharaoh or Emperor could compete for curious elegance or utility with either the English bicycle or the American buggy; no coliseum with a modern opera house.

What were the glories of Cleopatra's barge, or of the Bucentaur, in comparison with the splendid convenience of a Fall River steamboat, daily fitted out for the pleasure of any two thousand citizens who please to occupy it? The elaborately aristocratic post-chaise system of only seventy years ago seems rude and awkward now, in view of the democratic refinements of daily trains of palace, sleeping, smoking, dining, express and mail cars following each other in rapid flight and ceaseless succession across the American continent.

The application of steam to machinery, and of science to invention, has accomplished this; and therefore, since the power of steam is infinitely applicable, and since the multitude of inventors is always on the increase, the universal distribution of communal luxuries to mankind would seem to be merely a question of time.

It must also be considered, that in past ages war was habitual, cruel, and reckless of consequences. Every conflict was succeeded by the sack of cities, and cities were the only centres of manufacture. With the city, its artisans also were destroyed; and their machinery, poor as it was, perished in the same ruin.

Now, on the contrary, wars come rarely, rage fiercely but locally, destroy little, spare carefully, and, so far from belittling, actually enlarge and invigorate the sphere of the arts; and modern manufacturing establishments, placed rather in the open country than in cities, escape instead of inviting destruction.

The *Finance* of the future — what will it be?

That must depend upon the future reconstructions of social ideas of property.

In past times, the task of collection and expenditure was simple, if not easy: collection by force, and expenditure at will. Absolute power, based on the right of the strongest and on the loose aggregation of the millions, took what it pleased, or could get, and spent upon itself and its favorites. The lord owned everything and was accountable to no one. The tax-gatherer compounded with the monarch for half the imposts, and often lost his half, now to the unscrupulous despot and now to the enraged and despairing mob.

At length the necessities of the throne established the right of the commons to initiate appropriations for its maintenance.

Finally, democratic revolutions formulated the prescription "No taxation without representation" — so far as freeholders of the male sex were concerned.

Republican government has resulted in the popular criticism of all appropriation bills not only after but previous to their passage; and all such bills are referred, not to the Executive, but to a standing Committee on finance.

It seems likely then that in the future every separate interest of society will have its weight in determining legislative financial enactments; and that a just balance of all interests will be represented by a frequently mod.

fied but generally consistent system of internal taxes and foreign imposts, lightening the burden of expense for each by equally distributing it over all.

But a struggle will always be maintained between the direct and indirect methods.

Before social interests became so involved with one another as they are now, and when individuals and guilds and single communities maintained a strict and jealous individuality, having little intercourse with one another, each standing squarely face to face with the ruling power, the personal property tax was the simplest, quickest and most forcible method of taxation. So, the purist still admires the *income tax* for its directness and simplicity. But business men universally prefer an *impost* on the fruits of industry; because that method of taxation raises no embarrassing personal questions. Moreover, losses which are not noticed are not grieved over; and poor people, receiving no tax-bills, suppose that capitalists and landlords alone support the government, and are seldom roused to inquiry except at crises when house expenses exceed wages. Even then, far from comprehending that both prices and wages are regulated partly by taxation and partly by the balance of supply and demand—they lay the blame vaguely upon capital in the abstract, and not upon any precise misappropriation of capital for unnecessary or wasteful objects.

Even should a universal better education of the multitude hereafter avail to clear men's vision for a real understanding of the complicated finances of human life—which is very doubtful—the hope of the future must rest upon a breed of honest experts, whom the people can trust, and to whom they can delegate the power to tax. The education of such a class of experts may perhaps be hoped for; but it will manifest two opposite tendencies.

There must always continue to be two schools of financiers—one more theoretical; the other more practical; both relying on masses of statistics; both arguing from different stand-points. The more theoretical

will strive to realize transcendental ideas; the more practical will strive to arrange interests as exhibited about them.

This native divergence is the first distinction between free-traders and protectionists. The former starting from the universal idea of human brotherhood, and the latter starting with the necessities of their own home and country. The former pursue the argument with a conviction that what is good in the long run for the whole must be good for each part; the latter confessing ignorance of what should be good for the whole, confine their intellectual activity within the scope of actual knowledge of what is beneficial to a part.

Other elements of strife intrude. The commercial class (technically so called, as opposed to the class of traders) resist by instinct all imposts upon foreign goods, and desire to throw the burden of an excise tax upon home productions. Especially is this true of the very large class of really or virtually foreign merchants doing business at American ports. Their interests centre in foreign lands, and they naturally wish well to foreign manufactures. Their wealth is great, and their efforts to influence home legislation are skilfully directed. Aliens at heart, citizens only in name, and by accidental or temporary residence, their financial philosophy leans as much to one side away from the truth, as do to the other side the financial propositions of those who would gladly support the government (if that were possible) by the exclusive taxation of foreigners to the complete relief of its own citizens.

Between these two extremes ranges the line of theory and practice called "Protectionist"; seeking to impose only such a tariff upon foreign goods as shall result in founding and making safe and permanent all kinds of human work on its own soil; so that competition shall take place only between the equally liable subjects of the home government, and not between tax-payers represented at Washington (for instance), and foreigners whose conduct cannot be checked in London, Paris, or Berlin. A high tariff, at its first send-off, certainly enhances the price of manufactured articles at home.

But experience shows this to be a temporary inconvenience; for, as soon as any manufacture is fairly introduced and extended, competition with itself brings down the price nearly to a par with the foreign article. And if a difference still remain, that difference really represents a higher rate of wages at home, and a better profit on the raw material produced at home.

But, apart from the question of price, Protection to home manufactures meets a capital demand of nature: that every nationality shall take proper steps for equipping itself with all the powers, and furnishing itself completely with the whole apparatus of civilization. Evidently, this cannot be effected so long as foreign nations are permitted to feed or clothe or build or make for it anything that it really wants and can accomplish for itself.

Any advancement of the human race in wisdom and goodness must result in the general spread of the virtues of temperance, diligence, honesty and thrift. Any accumulation of the popular wealth in the hands of all, must render working men more independent of their employers and tend to co-operative industry. This in its turn will settle wages according to the law of supply and demand; and, finally, the right adjustment of both wages and profit in associated trades will arrange prices. There is a real price and there is a fictitious price for everything. Its real price is the average money which would be offered for it, say by a hundred thousand ordinarily intelligent people. Its fictitious price is what it might occasionally command as bric-à-brac, or as a souvenir, or from a capricious, eccentric, or extraordinarily wealthy person.

The natural price of a manufactured article is determined by an estimate of the expense of its manufacture: 1. So many minutes, hours, days, or years of the maker's life + the cost of the raw material and tools + the expense of exposing it in its proper market + an average percentage of unemployed time between the finishing of it and the undertaking of another job + a percentage of the hours of enforced idleness in old age, during which the workman must be supported from the profits of his life + a percentage.

His education as a child and for the workshop is not counted as a separate item, for that comes into his father's account, and regulates the prices of the last generation. But the education of his own children and all other home expenses taken together determine the value of the first element of the calculation. If it cost a workman \$1,000 a year to live, as husband, father, citizen and christian; and if he can accomplish 6 good hours of work in each of 300 days in the year, for 40 years, in a life of 70; then from $40 \times 300 \times 6 = 72,000$ hours of work he must get \$40,000 worth of prices over and above all expense of material, tools, shop and transportation; making each theoretical work-hour worth to him *at least* \$0.55. Commencing at 20 years of age and working until he is 60, he must provide \$10,000 more for the remaining 10 years of his life, if his home expenses continue to be the same to its close. This will make his work-hour worth *at least* \$0.79. This supposes him to have no interruption in business for forty years. Supposing interruptions to the extent of 20 per cent.,—the worth of an hour then rises to \$1.00.

If by the abundance and low price of food, clothing and materials he can support his family on \$500 a year, the *natural first price* of his manufactured article will fall to \$0.50 or to \$0.40 *per hour required for its manufacture*. But every indulgence he allows to himself, to his wife or to his children, will enhance the price he must ask for his hour's work. Every delay in his arrangements, every detention by a customer, every piece of spoiled work, every loss by accident, every play of his invention, every change of model compelling new calculations or new tools, increases the natural price of his working hours by diminishing their number.

This is the explanation of the supposed stupidity of mechanics who obstinately refuse to depart from their rules of thumb to gratify the caprice or the intelligence of their employers.

The estimate given above is based on the American idea that the man supports the woman by his labor, and that the woman earns nothing by her own labor,

being wholly and always occupied in household cares. On the basis of French ideas — a basis far sounder and more stable in the nature of things, to which all nations have been brought down, and on which the American nation also in the course of time will be forced to arrange its affairs — the woman, sharing the work life of the man, shares in the profit and loss account of its finance. The wife works with the husband in the field and vineyard, in the workshop and office. Thus the family time and strength is doubled, and the woman who cannot earn as much as the man does more to save earnings than the man. On this basis, with this thriftiness, the cost of living is reduced to one-half, and the cost of all manufactures falls to one-half; because raw material is itself a manufacture in the first stage, and its cost is reduced first. If the American married man's hour be worth \$1.00, the French married man's hour is worth only 50c. But on this half-pay he and his live wiser, better and happier than the American family lives on double wages.

I have no opportunity here to discuss the complicated mass of consequences deducible from this principle. But it is easy to see that however machinery may cheapen comfort for future generations, hand-made or brain-made luxuries must in all future ages continue to be the private enjoyment of a favored few, or else be owned in common and arranged in public places. Private cabinets must give way to public museums. Libraries of rare and costly books must be thrown open to all. The gardens of the rich must be combined to make public parks. Luxurious symposiums must be replaced by municipal festivals. Railroad shares must be held in small blocks.

This change however has already made its mark upon the century in which we live. The tendency to a more complete realization of it, in the shape of comfort at home and luxury in public, is a strongly pronounced feature of human destiny while yet that destiny is merely a child of the future.

The item of *Interest* was not included in the list of price-data given above. There is a destiny for this

fiction of Interest, also; and its destiny is to vanish away out of the calculations and the life of men. It is no arrangement of Nature that a baby should be born heir to an accumulation of the ownership of the saved products of a million days' works of other men through the cunning procedure of his father (who in his lifetime did no more labor himself than any other man), and be thereby invested by legal enactments or society regulations with the right of living on the "Interest" of that accumulated "Capital" his whole life through, and that without doing any work at all himself.

"Interest" reveals its true character when it throws off the mask of moderation, and appears then with its natural face as "Usury." The reason why all enactments against usury have been acknowledged failures is the ground fact that there is no natural distinction between usury and interest. Man was born to work, and to save from the proceeds of his work a penny for a rainy day. Most human beings find no loophole of escape from this divine ordinance. Some however do escape; and the efforts of others to escape makeup the history of rapine and fraud. Historians know that the greater part of the past legislation of mankind has really been for the application of physical force to the legalization of rapine and fraud. The effort of the present generation is to rectify legislation in the interest of honest labor, to protect it from the prescriptive claims of rapine and fraud, formulated in the statute-books of bygone generations.

The worst feature of the system of *Interest* is not its theoretical unnaturalness, and the opportunity it affords for hereditary idleness and uselessness, but its practical side-effects in establishing a broad foundation for non-hereditary idleness and uselessness combined with noxious profligacy and wasteful private luxury. The imitation of the habits of those born rich and of those living on incomes incommensurate with the amount of work which they have accomplished, by a large class of youthful human beings, whose only wish and endeavor is to repudiate their indebtedness to those who work

for them, leads to this consequence: that the prices of all articles of consumption are enhanced to the honest on the business principle that "bad debts" on the ledger of the manufacturer must be balanced by increased profits. Every idle man must be supported by the workers of the world. Every non-producing family adds to the expenses of producing families. Every unpaid debt increases the price of food, clothing, house-rent, and furniture to the whole community. The habit of drawing interest on money lent is the first cause and continual opportunity of the production of drones in the human hive; and its abolition will be one of the most necessary and one of the most difficult of all the tasks of the future.

The abolition of Interest will probably be hastened by the change going on in men's regard for women. Hitherto they have been men's property, carefully guarded, and forbidden to work at any trade but that of serving and pleasing men. This made one sex—one half of every privileged class—one half of every highly civilized community—drones. So long as men worked only for a shelter from the cold and for sufficient food, women's house-work equalled and balanced man's shop-work; the shop was the house, and the woman and the man being constant companions fell naturally enough to share each other's employments. In planting and reaping and tending cattle, they worked in common. And this is the case still with the most of human beings. But as certain individuals and classes became distinguished from the multitude by luxury and superior refinement of manners, certain women ceased to work at useful tasks and betook themselves to embroidery and such like fanciful and useless occupations. As "Civilization" spread, and men's wealth increased, the female sex acquired sentiments and habits of absolute dependence and physical inefficiency. Their maintenance devolved wholly on working men. In our day and country, now that men consider women their equals in all the rights of life except the right of a separate and independent selection of work for themselves, and a separate and inde-

pendent ownership of its proceeds, the extra comfort and luxury in which men love to see their women live, doubles or quadruples the severity of male labor, and the cost of family maintenance. Hence the growing number of unmarried men. Hence the multiplication of abandoned women. Hence the increasing difficulty with which lone women sustain life. Hence the revival of woman's desire to share in man's labors. Every male trade is besieged with female applicants. In course of time, some readjustment and return to first principles must be inevitable. Useless work will be eliminated from the business of the human race, and men and women, together or separately, must occupy their minds and hands only with what is useful. The proportion of drones—now nearly fifty per cent. of the whole population—will fall to 30, 20, 10, 5 per cent. Production will rise as idleness declines; and the cost of living will be abated for each male and female worker, first by the surplus of work done, and secondly by the lessening of the number of drones to be worked for.

But, by this general distribution of moderate means to all, the accumulation of an undue amount of the symbol of work (money) in the hands of the few will become more and more difficult and exceptional; while a universal and traditional industry will gradually metamorphose the fiction of Interest into the fact of Dividend.

Interest and *Dividend* are contrary terms. For, whereas Interest represents an artificial system of usury, Dividend represents a natural system for distributing the proceeds of labor. It is needless to illustrate this further; it is the key to the future Social Science. Its present symbol is the Mutual Savings bank, even complicated as that still is with the fictions of Interest on money lent; but the symbol in this form of it will be exchanged for the better forms of the Building association and the Co-operative store, in the just operation of which Money makes its nearest approach to an identity with Work.

Money.—This mystic word is destined to a fair illumination.

Aclergyman of Philadelphia is said to have collected 16,000 books on the one doctrine of infant baptism. When Stephen Colwell died, he left to the University of Pennsylvania 9,000 separately bound treatises on Money.

Why so many words to explain what everybody comprehends? It costs the farmer a day's work to get a bushel of corn out the soil; and it costs a basket-weaver one day's work to make a bushel basket to put it in. *Barter* means that the farmer shall exchange his bushel of wheat for the basket; and now the farmer owns a basket *for* which he has wrought, and the basket-maker has enough food for his household until he can make and sell another basket.

But Bartering is impeded by a thousand inconveniences. A pledge from the farmer to deliver the wheat when the basket-maker wants it will save both of them from inconvenience. A piece of gold or silver stamped with a mark which all farmers and basket-makers have agreed to mean "one day's work" and which is known by the name of "Dollar," will enable the transfer of wheat and basket to be made at any future more convenient season. A piece of leather, or paper so marked and so recognized will do this as well. But in the case of gold and silver the money (of such and such a weight and size) represents also itself a day's work, and its circulation is therefore of the nature of barter; but in the use of a leather coin or a paper dollar, thousands of which can be made and stamped in a day, the barter is confined to the goods, and the money is a mere promise to pay. In the case of gold and silver coin, the buyer and seller both know that the whole human race will recognize, comprehend and help to realize the contract. In the case of paper money, the buyer and seller have no guarantee beyond the genuineness and local reputation for honesty of the name upon the note. Facilities for forgery and breach of trust are infinitely greater in the one case, therefore, than in the other. If, however, these facilities can be taken away,—so that the barter can be made as safely and surely with the paper dollar as with the gold

dollar,—then the nature and value of the one is precisely the nature and value of the other.

To do this is precisely the object of every national bank system. Banks are but larger individuals, and when they deceive, multitudes are wronged. The government steps in to guarantee the multitudes against deceit. If now the government itself becomes fraudulent, the whole nation must suffer, and without redress.

Irresponsible governments have done this a thousand times. The overthrow of many a government is attributable to no other cause. When the late Pope debased the Roman franc ten per cent., Napoleon's policy being then to protect the Pope, the bank of France accepted the circulating coins at their face value; but when Napoleon's policy changed and the French brokers would receive the debased coin at only its real value, the French peasantry, then discovering and fully appreciating their loss of two sous on every franc they hoarded, attacked the priests, and yielded themselves to a mad delusion that the Pope had moved the Vatican to Germany and instigated the invasion of France. From the moment of that fatal discovery the prestige of the Catholic religion was broken down throughout the kingdom; and the present republican and anti-clerical majorities in the Corps legislative are a logical consequence.

Every—the slightest—shade of dishonesty cast on the monetary transactions of a government darkens the moral and social atmosphere of the nation, even when the government is unconstitutional. Much more disastrous are the consequences of fraudulent dealing openly enacted by a representative government, for all the acts of which the whole population of the republic must needs feel itself responsible. The debased coin of the United States is nothing else than the ugly reflection which the debauched business conscience of the nation sees of its own face in the looking-glass of its National Congress of law-makers. Still worse is the issue of legal-tender notes which violate the fundamental principle of money by carrying no guarantee.

Geology has no prediction to make respecting the future exhaustion of the precious metals. Even if this

be engrossed in the schedule of events its date cannot be calculated; because, the innumerable gold-washing places of both hemispheres indicate an infinite number of as yet unworked auriferous quartz veins; and, new argentiferous regions of extraordinary value are among the most recent discoveries. Refinements in metallurgy will come to the relief of deep mining; and, better chemical processes will diminish the waste of gold and silver in the arts.

To all this must be added the probability of a more general prevalence of peace; the easy multiplication and preservation of gold and silver work in private and public edifices; and that cessation of the ancient and universal practice of hoarding, by burying coins in the earth, which, first in one country and then in another, will be the natural result of the introduction of a system of paper currency, under the guardian care of stable and enlightened republican governments established throughout the world.

There seems no reason to doubt that the supply of the precious metals will always be sufficient for the trade and commerce of men; and all the more because due bills, bank bills, and bills of credit will be more and more in demand, relieving coin of risk of transportation, and in fact of every function except that of petty exchange; while the perfection of telephonic and telegraphic communication will make the transmission of paper money itself to some extent unnecessary.

The future *Commerce* of the world is a theme too vast for even a fancy sketch. Carriers of goods on foot, on horses, asses, camels, oxen; in bark or hide-canoes, which men could lift out of one river and carry over to launch in another; in coasting-boats, hugging the shore from headland to headland; or in vessels with sails, piloted by the stars—merchants of the desert, of the mountains, of the islands of the sea—appear at the earliest dawn of history. In all subsequent ages some kind of commerce flourished wherever there were human beings. Amber, nephrite, the turquoise and the pearl, gold torques, bronze swords and chunks of

iron established its early routes. Rock salt and textile fabrics have been its principal burden. The discovery of any unknown land was always followed by the building of new marts upon its coast, the spread of manufactures and the building of fleets. The central sea of the world became a theatre of commercial competition, war, and piracy. The products of Europe, Asia and Africa were brought by caravans to its shores. India and China traded with the eastern archipelago. Even the mound-builders of America had their general trade in Lake Superior copper and North Carolina mica, which wove the interests of their tribes together, and produced a feeble civilization, destined in the end to be extinguished by the power of the red Indian, as the civilization of southern Europe and northern Africa and western Asia had been by Skythic, Teutonic and Saracenic invasions.

Trade is the local exchange on equal terms of one man's works for another's.

Commerce is the transportation of cheap goods from where they are superfluously abundant to distant places where they are scarce and rare and highly valued.

Trade involves no profit except such as represents the deficiencies of a man's livelihood. The parties in trade have an equally good knowledge of the worth of the things bartered, and in the end come out square with each other.

The parties in commerce were never (until lately) on equal terms, except in one respect: to wit, there was no true knowledge of the worth of the goods on either side; the whole transaction was done in the dark. The buyer could know neither the price of the goods at the place they were made, nor the cost of their reaching him. The seller knew their prices where he got them, but could neither calculate his own expenses in transporting them to the place of sale, nor what the buyer there would imagine them to be worth. Hence all commerce was a pure adventure, and had the charm of a gambling risk; and all commercial negotiation was a slow and cunning haggling over prices between the merchant and the citizen.

In Oriental countries, this essential character of Commerce has bred its like in trade, and not an article is bought or sold, even between two people in the same village, without the formality of a negotiation respecting a pennyworth, worthy of some transaction of the Rothschilds, or the cession of Epirus by the Turkish government to Greece. Even in France and Germany, travellers are astonished by the universal fact that a price for every article on sale is at first demanded higher than the seller will be willing to take in the end. Here, it is a mere traditional custom. But in the Orient it is the consequence of actual ignorance of the real price of the article in trade, both on the part of the seller and on the part of the buyer; and as there are no fixed values for goods, it takes time for the buyer to get the seller's lowest price, and for the seller to find out the buyer's highest.

This ignorance, due to defective general intercommunication, and the total absence of a general advertising medium, like the press, converts Trade into Commerce. On the other hand, in the great cities of the West, and among the more wide-awake populations of northern Germany, Belgium, England, and the United States, a perfected system of mutual information has converted Commerce into Trade; and it is surely written in the destiny of the human race that, as time rolls on, and the local exchange, the newspaper and the telegraph station get planted in every nook and corner of the earth, the home price of every article of human manufacture will be accurately fixed and universally published, and the sole business of Commerce will be to declare the additional cost of transportation, and then lapse back into Trade.

There are four principal methods of transporting goods: by wagon, by canal-boat, by rail-car and by steam or sailing ships. Trade by canal, and commerce on the sea, are exceptional. Trade on common roads, and commerce on iron tracks, take and must always take the precedency. There are very few parts of the earth's surface proper for engineering a canal; and a canal, when made, must be of great width and depth,

like the Erie canal between the Hudson river and Lake Erie, to play any important rôle in the commerce of the world. Even then, 10,000 boats will only carry 1,500,000 tons of freight at the rate of 2 miles per hour, the trip requiring about two weeks;* whereas, the New York Central railroad, which runs beside it, could carry the same amount in the same time, delivering it at the rate of 100,000 tons per day, but after a run of only one day. The cost of freight on the canal, however, is less than 3 mills per ton per mile, as against a cost of 7 mills by rail. The canal is therefore used for slow freight, grain, etc. and the rail for express freight and live stock. Railways, moreover, can be constructed anywhere, and the Pennsylvania Railroad Company alone now operates 7,000 miles of line. The whole mileage of railway in the United States is 40,000 miles, increasing every year. Along all these lines are innumerable stations, whence freight is distributed by horse and wagon to every hamlet and farm-house in the land; and the number of horses thus employed may be estimated from the fact that among the various crops of the United States the hay crop has the highest value.

The tonnage of England's commercial navy amounted in 1880 to 10,000,000; that of all other countries to 11,000,000. At the commencement of 1880 a tonnage of 430,000 was under construction; at the commencement of 1881 a tonnage of 695,000; indicating not only the future expansion of ocean commerce in the world, but the continued supremacy of the British Empire as a commercial carrier for the world. This cannot last forever; but it may last a long time. In course of time, the vast future population of the United States will require a commensurate fleet to export its products of

* The Erie Canal is 350 miles long, 70 feet wide and 7 feet deep, and can float boats of 240 tons freight. It reduced the theoretical time of freight from Albany to Buffalo from 20 to 10 days, and the cost from \$100 to \$10 per ton, at once, delivering it at the rate of 100,000 tons a day.

The actual use of the canal falls far short of this, for the total of all freight passed both ways on all the canals of Canada in 1880 was only 4,276,820 tons. In Great Britain, 4,700 miles of canal exist.

the soil. But the rapid growth of manufactures in America will more and more confine the consumption of meat and grain within its borders. The wealth which England seeks abroad America will find at home. Internal trade will be a substitute for foreign commerce; as it is in China. Meanwhile the opening of the mouth of the Mississippi river is making of New Orleans a future rival for New York, and of St. Louis a future rival for Chicago.

Will *War* ever cease upon the Earth? is a question often asked and never answered. The prophecy of the second Isaiah, the glorious Unknown, was a sigh and a cry for peace for the Holy Land. But so long as children of Cain and children of Abel are born upon the same or neighboring soils,—these with the hereditary virtues of a love of peaceful labor and temperate thrift, those with a hereditary taint of laziness and greed—Fraud and Theft will cultivate the arts of Attack and Defence into the science of War.

As the classic government of force, Tyranny, has always been the eminent realization of organized and concentrated Theft, it can never exist but as both product and producer of War; and as both proof and example of the prevalence of the Cain element over the Abel element in any age and country.

Tyranny evinces also the insufficient education of the masses; for, as ignorance distinguishes the isolated and therefore unprotected individual from the educated and therefore united and powerful, the only protection for all is in the education and consequent close intercommunication and mutual acquaintanceship of all.

The spread of democratic ideas and the multiplication of republics result directly from the increase of popular intelligence, by which the real strength of the robber class gets measured, and the easy ability of the honest multitude to check and suppress schemes of spoliation appeals to the common sense of the nation.

Theft is essentially a vice of the night and of loneliness. In the light of day and in the midst of an active society, all crimes, but especially the world's habitual

crime, Theft, becomes too difficult. Popular education need not be technically *moral* to ensure a diminution of the rapine of kings and nobles, the spoliation of life and property by the cunning and reckless. When a people become well informed of all kinds of affairs they get into a condition to organize intercourse on a reasonable basis; to adjust the various claims of men on men; to tune and temper the great piano-forte of Human Society; to balance rights, and compress wrongs within the narrowest limits. Small communities, in which all know all, are necessarily better governed, or govern themselves better, than large ones. Religion has nothing to do with it. Morality is not in any sense the cause, but is the effect of it. And after Good Order follows naturally Peace.

Foreign interference is thereafter the only danger to be dreaded. Every ill educated, badly governed country is a standing menace to its better educated and self-governed neighbors. The great historical mission of the Republic of the United States is to illustrate these truths on a grade scale, and with exceptional advantages of time and situation. But Switzerland, Belgium, and now France, have also afforded fair and fine examples. Other nationalities are already inchoate republics, and will each in its turn realize the principle of general knowledge, a better order, and greater safety.

When a war is over, each soldier, after parading about awhile, making and listening to patriotic speeches, and getting back into the old routine of daily business, hangs up his rifle on its hooks, where it has leave to rust as a harmless memento of the past. So, nations will, in time and turn, put away their standing armies, when there are no more kings and nobles, but only artisans and tradesmen, scholars and physicians and artists left in the land; with here and there a thief, a sot or an imbecile, who will be cared for, each in a proper way.

When this process has been fully realized in all countries — those now savage requiring of course the longest time for it — it seems unreasonable to fancy the continual existence of War.

But meanwhile?

Ah! meanwhile, wars must needs recur; and every nation, not cut off from the rest by the ocean, must submit to military drill, and stand ready to repulse invasion. But is more than that needful? Probably the growing intelligence of Christendom will say *No*.

The experience of the Great Republic in the greatest of all wars has proved two things: 1. that all parts of a nation must be equally well educated if civil wars are to be avoided; and 2. that standing armies are not absolutely necessary either for attack or for defence.

The latter truth is enforced upon the consideration of the world by the powerlessness of the standing army of France in its last war. It was precisely the supposed existence of an efficient French army that occasioned that war; although its true causes were dated back in the times of Louis XIV, times of rapine and fraud *par excellence*.

A standing army represents enthroned rapine and fraud, whether on the steppes of Russia, on the plain of the Ganges, or in the bogs of Ireland. An army of volunteers is, on the contrary, the people; confederated under oath to remain a people, or to die rather than be enslaved. But such an army to be successful must be honest in its aims and claims, and educated by all kinds of work for all kinds of action. Given this, it scorns delays, disasters, sufferings and defeats; it knows itself invincible at last. Men who build locomotives, and tunnel mountains, and invent the electric light, and pipe petroleum a hundred miles, and hang steel bridges across Niagara, and transact their business by wire, and change their government with the regularity of clock-work every four years without disturbance, can on an emergency overwhelm their enemies with destruction, sink hostile ironclads with torpedoes, and improvise army for army as fast as their invaders approach.

If it be the destiny of the human race for all nations to become educated, enlightened, equipped with the apparatus of civilization, and exercised in self-government, then, it seems to be the destiny of mankind to attain to universal order and to universal peace.

But there resides in the very body of war the subtle

seeds of its own dissolution. For it is evident that the perfection of defence must in the end balance the perfection of attack, in military operations on a large scale. The improvement of arms of precision has already greatly widened the interval between forces in the act of conflict. This changes the sentiment of soldiers; which used to be a personal hatred, generated and intensified by frequent bayonet charges and musketry at close quarters. The brutality of cavalry movements is also lessened by the rapidity of breech-loading artillery-practice keeping off the approach of mounted squadrons; which are now detailed for other service. Sieges are no longer scenes of long protracted devil-revelry, permanently demoralizing whole regions. Vast fortresses require vast armies of besiegers; and when one or two capitulate, the war is over. It only remains to substitute nitro-glycerine for gunpowder to make destruction too terrible to be practised by reasonable beings.

Will the *Legislation* of the future be simpler or more complex—less or more vague—more or less operative;—more or less satisfactory to all—than it is at present?

To speak of the formal legislation of past ages is to talk of the imperious edicts of some conqueror, the arbitrary enactments of some oligarchy, or some rare and fugitive code of a casual tribal law-giver. But in fact mankind has always spent life under a double *régime*, the permanent and greater part of which has formulated itself in what is called sometimes Custom, and sometimes the unwritten Common Law.

Legal science recognizes this as the fundamental basis of all current legislation. Its principles are those of property in life, liberty to work, ownership of the proceeds of work by the worker, family duty and good neighborhood. Modern legislation occupies itself mainly in the writing out of this unwritten common law; codifying and commenting on it; simplifying and applying it to occasions as they arise; and providing it with executive sanctions.

The study of it enlarges legal science; and the prac-

tice of it supports the legal profession — a class of experts, who naturally gravitate, as lawyers to the courts of justice, and as law-makers to the halls of legislation. These experts in law are the arguers and deciders of all questions in controversy between man and man in respect of honesty and fraud; and between society and its members in regard to every act of crime. They represent the common law of all ages as interpreted into the thinking and feeling of the day and place. They are the voice of every class of mankind complaining of inconveniences or pleading excuses. They are the framers of all contracts and the detectives of all disorder; but not as inspired from without society, or from a higher source of wisdom and justice, but as society itself would do this, of itself and for itself, if it were not too busy.

Therefore, although Law and Justice are terms standing in the history of philosophy for the absolutely good in regard to the ordering of society, they are also and universally, in the actual life of the world, merely terms standing in the minds of men for the best social arrangements which they have become acquainted with up to date. Beyond this their meaning cannot reach. Beyond this lawyers cannot go. Yet, beyond this a certain percentage of law-makers are constantly striving to press forward — off from the ground of present usage, on to some surer ground of a more perfect justice and morality. These advanced men however can only proceed at such a rate as will permit the crowd to see and follow them; and the lost prophets of legislation have been leaders whose rapid pace in advance of their times carried them out of sight.

Our word *morals* is the Latin *mos*, custom, *mores*, manners. It comes from the Coptic and old Egyptian *Mes*, a child, to be born, to imagine (conceive?) *Mas*, to introduce, *Mer*, to rule over, superintend, bind.* That is to say, family order preceded the regulations of society at large, and consisted of 1. the authority of the parent over the child, and 2. the rights and duties of children in the family. When the family was enlarged to a nation, Morality became Common Law.

* *Ma* and *Mat*, truth; *Mak*, to think, consider, and regulate.

If, as it seems, the life of the whole race is destined to parallel the life of an individual man, then, the morality of its past childhood (the common law of its present adolescence) is destined to grow into the mature and more transcendental legislation of its future manhood, powerful, energetic, wise and good.

Law and *Legislation* are allied terms; but the distinction between them is notable. They are related as cause and effect, principle and practice. Legislation is the enactment of laws.

As *Law* is represented, on the one side, by *Usage*, which is common law based on equity,—and on the other side, by *Legal enactments*, which are special permissions, prohibitions, limitations and sanctions in the shape of punishment (never in the shape of reward)—so *Legislation* consists of both *Constitutional provisoes*, and *Parliamentary practice*.

The equation,—Common law : Legal enactments :: Constitutional provision : Parliamentary practice, is, however, analogical, not homological. For, enactments are attempts to specify and enforce customary justice; whereas the provisions of a constitutional convention are attempts to redress the licentious liberty of the legislature, by defining its functions, limiting its powers, and regulating its practice.*

Under Absolute monarchy, all the rights of legislation centre in the king. The parliament or legislature, if there be one, is merely his cabinet council.

Under Constitutional monarchy all the rights of legislation centre in some voting class, whose elected delegates control the king.

Under a Republic, based on universal suffrage, the whole nation (theoretically) convenes by *delegates* to arrange both the constitutional scope, and the legislative practice of human rights.

Delegation by election is therefore the radical principle of modern legislation.

How to perfect the modus operandi of popular elections,

* "Parliamentary practice" technically so called is merely a voluntary and convenient self-assumption of supplementary rules by the Legislature.

for selecting and empowering certain individuals, to legalize property and conduct, for multitudes, is the question of the future.

To suppose that this question in any country belongs to the past, is to ignore the progress of mankind in equity.

When kings have been obliged to grant the suffrage, they have racked their wits to make it as innocuous as possible to their prerogative.

In like manner, with every change of class or party domination, the suffrage shifts its garb. At the present moment *Scrutin de liste* and *Scrutin d'arrondissement* are watchwords of civil war in France. Much of the time of American politicians is spent in devising schemes for *apportioning* the suffrage to population (or population to suffrage) in view of coming elections. *Districting a State*, or "Gerrymandering" a district, has become a vile fine art in America. Human cupidity distorts the straight lines of Legislation, by first notching the edge of the ruler—Suffrage.

One fundamental maxim must come to be acknowledged: *No man has a right to express an opinion who does not know the subject.* And when the subject is the fitness of a candidate to act as legislator, expression of opinion means—a vote.

Consequently, no man has a right to vote for a representative of whose fitness for office he is ignorant.

But thousands vote for statesmen of whom they can know absolutely nothing. Millions vote, every four years, for the most powerful monarch on earth, the President of the United States, in complete ignorance of his character and abilities.

The radical cure for so radical an evil is to be found not in the *suppression* of popular suffrage; but in its *localization within the limits of personal acquaintance.*

This amounts to saying that the natural form of government is *Hierarchy.*

A republican hierarchy will perhaps be the government of the future. The old English system of "Hundreds" will be its basis. The elect of the Hundreds will be electors for Ward or Township officials; these in

turn will elect County officers; these, in their turn, State officers; these, Congress; and Congress the Executive of the nation. Personal acquaintance and personal responsibility will then react upon each other. Conventions on occasion will regulate and supplement the system.

It is not to be expected that people will yield readily or soon to such an innovation. It will be called reactionary, retrogressive. The Church of Rome and the Society of Jesus will be cited as warnings. But Nature cares nothing for warnings; neither does the true patriot, the true philosopher, nor a fully enlightened people. Fate is the embodiment of Patience. The Great Republic has only lived one century. Its constitution was constructed for five or six millions of people. In thirty years from now a hundred millions will find themselves irked by it. Children are already born who will not die before subscribing themselves citizens of a nation of two hundred millions of souls. By that time forty millions of male votes and forty millions of female votes will be cast together. The world has not yet imagined such a contingency; but the powers of destiny are preparing for it; and the American people are drilling at *Organization*, without knowing that when marching-orders arrive the field of action must be *Suffrage*.

The common man values more highly his worthless vote for Governor or President than his priceless vote for School Commissioner, Constable, or Butter inspector. When the woman comes to the poll, she will arrest this far-off gaze of the man, and turn it upon the really important interests surrounding the home, and the work-shop. Then, the *hierarchical* principle, which now works concealed in party politics to the mischief of society, will sit with dignity, and act beneficently, on the throne of constitutional prerogative.

The disturbing element of national politics is city life.

The time will come when the difference between *city* and *country* will be estimated and defined and taken into account in all legislation, both political and volun-

tary. Legislating experts will then be divided into two classes, differing from each other as completely as mechanical experts differ from chemical experts. No city lawyers will be permitted to have a voice in legislating for the country; no country lawyers for the city.

When each ward in a city shall be made so small that its affairs can be regulated by persons personally well known to and elected by all the residents in such ward;—when each small ward shall have its central edifice arranged conveniently and spaciouly for all the public uses or common purposes of a ward—with an exchange room for public conference and discussion—with a complete library free to all—with legislative rooms for committees of all kind—with judicial rooms for arbitration—with a hall arranged solely and specially for public festivals and music—with a theatre room for school exhibitions, concerts and dramas—with a ward museum of science, and an art gallery of statues and paintings—then, competition of a noble kind shall prevail between these ward edifices and the wards which own and use them; and the same social spiritual force which now sustains our imperfect church and sunday-school system, shall transfer its activity to, and find a more fruitful exercise for, its functions in this practical sphere of watching over and edifying, in all senses, every individual inhabitant of the ward, old and young, rich and poor, strong and feeble alike.

This is what the Future Destiny of Man in city life holds up to view. Something like this will be the ultimate outward shape taken by the genius of modern Socialism and Communism, flourishing on its only native soil—the city pavement.

In this regenerated body the vices of the old spirit will be ameliorated to genuine virtues.

Aristocracy will also more mightily prevail; inasmuch as, by restricting the locus and limit of the suffrage, the wisest, strongest and most useful people in each precinct will be known and recognized as the *best class*, and be honored and vested with power. This honor will be accepted as a sufficient reward, and the old vice of Aristocracy, the over-appropriation of special and personal privileges to itself, will be suppressed.

LECTURE XVI.

THE INTELLECTUAL AND MORAL DESTINY OF THE RACE.

Language is the real cement of a nation; and the chief barrier between nations. In the seclusion to which a nation is confined by a language peculiar to itself, its morality and religion, its tendencies in science and its criticism of art, become fixed national mannerisms; distinguishing its character—we may say, its personality—from that of every other nation speaking a different vernacular and publishing a different literature.

This happens not so much through the habitual use of a different vocabulary. It is rather in some peculiarity of verbal construction and of grammatical inflections; in the employment of favorite particles and untranslatable interjections; in a certain style of statement, direct or inverted, by short, sharp sentences or by sentences protracted, parenthetical, involved and introverted, that we must look for the influence of language upon national character. The rugged strength of the Roman as contrasted with the elegant Greek,—the brusque and honest directness of the Englishman as contrasted with the Parisian, is more than typified—is partly brought about—by the absence of the article, or the absence of case endings, from the vulgar tongue. The obscure prosiness of German literature, secured by the one rule of projecting the prepositional prefix of verbs to the end of the sentence, has had its effect upon the thinking of the whole nation. The parenthesis, enforced in the expression, has reacted on the logic of ideas. Opportunities for mystifying the reader, being multiplied by the

indefinitely extensible chain-work of a sentence, have ended by rendering the writer insensible to the risks of self-mystification.

The peculiarity of German metaphysics may be laid at the door of what is wrongly enough called the richness and flexibility of the German language; just as Locke's and Hume's severe thinking is greatly due to what is with equal injustice called the baldness and rigidity of English speech. When an unlimited liberty to compound long words is granted, the language of thinkers gets beyond the easy criticism of their readers; and so, unquestioned mental dictation becomes first irresponsible, then arrogant, and finally absurd. But when logical terms, postulates, and conclusions are compelled by the genius of a national language like the English to present themselves in single file, they are easily reviewed, and must keep their regimental uniform and equipments clean and efficient.

The effect upon the literature of the nation is cumulative. And the effect of its literature on the character of a nation is cumulative. In the lapse of ages, whole peoples become thus capable of constantly and on all the lines of life, misunderstanding each other. Granted the stirpal distinctiveness of Celt and Teuton, there is more in the guttural sound of the Swabian *ch* or the Prussian *k* to make them aliens in Paris than in all the history of the past; for it affects every individual Frenchman at every moment of intercourse. The one word *guess*, although brought from England to America in the "Mayflower," is a redder rag to inflame the national animosity of John Bull against the Yankee matadore, than the tariff act of 1844; because the one may become a forgotten wrong; the other continues to be an ever-fresh disgust.

Enough for illustration. Ancient history is full of such. The modern world is kept in chronic warfare by them. The spread of one language, then, at the expense of the rest, must tend to the future mutual good-understanding of mankind. If that language be a nervous, accurate, and copious method of expressing both facts and ideas, embodied in a literature of absolutely

all that is known, thought, conjectured and proposed, produced with lightning-like speed, in infinite abundance, — if, in a word, the English language and literature be evidently taking possession of the world, and will in another hundred years be spoken or understood by a fourth part of mankind,—then, the destiny of man for a more peaceful, useful, and noble existence obtains one more guarantee.

Inside of the regional limits of each language spoken on earth exist many provincial dialects of it, respecting which the considerations just stated hold good with moderated force. Consequently the spread of a language over the earth's surface does not involve the destruction of patois, or *dialects of speech*, but their multiplication. But the spread of one literature must extirpate other literatures, or *dialects of ideas*. Provincial expressions, like individual tones of voice, will continue to make the intercourse of mankind variously picturesque; and the birthplace of people will be recognizable by subtle indications. But a genuine community of ideas, and an honest co-operation for realizing them, will as plainly stamp future ages of man's history as the superstitious hatred of each other's languages has stamped the past history of nations.

In the beginnings of history Speech was recognized as the *expression* of character; and the most recent thinkers can advance not one step beyond this idea. The inner life of every animal makes itself outward (utters itself) by some appropriate vocal organ. By the sounds of their voices we know them, and by the words of their mouth the primal language-makers named them; as our children spontaneously do now. To hear the *Vox humana* stop play always excites the peculiar pleasure of astonishment, because it is known to belong elsewhere, and is a delightful intruder. We expect hoarse and coarse language from the carnivora, and from savages; fine modulated tones and various discourses from cultivated creatures. The mocking bird's repertoire depends upon the populousness of its native woods and fields. The parrot's tones may be organically croaking and screeching, but its high-pitched intellect

allows it to master many phrases if surrounded by numerous talkers.

Listen to the monotonous, invariable, space-penetrating bleat of sheep and low of kine, the horse's neigh, the crow's caw, the chirp of the katydid, the street cry of the milkman in the morning. Why so monotonous, so invariable, so far-reaching? Because it expresses only some one idea, under pressure of instant and pressing necessity. Because it expresses some one intellectual phenomenon, and leaves all the rest of the universe of thought to be elsewhere and otherwise expressed. Because the soul of the sheep, the horse, the crow, is an embryo soul, enclosed in a body perfect in babyhood, and never to advance beyond the narrowest limits during the few months of its earthly existence. What it is and what it wants it utters in its cry,—nothing more,—one cry suffices to express it all.

The monotonous wailing, and cooing of the human baby tells the same story of a limited but precise knowledge of vital necessities; a loud, insistent petition for help, food, comfort, love, from the Creator in surrounding Nature. When the child, after passing through years of experience, becomes a man, invested with dominion over Nature, and inspired with creative faculties of his own, his infantile monotones become modulated without limits, as the plaintive *schlag* of the nightingale passes into its brilliant and exhaustless carol.

The noisy monotonous chatter of vulgar or mal-educated people of both sexes is simply an imitation of the monotonous, uninflected, barren gabble of the lower creatures; while it is as perfect an expression of the inner life, as needful and satisfying an exercise of the half-developed brain, and as completely successful a process for establishing community of sentiment and action, on the whole, as if it were the table talk of Socrates and his disciples.

Educate these chatterers—discipline them by sorrow and by labor—cultivate them by study and by travel—fill their souls with holy emotions and their minds with varied knowledge—teach their hands the arts of life

and their taste the beauties of nature—and, gradually, the chatter dies away and language comes to take its place.

We predict then for mankind in the future,—when a more general and generous distribution of wealth and leisure shall produce its natural consequence, a greater variety of occupations, more movement among men and women,—that Human Language will become more copious and fluent accordingly.

The distinction between spoken language and literature must, however, be taken into strict account in all speculations about the future. This is taught by the well known history of the Latin language, which became the vehicle of communication between the many ill-coupled provinces of the Roman Empire, and afterwards between all the countries of Christendom, among a vast population speaking wholly different languages. It was the Latin literature that accomplished this result. The clergy translated their latin ideas into every vernacular, and in the end latinized the speech of the people. English words are thus becoming domiciled in all kinds of languages and will gradually expel their synonymes, and introduce grammatical forms adapted to themselves. The Mandarin literature, with its own proper dialect, is now—at the end of several centuries—comprehended and employed in all the provinces of the Chinese Empire, although each province speaks a language incomprehensible to the people of other provinces.

The more literature is multiplied the speedier comes the day when men will use a common speech. But the increase of French and German literature, by the side of English, will retard the adoption of English as a common human speech. What gives English the chances of the field is, 1. the English love of colonization as opposed to the French and Italian passion for home; and 2. the perfect willingness which the Germans and the Irish show to settle in English colonies and adopt the English language as their own.

The literature of Christendom has suffered two im-

portant physical changes: 1. the pamphlet of the politician has been absorbed into the newspaper; and 2. the folios of the learned have been replaced by octavos.

Belles-lettres uses now the monthly magazine as its chief vehicle, as the nobleman has learned to ride in the railway wagon and the fine lady in the street car alongside of common people. The sciences adopt a similar vehicle of publication, while learned societies are casting their memoirs more and more in the new mould of "Journals," or "Proceedings," so as to hasten and extend their issue, compelling their authors to adopt a more condensed mode of statement and a more matter-of-fact style. A species of newspaper for science has come into existence—like the London *Nature*—to announce at once whatever seems of interest or promises to be important.

Meantime, books never fail; books large and small; books that have cost a lifetime of hard work; books that are the ephemeral brood of empty brains; books on every conceivable and inconceivable subject of human meditation; books by the million for the million, and books never read but by recluses; books at once consigned to oblivion, still-born abortions of unhappy love; and books heralded by the renown of the author's genius, long waited for, at once enthroned among the glories of the age, and destined to enlighten, charm or sanctify successive generations. Judged by the test of these, the world is growing younger as it grows older, and like an incipient volcano, the internal heat of God's intelligence glows more and more toward its surface.

That some grand law of constant force operates in the production of literature, as in the harvests of the soil, in the balance of the animal creation, and even, as statistics prove, in the annual percentages and proportions of accidents, idiocy, insanity and crime, any modern list of books will show. One such has just been published by Heinrich, of Leipzig, in the *Zeitschrift* of the German Geological Society, No. 90, Vol. XV.

The bibliography of Germany for the years 1879 and 1880 is summed up thus:—

	1879	1880
German books of all kinds,*	14,179	14,941
School books and others for the young,	2,175	2,446
Law, politics, statistics, conveyancing,	1,683	1,557
Theology,	1,304	1,390
Belles-lettres,	1,170	1,209
Medicine,	732	790
Natural history, chemistry, pharmacy,	841	787
Historical works,	680	752
Popular works, almanacs,	642	657
Fine arts, stenography, archæology, mythology,	481	533
Modern languages, old German literature,	485	506
Agriculture,	421	433
Miscellaneous writings,	378	423
Architecture, railways, engineering, mines, navigation,	384	403
Bibliography, encyclopædias,	278	377
Geography, travels,	306	356
War,	337	353
Maps,	300	301
Mathematics, astronomy,	158	201
Philosophy,	139	125
Forests and game,	103	112
Freemasonry,	21	20

And such must be the supply of intellectual food furnished to every future generation, improving in quality as the world grows wiser and better, and in quantity with the demand for it.

But it is asked: Will not the practical supplant the imaginative? Shall not speculation cease with the perfection of science? and poetry with the dissipation of error and superstition? and the drama be degraded to the level of the text-book? and all fiction become the mere story-telling of traveller's adventures, or a realistic portraiture of society? Shall the world ever know another Homer, Milton, Shakespeare, Kant, or Thomas à Kempis?—As well ask if the genius of creation is exhausted. As well ask if the heart of the world is destined to chronic ossification, or fatty degeneration. As

* The author is not responsible for this total. The table is given as a quotation.

well ask if in future ages babes are to issue from their mothers' wombs monsters of maturity or senility. For so long as infancy shall crow on every mother's lap, and marriage follow true love of boys and girls, so long will rhymes be sung and music lead the dance; so long will the theatre and opera house be crowded, and new Mozarts and Shakespeares will supply what shall make the bosom of the world heave with passion and its eyes stream with tears. And so long as the mist of parting spirits shall rise as a thick and constant cloud from the planet smoking with the incessant life of death, shall holier men fill all lands with tender words of comfort for the bereaved, and Imitations of Christ be repeated by writers who live nearer, and ever nearer, my God, to Thee.

The reputation of every great poet, composer, historian, philosopher and man of science, or religion, has been in part factitious; due partly to his genius, and partly to opportunities of its display. The delight of mankind in the surprising advent of the divine blessing has impressed it more deeply on the world's memory. Great comets have often lit up the sky; but those which have come in ways and at seasons favorable for human observation have claimed precedency of the rest. Many have been the conjunctions of the planets Jupiter and Saturn; but only the one that happened to coincide with the birth of Christ was named the Star of Bethlehem, and will live in story.

Transcendent genius is not a rare production of any age; but the occasion and the genius must fall properly together to excite the hero-worshipping spirit. The founder of a dynasty is always accounted god-like. The great teacher of a new science is greater than his greater followers. The world is easily *blasé*; a charge of imitation is the death of reputation; no matter if the imitator be a nonpareil. He who suggests an explanation claims mastership over those who furnish it. Such are the frailties of fame. We need not fear that when great occasions arise souls are not already born for them. Troy is buried and there will be no second Homer. Manners are so changed that were Shakespeare one of

us we should not recognize him by the dramas he would now be writing. Hegel and Schopenhauer have made another Kant impossible and undesirable. Von Baer has supplanted Oken, and Agassiz, Von Baer. But as these arose at the call of human destiny, a thousand more shall sleep for ages until the trumpet of their generation sounds; and so the literature of the world flows on, and must ever flow, like the Mississippi or the Danube, while rain falls, and grass grows, and the soul of God finds utterance through the hearts and minds of men.

And the same question is asked respecting the Fine Arts; and shall be answered in like manner. In waves like the commotions of the atmosphere, the creative faculty in art sweeps across the ages. Renaissance succeeds renaissance. We live just now under a high barometer of art. The form of Paris, the color of Antwerp, never was excelled and seldom equalled in the palmiest days of Italy and Greece. The hell scene of Polygnotus at Delphi, unconsciously imitated by the unknown master-painter of Pisa, and again by Buonarrotti in the chapel of the Vatican, is surpassed even as a *tour de force*, to say nothing of technique, by the great canvases of David and Kaulbach.

The influence of the physical sciences upon the Fine Arts is most curious and instructive.

In the earliest historical age, the art of sculpture was perfected by a close observation of objects under the inspiration of family pride and personal affection. This produced the wonderful statues of the monarchs and officials of the Fourth and Fifth dynasties of Egypt, found in the tombs of Memphis, dating from at least 3,000 years before the Christian era. The rude sketches of wild animals made on fragments of tusk and bone by palæolithic men were inspired by personal adventures.

The most ancient scribes of Egypt improved on these, when they adopted the forms of birds, beasts, fish and human implements as syllables and letters of the alphabet. No longer solitary woodsmen, but associated denizens of palaces and temples in the midst of a crowded and wealthy population, the native spirit of the artists

awoke to the delights of praise, and strove for perfection of detail. A pre-Raphaelistic fineness of touch characterizes the carvings and the frescoes of the tombs. But a plethora of work induced conventionalism in delineation; and the imitation of nature fell into disuse for recording the exaggerations of a monarch's successes, and for representing the growing absurdities of a complicated Pantheon. Still further degraded by the hideous chimera worship of Phœnician commerce, fused with the symbolism of Mesopotamia and Thrace, the art of sculpture sank to its lowest degradation. In India and China the same effects produced like causes without a revival. But Greece, which could evolve the lovely and exalted Pythian Apollo from the hideous Tyrian Melcarth, and breed a Solon, Lycurgus, Pericles and Alcibiades, an Aspasia and a Sappho, a Socrates and a Plato, a Democritus and an Anaximander, could also create a Phidias, a Praxiteles and a Polygnotus. Once more the imitation of nature became the canon of art; and Nature was so beautiful in Greece that Art could achieve its masterpieces. But to the Greek, Nature meant Man; and the Florentine boar remains a curious anomaly of Greek artistic caprice.

Painting therefore in our sense of it could not flourish; and *landscape painting*, to a race of sailors on the most picturesque of seas, and landsmen who sat on the stone benches of a theatre in the open air surrounded by all the glories of land and water to listen to the dramas of Æschylus and the comedies of Aristophanes, was a discarded superfluity. The garden frescoes of Pompeii probably represent all there was of ancient landscape art.

When classic art perished at the fall of Rome, and the rude Christian symbolism of half-heathen Europe was realized in stone and on plaster by mechanics in the disguise or in the pay of monks, form and color were mere suggestions of spiritual yearnings, and had no value of themselves. When the Moslem came, and then the Turk, and the learning that lingered in the East was exiled to Italy, the love of the beautiful awoke once more, but still with but half-dissipated dreams of the night; and its morning was spent in the endeavor to

realize in marble the fleeting visions it had got of God and the prophets, of Christ and his apostles, of Mary and the martyred saints. The doors of the Baptisteries were cast in historic panels of the acts of Jesus; the walls of churches became a mosaic of Bible history; or were frescoed with the sufferings and triumphs of the Church's witnesses. Nature was still the creation, not of the divine father, but of the Demiurge. The invisible alone deserved to be rendered visible.

But when this sacred task had been well performed the artists were set free, and Leonardo and Raphael and Murillo began to spiritualize the material and teach once more the beautiful in flesh and blood. In the North, shut up in commodious homes, the Dutch painters began to paint flowers and fruits; and their domestic easel pictures reacted on the classic sentiment of the South. And so—and so—and so—we see what we now see.

But a great revolution has been in progress. The development of criticism in history has made men impatient of those legends which constituted the staple of both sculpture and painting. No second Rubens is now possible. Allegory has become contemptible. Protestantism protests against all representations of the great Unknown, the mystical and the sentimentally ascetical. But Science makes a still more imperative and coercive protest against all representations of the unnatural and impossible. Never again will be executed a great painting of the Adam and the beasts, the Noah and his deluge, the Moses descending from Mt. Sinai, Elijah rapt into the sky in a chariot of fire, Jesus walking on the water, or Saint Theresa floating in the air. Science permits the beautiful, the grand, even the cataclysmic, in pictorial art; for these reside and occur in Nature. But the modern world, charged as it is already with the sentiment of *fact*, and the future informed as it will be of every possibility of *fact*, will have nothing more to do with winged horses and dragon-slayers, cherubim and seraphim; nor endure the least departure from just form and color, even for the sake of the holiest sentiment.

Although the great schools of Munich and Düsseldorf

were never more flourishing, nor so many artists were ever painting in the galleries of Dresden, Berlin, Florence, Madrid and London, Paris is now the acknowledged Capital of Art.* Here an intense realism prevails. Paint what you please, but let it be exactly like what it is meant to represent; whether a peasant girl returning from the sea flats with a basket of shrimps, or LePage's peasant Joan d'Arc, under the apple-tree before her cottage, seeing the King and the Madonna in her half-entrancement; whether it be a scene in a ball-room or the horrors of a massacre, let every detail of the truth be visible. Modern science has made the modern Parisian atelier, and explains its dogmas in the lecture-rooms of the Ecole Nationale et Spéciale des Beaux Arts of the Rue Bonaparte. But all its explanations sum up in one word, *Nature*. Its only sentiment is that belief in the essential rightness of things as they are, considered *a priori*, which inspires every branch of modern science, and all the applications of science to all the arts of life, useful and beautiful alike. The tendency shown by science to ignore the idea of sin as sin is therefore frightfully parodied by French art, and a scientific fanaticism in behalf of the reality and truth of the accidents betrays and deplorably degrades the true faith in the reality of lawful phenomena.

It is this feature of modern art which may — or may not — in its turn disappear. Surely the Destiny of Mankind shall provide for its disappearance. Surely, as virtue increases in the land, pictures of vice will cease to be desired, and so cease to be painted. Modern Art, drunk with youthful life, is sowing its wild oats.

The number of pictures is now immense. Six thousand French paintings executed during the preceding twelvemonth were exhibited at the French Salon of 1880. To distribute these throughout Europe and America, to adorn the walls of private dwellings, is the work of a few short years. The demand for statuary and painting in the United States increases every year;

* The reader will get an excellent idea of the facilities it affords, from Miss Phœbe Natt's short sketch of them in *Lippincott's Magazine* for March, 1881.

and it will not be long before the supply will be afforded by the Art Schools of Philadelphia, New York, Cincinnati, Chicago, and St. Louis, with little aid from Europe.

Already landscape pictures by American artists take rank with the best of the age; and the equestrian statues of Henry K. Brown and the frescoes of William Hunt are worthy of a place in any gallery.

It would be a mere act of philistinism to multiply the number of works of art annually executed, by the number of years in the coming centuries, to make an estimate of the boundless treasures of coming generations. But it gratifies the heart to predict so much pleasure for babes unborn, and to finish our sketch of the physical destiny of man by crowning it with these garlands of roses.

But when we reflect that the Fine Arts are no longer the exclusive property of the Church and the Aristocracy, whether of title or of wealth, but have been enlisted into the ordinary occupations of trade and manufactures; and are made especially to subserve the purposes of Natural History as a branch of Education; a new career is seen to open before them far more extensive and more important than they have run. Exquisitely beautiful colored delineations of animals and plants are now published by academies and societies of science. Photographs of mountain scenery illustrate government surveys and geological reports. Photographs and colored plates of discovered objects are considered indispensable to good archæological memoirs. Books of travel are now made salable by means of admirably artistic landscape and *genre* paintings. Even Encyclopædias are now illuminated like old Missals. The influence of the sciences is everywhere apparent in the transference of the work of the artist from the capricious service of the *powerful and wealthy few* to the constant and reliable service of the *millions*; not so much with a view to their amusement, as under stress of educational needs. Primary education bids fair to become in great measure pictorial, and the stimulation of the young mind is intrusted to those who can make the world it enters as picturesque as possible.

The *Architecture* of the Future will not be confined to gorgeous edifices, but will more than rival the greatest works of the most practical races of ancient and modern days. Every city will be flooded with water like Imperial Rome; and every river will be spanned by as many bridges as the Seine in Paris.

Accumulation is the work, the test, the legacy, the glory of Time.

Time buries all the labor of man, sings the poet. Nay,—that is not Time's doing. Time is innocent. War, man's true fiend, throws down his edifices and heaps one ruined city on another. So, when wars shall cease, ruins will be replaced by new monuments, more and more substantial and grandiose; and the spread of the old schools and the rise of new ones, shall prevent the traditionally beautiful from being forgotten; the lovely shapes of past ages shall be abundantly imitated; and a thousand new combinations and fresh lines be introduced. As Peace and Plenty have restored all the cathedrals and some of the great castles of France, and protected those of England from decay; as the Dom at Cologne after waiting for centuries has been just completed out of the contributions of all Germany; and Sanctus Paulus extra Muros rebuilt with unrivalled splendor by a living Pope; and St. Patrick's cathedral rises in New York in the very form which it is the fashion to consider extinct; so, as peace and plenty spread to Greece and Syria and Egypt,—to Bagdad and Candahar and the sites of ancient Bactrian splendor,—the styles of all ages will revive from their graves. Ruined monuments which are now but the study of the antiquary, will inspire a host of native architects in every land with patriotic zeal. The past will live again in its very dress. The quarries of Syene and Baalbec will be reopened. The obelisks will be replaced, the Column of the Sun re-erected and the tower of Babel rebuilt. But near them will also rise Oriental railroad stations and houses of parliament, grand opera houses, museums, and Walhallas, of styles produced by the intermarriage of the genii of the East and West.

How large a rôle religion will play in the Architecture

of the future may be guessed from the knowledge we have of the intimacy existing between the sensuous imagination and the sentiment of providence. Every kind of religious worship has cultivated a grandiose architecture of its own. If men must always be religious and affect associated worship, directed by a priestly class, then, the larger the Ecclesia, the larger the House of God; the more devout the worshippers, the more magnificent the ritual; the greater the accumulations of wealth, the more lavish the expenditure; but the style will vary with race and climate as before.

The possible *Education* of the whole human race is evidently not a question of kind but of degree. The widening of favorable circumstances ought always to multiply the number of the instructed, whether the greater multitude pursue a higher curriculum or not. It is easy enough to prove that a very small percentage of any nation or race can ever become exceptionally learned; and that the millions will in all future ages be too busy and too poor to gain more than a primary education. If the race of man be left to inhabit the earth tens of thousands of years, as is most likely, a university course must always be a privilege, a prize, a good fortune, and a special blessing. This will even become more and not less the case through an increase of general peace, plenty and prosperity; for with these go hand in hand ease of marriage and a swelling tide of births; consequently a denser population; consequently a severer struggle for life, a more imperative confinement to place and occupation, lower wages, an increase in the number of hours of work, and the shortening of the term of years of schooling for children. The dense ignorance of the English population has been produced in this way by the exceptional enhancement of employment for men, women and children alike; while the extraordinary general intelligence of the people of the United States tells the same tale. For, land being unbounded, and food superfluously abundant, no crowding has yet taken place; life is easy; women are left to breed and nurse children; and children are not called upon to

help support the family until they have nearly or quite reached their majority. Two hundred years hence the great multitude of Americans will be no better educated than the multitudes of Germans in Germany are to-day.

And this must needs happen in spite of the advance of science, in spite of the pulpit and the press, in spite of Educational Bureaus, Boards and Societies, and quite apart from the also inevitable *pro rata* increment of private and common schools, normal schools, colleges and universities.

The signs of the working of Nature's law to this effect are already patent, in a reaction against the forcing process to which American youth of both sexes are now subjected; and in the healthier tone of public sentiment respecting the disastrous consequences of over-educating the children of hard-working parents, who must be hard workers themselves, or become burdensome to the Commonwealth. Already "a higher education" is becoming a privilege and prize out of the reach of the majority of honest people.

Is this pessimist doctrine? By no means. It simply teaches that the bulk of the human race must work all their lives; and consequently cannot learn in childhood anything more than to read, write and cipher; nor in adult life things unconnected with their daily employments. This is the general destiny of mankind wherever it increases and multiplies on the face of the earth. And when the whole surface of the globe is filled with a laborious, honest, peace-loving, orderly, moral and religious multitude this destiny will find its grandest exhibition.

In nothing so well as in education does human destiny proclaim its mission of *sufficient good for all, and no more*. In nothing is "the Possible" so evidently limited for each as to quality, and so evidently unlimited for all as to quantity. No human being will ever succeed in becoming more learned or wiser than certain men and women have already been, or than not a few individuals now living are. And the same is true of goodness; of genius; of force of character. The acme of *quality* was long ago reached in the destiny of indi-

viduals, and will be reached in many more in all coming ages.

But the bright destiny of the race is this: — the number of the *sufficiently* good, wise, learned, skilful, energetic, honest, thrifty, temperate and chaste will increase — ever increase — perhaps at times more rapidly increase, under the influence of proper instruction bestowed on all at an early age; until the last traces of the brutish populations which still infest — rather than inhabit — all countries under the sun shall have disappeared; until by successive generations of *sufficiently* taught children a disposition for useful knowledge shall become generally hereditary and unbiassed traditions of the true and beautiful shall direct the conduct of every family and every state.

The *quantity* of virtue and the quantity of intelligence will then be infinitely great; while the *quality* of neither mercy, justice nor truth, in any individual, will be any more illustrious than it is now.

To bring this about we recognize three necessities: — 1. The compulsory education of all children without exception; 2. The education of woman on a full equality with man; and 3. The co-education of the sexes.

The compulsory education of all children is now so soundly accepted as to be enacted by the most enlightened governments. The only objections to it which deserve a patient hearing are drawn: — 1. From its supposed interference with the right of parents to decide the fate of their offspring; 2. From its supposed exasperating effect upon the lowest classes of society; and 3. From its dreaded invasion of the domain of this or that established church or religious sect.

The first objection represents a sentiment proper to past ages, when the woman was accounted property, as well as her children, by the husband and father.

The second objection is urged against *compulsion* as less effectual than *persuasion*, and bearing sour fruit. But it must be acknowledged by all who study the lower forms of social life, that, as justice must be mixed with mercy and sternness with sympathy, so the worst evils can only be rooted out *vi et armis*, and children who are *compelled*

by vicious parents to learn how to ruin themselves and infect society should be *compelled* by society to reform themselves and learn wisdom in spite of their dreadful surroundings. Compulsory Education is compulsion, not for the helpless child, but for the criminal parent. Society knows that it can reclaim and save the child by a strong hand and an outstretched arm even when the parent of the child is unreclaimable and destined to destruction.

The third objection is a despairing cry from Superstition, seeing in the rising sun only a warning to depart back to the hell it came from.

All living things have been endowed with instincts how to live.

Human society has a divine inspiration how to live in every age and stage of its existence. The polity of a savage tribe is as perfectly well ordered *for its circumstances* as that of the most enlightened civilized government *for its circumstances*. It is idle to object to the compulsory instruction of the children of a compact community in that kind of knowledge which the majority of its healthy members feel to be most needful for the common weal. The brain demands food for itself, for the heart, the lungs, the liver, the kidneys, the spleen, the muscles and the nerves, even where the stomach rebels. Priests who fight against a common school system are precisely the diseased entrails of the body politic.

The education of the female sex to an equal degree with that of the male sex is distinctly predicted by the current history of the United States and England. In other countries woman is still regarded as a breeder, cook and nurse, for man's benefit. The birth of girls is a necessity for securing the continuance of the male population of the world. The education of woman is discouraged in view of her probable interference with the political monopoly enjoyed by man, and of her certain competition with man in the crafts and trades. The more skilful the art, the more jealous the artisan and artist. Physicians abhor female medical students. Painters exclude women from their studios. Preachers

announce the word of the Lord that women must be silent in the churches. Critics scoff at the ability of woman to write an epic or compose an opera. Men of science patronize female observers, but expect from them no discoveries of natural law. Politicians bar against the sex of the house every exit to the street and every entrance to the forum, on the pretence that the street and the forum will convert them into men; but in reality for the purpose of keeping the sex of the street independent of the only influence which can cleanse the street and ennoble the forum.

As all laws are made by men alone, without consultation with women; as all lawmakers are elected by men alone, women being excluded from the polls; as all judges, barristers, jurymen, sheriffs, policemen, jailers, all boards of control, all school directors, in a word all parts of the machinery of the government of male and female society are composed of men alone—the female element being wholly and absolutely excluded—liberty, independence, self-government, democracy, civilization, are terms which have only an accidental meaning for one-half the human race, and mark the progress of only that half in the destiny of the race. The Destiny of Man can fully work itself out only after the abolition of the factitious political distinction which is now everywhere made between the two sexes; when women shall govern men as thoroughly and regularly as men now govern women; when the male and female mind and conscience combined shall regulate male and female society regarded as a unit.

This is the newest sentiment of our day, and will become the dominant sentiment of future ages.

This sentiment is born of the education of woman, and will prevail in proportion as the sex is educated. The intellectual genius of woman, aborted by the skilful management of the male sex hitherto, asserts its rights, and recuperates its power, by tearing the mask from the face of injustice, and by disrobing society so as to reveal its hideous sores; claiming that woman alone can heal these sores; and in order to do this must be granted her just share of public power.

The battle which women are winning is the first of a fine campaign; the first, against their fathers, husbands, brothers, and sons; the rest, against adulterers and seducers, dishonest guardians and trustees, pilfering office-holders, slanderous newspaper editors and obscene book writers, lazy officials, brutal jailers and madhouse keepers, uneducated nurses, drunken, stupid school directors, licentious theatres, the gambling hells, and that crowning woe of the city world, innumerable rows of grog-shops, sucking in by day and night the precious heritage of women, spoiling all that would be lovely in life, and breeding all that is deadly for future generations.

All these evils are represented by the male sex — by individual men, in close consultation among themselves, relieved of the restraints of the presence of good women, unchecked by their remonstrances, unenlightened by their information. The legal concurrence of one well-educated, right-minded woman would in most instances suffice to reorganize on a noble basis the ignoble conduct of legislature, court, and council chamber. How perfect would be the reform were an equal number of men and women to sit at every public board of management and control!

But the women selected for this task must be *well* educated; and to educate such individual women, the whole female sex must be well educated. But a good system of female education will inevitably react to improve the education of the male sex. And to perfect the operation the two sexes must be educated together. To do this rightly boards of school directors must be composed of both sexes. Are not mothers as much the owners of children as fathers are? And what do men know of the proper mode, means and degree of the education of girls? Yet all school directors are males.

The induction of women into the rights and powers of school direction is the hinge on which turns the opening door of the coming civilization of the human race. This is all that is needed to secure the selection of fit teachers for children. From these will come the advanced teachers of the future. The general improve-

ment of primary education will result in an increased number of women capable of higher instruction. Already the whole field of human learning is open to cultivation of woman at Oberlin (women have been admitted at Oberlin since its founding in 1835), Ann Arbor, at Cornell, at Swarthmore, at Northampton, at Poughkeepsie. Even the venerable seats of learning at Boston and Philadelphia have been compelled to grant *quasi* university courses to female students. And Cambridge, old Cambridge in England, grants diplomas on the sly to those of the disfranchised sex who demand them vigorously. In time the superb creatures who taught science in the still older universities of Italy will have a host of equal successors lecturing and demonstrating from the professors' chairs of the future. Even now female doctors of medicine, philosophy, chemistry, letters and arts are founding schools of their own and laying the basis for a general education of their own sex equal in all respects to the general education of the other sex, hitherto its master, henceforth only its rival.*

Slow and sure is the word of the Lord. Step by step the destiny advances. By insensible gradations the dawn melts into daylight. Line upon line and precept upon precept, here a little and there a little, the race of mankind becomes aware of its fate. One nation after another opens its sleepy eyes and slowly gets upon its feet and goes to work. Minister of Public Instruction, Mr. Ferry, has just issued orders to the school-masters of 40,000 parishes in France to meet in their 2,000

* See six reasons why the English University of Cambridge "should be one of the leading centres of female education," in a paper issued from Cambridge in view of the discussion Feb. 24, 1881,—in *Nature* of that date, page 394. Oxford, too, is going in the same direction as Cambridge, very fast. The first woman student has been admitted to the Sorbonne at Paris, and to the University of Berlin: and there are a great number of women students at a university in St. Petersburg. The first woman has just been graduated as *Dottressa* in the Papal College at Rome. In the United States all the new State Universities, founded on the great Government land grant, admit women, I think: and in Wisconsin, Minnesota, Kansas, Iowa, Indiana, California, etc., are rapidly becoming great centres of learning. Indeed it would be hardly possible now to establish *de novo* a great university for the education of men alone.

district towns and send up delegates to a School Convention at Paris. Two thousand select school-masters of the Republic will there discuss the best measures for perfecting the general education of the nation. Switzerland is converting itself into a Central University for Europe. Germany has carried the primary education of boys and girls to the highest pitch, but still hesitates to permit girls to advance beyond the rudiments. In the course of another century or two the popular learning of the West will invade the Orient; and the already long since well established school system of China will be applied to the rapid spread of right knowledge throughout the most populous region of the globe.

As the result is already predetermined and inevitable, there is no need of passion in advocating the means for producing it. Fanaticism is out of place. The women of America are not called upon to abuse the men for doing only half the work. Their own duty lies before them,—to do the other half.

The Co-education of the sexes is the third aspect of the subject. It needs no argument. It is certain to prevail. It has been tried and been successful. The hostility of the male sex to it arises from either an impure and an ignoble timidity; from a superficial knowledge of natural laws; from deep-rooted prejudices inherited from unenlightened ancestors fostered by the half-enlightened conversation of society; or, from lack of faith in the native worth of woman's practical character; and at the same time from an obscure instinctive premonition which inconsistently enough affirms to them that the female sex, superior to the male in everything but physical strength and mental energy, is destined to resume its prehistoric rôle of government, and to perform most of the *legislative* functions of society, leaving the *executive* in the stronger hands of men.

Safely leaving the common-sense of whole populations to take care of popular education on the plain, and turning to contemplate the peaks of human learning climbed by the few, an inspiring spectacle awaits us. Thousands and ten thousands of investigators occupy the scene. Although a minute proportion of the myriads

that populate the earth, this scattered multitude — scattered, but in complete communication with each other — fulfil all the laws of discovery and distribute the precious fruits of research to feed the hunger of the universal mind. No more pedantry — no more scholasticism — no more crude conjectures — no more superstitions. All, knowledge; won by investigation, and tested by experiment. Men of science, the future order of nobility; teachers of facts and laws and uses and methods, the acknowledged leaders and rulers of society; incipient intellect, the object of the most sedulous fostering care; charlatans, drowned in the sea of real learning on which they spread their sails; cant, replaced by simple lucid demonstration; truths, painted in the perspective of great and small, important and unimportant, each subordinate to the natural hierarchy of phenomena, and the good and beautiful made always and in all cases to rank the commonplace; schools, colleges, universities, purged of all obstructive or repressive routine; the graduation of capacities, strict yet generous; the forward advancement of the best endowed, no longer hindered by an inert mass of stupidity favored by fortune; endowments, plentiful and adequate and wisely administered, not by the rules of trade, nor for privileged classes, but by men expert in education, and for those whose natural abilities it will pay the world best to favor.

Dead men's legacies have crushed the Universities. A city should *own* its University, not merely *have* it; as a curiosity for visitors to look at; or a convenient wall to which a private citizen may now and then affix his cenotaph. The day comes when the city will no more leave the maintenance of its University to private chance or caprice, or to the accidents of trade, than its mayor's office, its council chamber, its court house, its almshouse, its hospital, or its prison. To drain the city of ignorance is as obligatory a duty upon all as to drain it of filth. To furnish the city with an abundance of the best science is as imperative a part of good government as to provide a plenty of pure water, or gas-light. The common and high schools are supported by general tax-

ation; the University, the culmination of the educational system is still left to chance.

In England the perversion of ancient wealth at Oxford and Cambridge to the delectation of aristocratic pride and indolence has become a scandal and a nuisance. What those celebrated beds of roses could be made to produce — and will surely soon be made to produce — is thus stated by Max Müller in his recent address in the University College, London: —

To compare the work that Oxford or Cambridge could do and ought to do, with that of any other university, whether British or Continental, is simply absurd. Oxford, with its excellent material, the well-fed and well-bred youth of these islands; Oxford with its many students who have not to work for their bread; Oxford, with its rich colleges and libraries and fellowships, can do for the advancement of learning fifty times over what Giessen or even Leipsic can do. Oxford and Cambridge could beggar the whole world and make the old universities the home of all English genius, all English learning, all English art, all English virtue.

The plan he proposes is a simple one. Prize fellowships are in future to be tenable for five or seven years only. He proposes that, if a Fellow has then developed a taste for scientific work and wishes to continue it, he shall have a second fellowship with duties attached, like those of the Extraordinary Professors in Germany. Let the few who hold out another five years receive a third fellowship and become Ordinary Professors for life, with an income from the three fellowships of £1,000 per annum.

But if the ancient endowments of the two English universities are to be thus utilized for future work, the same improved public sentiment which works the change in them will gradually effect a more radical enhancement of the University system, in other countries, so soon as a few democratic revolutions shall have overthrown the existent governments fortified by standing armies, and the millions now taxed for war shall be competent to tax themselves for knowledge. The destiny of nations is not merely to beat swords and spears into ploughs and pruning-hooks, but to eject the soldiery from forts and fill their places with astronomers and meteorolo-

gists; to convert barracks into universities; and to supply men of science with an artillery of research as efficient and not half so costly as the equipment lavished upon troops.

The Philanthropy of the future: what may we expect it to be? The same in kind, degree and method as it has been in the past? Or, something nobler, greater, wiser?

Surely the growth of general intelligence must affect philanthropic conduct. The better knowledge of human distress will widen and deepen the sentiment of pity; and the acuter and more thorough investigation of its causes will modify the practise of its cure.

The first need of civilized man is a good home.

Tenement houses for the poor represent the two opposite poles — of squalid misery and of cheap comfort.

Left to the selfishness of impious wealth the arrangements of life for the outcast classes are the last desperate lairs of wild beasts in districts from which the pressure of surrounding superior species threatens extermination. Committed to the wise benevolence of pious wealth the arrangements of life for the classes which are always on the verge of becoming outcast are sweet, wholesome, hopeful and thrift-inspiring.

Where, as in Philadelphia, a whole population can by a little foresight and self-government easily save and build their own dwellings, at an average cost of from \$1,000 to \$1,500, over a wide space, all goes well. Where, as in London, millions are cramped and crushed into a sweltering mass, a divine philanthropy is called for, and becomes illustrious through such success as that which has followed the application of George Peabody's bequest of \$2,500,000. In 17 years eleven blocks of houses for the poor have been erected in various quarters of the great metropolis, at a cost of \$2,750,000; constituting 2,355 separate dwellings, with 5,170 living rooms (besides bath-rooms, laundries and wash-houses free in common), inhabited by 9,899 persons, on an average rent of \$1.00 per week per dwelling, and \$0.50 per week per room, with a death rate of 19.71 per 1,000

(2.49 less than the death rate of the city as a whole). In 1881 other blocks will be built adding to this saved population 3,500 persons more.

The tendency of a part of mankind to crowd into cities is as natural as the occlusion of hydrogen in the pores of a mass of iron. But it is a mistake to suppose that cities grow by this process; their growth is organic like that of a peat bog. At first they are planted from without; but once established, they enlarge themselves from their own seed-vessels. This is proven by the history of a normal city like Philadelphia, in which every married couple strives to live in a separate house. By comparing the annual number of native-born youth of both sexes who come of age, and may be supposed to marry,—and the annual number of houses built,—the two numbers will be seen to agree. It follows, then, that the number of new comers to settle in the city is about balanced by the number of native-born citizens who migrate from it.

Every great manufacturing city obeys this law of normal organic growth, and may be safely left to its normal arrangements for cleansing itself of its own offal. But great commercial ports like New York, Liverpool, London, Marseilles, Alexandria, Calcutta, Canton, have a double growth. Besides the native growth, there is an afflux. And besides the immigration, which is mostly not harmful but useful, there is a floating population of sailors and traders and criminals. These have to be regulated specifically.

Tramps and professional beggars and criminals are the outgrowth of times of special social disturbance, like the American civil war of 1861 or the Bulgarian revolution; or, to cite the most notable of all examples, like the Tai-ping rebellion in the Chinese Empire, which lasted 20 years, and in its sixteenth year destroyed 10,000,000 lives in one province alone. But they are chronically produced by any standing maladjustment of the apparatus of social life; such as a long continued disproportion between supply and demand; or a succession of bad crops; or the development of gold, diamond and oil regions; or a permanent occupa-

tion of an empire by incompetent foreign rulers, like the Turks.

The hope of the future is, that such disturbances, whether sporadic, or continuous, will become rarer, and through the spread of intelligence and the enforcement of just laws by all and for all, cease to afflict humanity. When the Turk, the fanatic and the usurer fail, mankind will find no excuse for rebellion, civil war and theft. But a shrewd and active philanthropy must substitute itself for the mischief-breeding domination of the honest many by the dishonest few.

Philanthropy should be the science of Hygiene respecting Roguery in society. Hitherto it has neither been a science, nor has it had roguery in view. On the contrary, it has been a mere sentiment of fanaticism, selfish in its own nature, and wholly unaware of what its own name meant. One of the worst misinterpretations of Christianity has been the popular clerical doctrine of the virtue of almsgiving *per se*, and of its heavenly reward *as such*. Men will learn in course of time that Benevolence becomes Malevolence through unenquiring almsgiving; and if God in assigning his rewards regards the consequences of conduct, the paying teller's desk at which such Benevolence must present its warrants is certainly not in Heaven.

The cure for beggary is not compulsory labor; but a humane and sympathetic instruction and assistance; having for its object, first, a revival of the beggar's self-respect, and secondly, a stimulation of his pride in self-support. The beggar must have a new set of ideas and feelings forced into him; and then, a chance given him to realize the ideas, and gratify the feelings. Almsgiving is as bad a medicine for unthrift, as is whiskey for low spirits; and works woe in the same fashion.

The old time recipe to cure a cat is to make disgust rectify its intellect. So the only effectual cure for sordid unthrift and that *pretended* starvation which appeals for eleemosynary relief, is the application of doses of real and *actual* starvation; administered not at all as a punishment; nor, in the spirit of a family physician dealing with a case of gout or gluttony; but, on

the principle of the Socratic method of reasoning with a sluggish mind or indifferent scholar. When beggars *really* come to starve, which, unfortunately, so-called Christian Benevolence takes good care to prevent, they not only begin to listen to certain questions which Nature has been asking them in vain, but they begin also to feel the force and bearing of said questions; and then—and not till then—they cast about to find the answers.

It is the business of Philanthropy to be on hand to help them comprehend the questions and suggest the answers.

Organized Charity—this is the discovery of our age; this is the last analysis of the teachings of Jesus; this is the arena in which future saints and sages may compete together until the saints become sages and the sages saints; this is the apparatus by which alone Human Society can relieve itself of the miseries of poverty. “The poor ye shall always have with you.” Certainly. But not necessarily stupid poor, lazy poor, sordid poor, dishonest poor, licentious poor, mischievous poor, disgusting, degraded, drunken, haggard, howling, evil-eyed and foul-mouthed poor, whining in the streets for a sixpence, exchanging it for a glass of whiskey, and holding out the hand for another “for the love of God.” Yet this is precisely the species of poor which the popular doctrine of Christian Charity breeds.

Jesus fed the multitude which followed him into the desert; but he gave no sixpences “for the love of God.”

It is reported that *once*, to *one* person, he said, “Sell all that thou hast and give to the poor.” But it is not reported that he ever gave money to the poor. Only once does he seem to have given bread; and then the occasion was desperate; the hungry were in a desert, where they could neither make food nor earn wages.

Responsibility is the touchstone of that Penury which it is lawful to relieve. The first duty of every creature is to provide for itself. The creature that responds not to this law of the Creator perishes—sooner or later. To save it for the moment from the effects of its own *Irresponsibility* is merely to protract its living death.

Whatever saps the sentiment of its personal Responsibility poisons the fountains of its existence; and "christian charity" has been practising this poisoning trade for many centuries.

The wealthy classes, and the clergy holding their purse-strings, try to purchase a fictitious heaven by a fictitious beneficence. The so-called "hard-heartedness of the poor toward each other" has always been the protest of human common-sense against the debasing and destructive use of wealth to relieve poverty by annihilating the sentiment of personal Responsibility. The honest poor know the value of the law "He that will not work, neither shall he eat."

The rich, who need not work, naturally yield to the temptation to excuse their own eating, by providing food for those who will not work. But the only true function of wealth is to provide for and to oversee work; the workers then take care of themselves.

The sense of Responsibility vitalizes the universe. Where it is lacking, society falls into anarchy, families into decay, and individuals into wretchedness; the genius frustrates his own career, the father abuses his powers, the mother neglects her offspring, filial piety and civic fealty vanish away, and vice and poverty become the rule instead of the exception.

The root of all Morality is Responsibility, and its fruit is true Religion. Shall Benevolence then set itself to cut off the root and spoil the fruit? The Charity of the Future will grasp the idea of watering this root of Morality to reap the fruit of Religion. No good is done to the vicious poor until they are set with their faces heavenward; nor to the shiftless poor until they are taught the lessons of a personal independent responsibility. To inspire them with the wish, the will and the knowledge to take care of themselves, and their little ones, is the sole business of "christian charity."

The sentiment of Responsibility will not grow except in good society. That does not mean in fashionable high life (which is always bad society), nor does it mean in intercourse with the rich and notorious, with people of leisure and pleasure, statesmen and soldiers,

popular writers, orators and artists. It means that really good society which is everywhere enjoyed among the steady-living and the steady-working masses of mankind, where every social virtue is conscripted into service and disciplined by daily toil and family affection.

The sense of responsibility cannot be dinned or driven into the poor, by preaching and praying, almsgiving and commitments to houses of correction. It must be instilled and inspired by sympathy, counsel, judicious assistance and example. Like love it is not bought nor sold.

Like affectionateness too it is hereditary and transmissible from generation to generation. As the spaniel is the type and illustration of the descent of a cultivated attachment, so the watch-dog is the type and illustration of the stirpal growth of responsibility, under the uninterrupted influence of a habit of superintendence. The "family servant" has disappeared, only because the family itself has lost its homestead. It was the homestead — not the family — that bred its generations of menial caretakers.

Circumstances — not dictation ; the unvarying call for comprehended assistance from others — not any calculation of profit or pleasure ; these create and foster the growth of responsibility — in servants — in masters — in every creature. For it is often strongest and steadiest where unacknowledged and ill paid ; and it reaches its acme of intensity in the heart of the mother of an unconscious babe, or imbecile child, all hope of reward forestalled and barred out forever.

To rouse the dormant sentiment in the irresponsible poor, and to sow thereby the seed of it in the constitution of their unborn offspring, is the noblest task of benevolence and the only hope of the future. The task is set — the task is undertaken — by the new Organization of Charities.

Organized Charity requires: 1, a perfect census and registry of professional beggary ; 2, the subdivision of the whole field of beggary into small districts ; 3, complete intercommunication and mutual intelligence between each district and the rest ; 4, a resident superin-

tendent, a local corps of visitors, a district house, which should be a temporary refuge and place of friendly detention, as well as an office of observation and information; 5, a close alliance with the municipal police, not for the application of force in behalf of charity, but for the substitution of force by charity; 6, a close alliance with the medical profession, especially in their municipal duty; 7, a close alliance with the trades-people, manufacturers and merchants in each district or neighborhood; 8, a close alliance with clergymen, magistrates, trustees of benevolent endowments, hospitals and asylums; and 9, a perfect understanding with the overseers and jailers of houses of detention and correction, prisons and penitentiaries; so that, when confirmed vagabonds have resisted all friendly treatment, and been committed for correction, they should be taught perforce cleanly habits and industry, and be kept out of the public streets a sufficient length of time to make a new trial more hopeful.

The extension of this system, the success of which has already appeared in more than one city, to all the cities and towns of an empire, is sure to be made; and finally to the whole world. All the old forms of Philanthropy as a method for gratifying the pride of patrons, or appeasing the conscience of wrong-doers in anticipation of the Day of Judgment, are destined to a slow but sure decay and final extinction. But in all ages to come true Philanthropy must gratify itself by reasonable exercises; and more and more will it take on the aspect of Public Spirit,—that indescribable desire which the wise and just man feels to render back the benefits which he has received,—to bless future generations with the blessing with which past generations have blessed him,—to show his love to the Creator of his own happiness in the small, by enhancing the happiness of his fellow-creatures in the large,—to please his imagination with pictures of good deeds not limited to the short term of his own earthly life, but vicariously immortal, like his own soul.

Out of the sentiment of Responsibility as felt by men in their capacity of begetters and providers and by women in their capacity of nourishers and nurses, have pro-

ceeded the sentiments of religious veneration for an ideal Providence, and religious respect for a God of law and love. To cultivate religion among the lowest classes of mankind by appealing to an intellect in them destitute of the first principles of order, or to affections in them of which they are both constitutionally and habitually deprived, is a mere fatuous tradition of the trade of Theology. Rouse in them care-taking for themselves and painstaking for their relatives, and a new light of the knowledge of the great Care-taker of all will dawn upon them. Teach them to hear the call of familiar duty and to answer the prayer of husband, wife and child, and they learn fast enough to pray. The Organization of Charity is therefore destined to be the Reorganization of Religion.

As to the *Religion of the future* I have perhaps said in my Tenth Lecture all that it is safe to say. The progress of the physical sciences, of the material organization of society, and of its mental and artistic training, goes on before the eyes of the beholder. But who can see those mysterious undercurrents of sentiment which are depositing the spiritual strata in the ocean of the Time?

Nothing is so hard to discover as a tendency. It required a thousand experiments and most elaborately curious machinery to get the curve of a cannon ball through the air, and to show that every — the slightest — change of shape in the projectile produced some corresponding change in the trajectory. No soldier knows how the *corps d'armée* with which he fights is manœuvring. If the army be very great, the commanding general himself is often doubtful to which side the battle sways. How much less efficient must be the means of observation of the philosopher regarding the tendencies of his age in spiritual things?

It is noteworthy that every religious zealot supposes his own sect to be on the way to pre-eminence. His point of view being necessarily low down, and his horizon limited to the region in which his own creed is professed, he can frame no just comparison between its general acceptability and that of other creeds. His

prophetic hopes are merely ardent wishes. What his reason accepts as divine he takes for granted must become universal.

Every priesthood therefore forecasts the Destiny of Man in the shape of a Millennium when the work of propagating its peculiar dogmatic theology and special ritual of worship shall have been completely successful in all quarters of the globe. This, however, being equally true of the priesthoods of Buddha, of Mahomet and of Christ, and of all the divergent sects of each, renders the prophecy in each case vain, so far as it stands on its own merits as a prophecy of the Propaganda. There may be other reasons for considering the prophecy of success for one religion better than for the rest; but no reliance can be placed on the ardent wishes and earnest faith which inspire the prophecy in any case.

To learn the tendency of mankind in matters of faith, one must first consider that religious faith is a compound of morality and metaphysics; that is, of all that men suppose respecting God and his creation, Man's nature, and the well-being of Human society. If, then, a tendency towards certain stable views respecting one or other of these elements of religion can be clearly discerned, the whole religious tendency can be at least partially suspected.

If it be true that humankind is becoming more and more conscientious, just and temperate in common life, there must be a tendency of their religious sentiments towards the worship of a truly worthy God. If men and women in the mass are growing to be more humane and pitiful and mercifully just towards each other, their God is also growing kinder and more loving to them. By combining these two tendencies of human society we get as a resultant a direct gravitation towards the religion of Jesus of Nazareth; or, what may express it better, to that element which is common to Confutzeism, Mahometanism and Christianity, embodied in the Chinese motto "Thou shalt not do to another what thou should'st dislike him to do to thee," and in the Christian formula, "Thou shalt love the Lord thy God with all thy heart, and thy neighbor as thyself."

On the intellectual or metaphysical side, the tendency of the educated part of the race is directed at present by the physical sciences; and there seems to be no counteracting influence except that of mysticism. But mysticism is the metaphysical philosophy of human affections, protesting against the controlling dictation of the human understanding. Now if mankind be really educating their understanding to a more vigorous treatment of all the facts of the universe, the result seems inevitable, that the affections must be subjugated to calmer and juster contemplation of facts. Only that residuum of mystical philosophy will then remain which shall correspond to actual facts—after a thorough-going investigation of the universe so far as man's apparatus of discovery and criticism can reach it.

There is but one mystical fact outside the pale of scientific research, viz., the fact of intelligent self-existence. This of course can never be investigated by any scientific process, because it is itself the investigator. It knows itself to be; but how it came to be, it cannot know; nor by what means it knows itself to be. Its attributive powers it can study while embodied in those powers; but when disembodied—it vanishes instantly from the field of investigation. It can fancy what it pleases about itself, both while embodied and when disembodied; but it can understand nothing. In ages when the understanding had no physical apparatus, no store of already investigated facts to suggest and guide to fresh investigation, the fancy was at its highest and most constant and delightful or unhappy exercises; but in this age of complete and satisfactory occupation for the human understanding, with so much found out and so much to find out, man has neither time nor inclination for the amusements of fancy outside of the world of real life. Hunting in the forest has been given up as a regular occupation by those who have fertile farms and comfortable city homes and exacting business. So, in the mental world, men see too much flesh and blood to care for ghosts; consort delightfully with too many saints and sages in the body, to invent invisible angels; and are too much and too successfully dealing with act-

ual hells in a way of benevolence to take spiritual stock in a theological hell which no one ever was certainly known to go to or come from.

Medicine has dissipated the fancy of diabolic and angelic possession; botany and mineralogy have brushed the plush and dew of folk-lore off from human history; chemistry has unmasked magic; geology, geography and astronomy have invaded and occupied the fairest and wealthiest domains of the mystical imagination; and physics as the science of the invisible world-force has inoculated the human fancy itself with ideas of the unity, simplicity and unchangeable regularity of the entire realm of existence.

The tendency therefore to some sort of unitarianism, —not only antipolytheistic, and antitritheistic, but antitriunitheistic (except in a Sabellian sense)—is unmistakable, wherever popular education prevails; and when women are educated equally with men, both sexes must share, each according to its several nature, in a departure from the mysticism of the old prevailing creeds, and in a common tendency to make all religious feeling and conduct to consist simply in expressions of confidence in the providence of one God and of benevolence towards all his creatures. Religion will in fact become simply Morality and Philanthropy.

Two words will disappear—*Schism* and *Apostasy*—in their present religious sense. They will be recognized, socially, as effete *Schimpfwörter*, “Shame words” of two primary human rights—the right of the individual to freely “obey the witness in his own soul,” and the right of individuals to freely modify all organizations of social intercourse according to the necessities of inward and outward experience. When it comes to be recognized that God is adorable and lovable, but not knowable, an authoritative Church will not exist, Schism will cease to be Dissent, and Apostasy will be nothing worse than a woman’s change of name at marriage. When Theology expurgates the Syllogism from its creeds, the human heart can become theological, and the distracted brain settle down into rational and peaceful mysticism. The *personal equation* in all the physical

sciences being established, the *personal equation* in religion will be discovered and believed. If there be Seraphs and Cherubs in heaven, there must be both burners and shiners on the earth, and these will constitute the only two great sects, to one of which women naturally belong and into the other men naturally gather themselves. But the creed of both will be that unwritten Morality which binds the human soul to God, and that unwritten Philanthropy which binds all human souls together. Thus the Religion of the Future will in fact become merely the harmony of Morality and Philanthropy.

Mortality and Philanthropy?

For the mystic these are cold words. To the Christian intelligence they are words burning hot with man's gratitude for the past and confidence in the future. Words? No, not words—but names,—names for a new and future zeal for doing good. "Freely ye have received," they say: "Freely give." New names for Vital Godliness. Names for that boundless, absolute, ecstatic, self-sacrificing Love of the Father, which shone on the face of Jesus the Anointed and the Anointer; which has illuminated the faces of thousands of saints and martyrs who died calling on his name, and claiming the performance of his promise that the Truth should make them Free, with the glorious liberty of the Sons of God.

The Religion of the future will be Free Religion; in no antinomian sense; but in the sense assigned to it by the Type man; who went about doing good and preaching righteousness; healing the sick and casting out devils; saying that neither at Jerusalem nor on any other templed height God should henceforth be worshipped; but that God was a spirit, and should be worshipped in the human spirit, and with simple, fearless, practical, affectionate and independent honesty, inspired by a love of personal goodness (holiness), and confident of a happy end in the bosom of creative love. All creeds must simplify themselves into this creed of Jesus, and all mysticism become practical after his example.

The Destiny of Mankind becomes in this view the macrocosm of the destiny of each individual; and as

all personal religion resolves itself into the comprehension, love and practice of the fundamental principles of Christianity as set forth in the life of Jesus, with infinitely varied applications to the circumstances of personal existence,—so the religions of the human race must, in the course of ages, be reduced to the simplicity of the fundamental: Be God's child and Man's brother. No creed can stand the fire of modern and future science. All ceremonials must become merely symbolic. The relationship of clergy to laity will resolve itself into that of leadership to following, in purity of character and wise beneficence; and no rewards in heaven or punishments in hell will be either desired or anticipated; for Christ will have indeed come the second time to rule and bless the world.



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