

The Open Court

A MONTHLY MAGAZINE

Devoted to the Science of Religion, the Religion of Science, and the
Extension of the Religious Parliament Idea

Editor: DR. PAUL CARUS.

Associates: { E. C. HEGELER.
MARY CARUS.

VOL. XXI. (No. II.) NOVEMBER, 1907.

NO. 618.

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THE MONIST

A QUARTERLY MAGAZINE

Devoted to the Philosophy of Science

DR. PAUL CARUS
EDITOR



ASSOCIATES } E. C. HEGELER
MARY CARUS

"The Monist" also Discusses the Fundamental Problems of Philosophy in their Relations to all the Practical Religious, Ethical, and Sociological Questions of the day.

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THE MARRIAGE OF ST. CATHARINE.

By Parmigianino, 1504-1540. In the Pinacoteca at Parma.

Frontispiece to *The Open Court*.

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THE EVOLUTION OF CLIMATE.

BY LAWRENCE H. DAINGERFIELD.

Local Forecaster, Weather Bureau, Pueblo, Colorado.

CAESAR said, "All Gaul is divided into three parts." With equal truth one may say that all of the earth is divided into three parts, namely, the geosphere, or solid portion, the hydrosphere, or liquid covering, and the atmosphere, or gaseous envelope. Climate may be defined as the resultant of the influences of these three spheres, plus the external influence of the sun. Each, to a certain degree, coordinates and cooperates with the others in establishing climate.

The object of this paper is to show something of the interrelation existing between the solid, liquid, and gaseous parts of the earth and the sun, in part through the media of plant and animal life, and attempt to trace some of the prominent features of this relation from the hypothetical, original, nebulous condition of the solar system, up through the various geological eras, to the threshold of the present time. In other words, we shall attempt to trace, as far as possible, the evolution of climate, especially that of North America.

Far beyond the four great geological eras of our earth, the Cenozoic, Mesozoic, Paleozoic, and the Archæan, there existed, according to the nebular hypothesis, a vast, nebulous mass, consisting of an extremely attenuated and highly heated gas. This gaseous body included, in their nascent state, all of the chemical elements now composing the solar system; at first it was "without form and void," but after the passage of untold ages it ultimately assumed a globular shape, due to the mutual attraction existing between every atom in the system and the final condensation around a nucleus or common center. The diameter of the great vapor sphere, to be

called ultimately the "solar system," was undoubtedly somewhat greater than the present diameter of Neptune's orbit—5,580,000,000 miles. The solar nebula was subordinate to the vast, universal nebula, and was correspondingly insignificant. Dense, secondary nuclei formed in time, and were attracted toward the center of gravity; only a slight deviation to the right of the common center of the vast system was necessary to initiate a slow, rotary motion of the whole solar nebula. The rotation necessarily caused a greater deviation toward the right on the part of the dense secondary masses in their passage centerward. A more rapid motion in rotation was thus stimulated, and the nebulous sphere became an oblate spheroid, with its polar diameter constantly shrinking and its circumference at the equator continually expanding. Swifter and swifter whirled the fiery vapor, until a titanic, equatorial ring with a maximum density at some point in its periphery, separated from the parent body, broke and clustered around the secondary center, and Neptune was born. The cooling of the surface of the primary, caused a slow but constant shrinkage and a corresponding acceleration in rotation.

Old Neptune moves leisurely along his orbit at the slow rate of about three miles per second, and his sidereal period of revolution is one hundred sixty-five earth years.

The shrinkage continued and Uranus, Saturn, Jupiter, the Asteroids (the fragments of a spoiled planet), the Earth, Venus, and Mercury, each, in turn, were born, with an ever increasing velocity of revolution along their respective orbits, the earth's velocity being $18\frac{1}{2}$ miles per second.

In the far-off age when the earth was born, it existed only as an atmosphere, without either geosphere or hydrosphere—an atmosphere composed of all of the elements and many of the compounds which can now be found above, on, or within the solid lithosphere.

Some idea of the temperature of the atmosphere may be conceived when one considers that all of the solids and liquids now composing the earth were maintained at a temperature sufficiently high to hold them in the vapor state during the genesis of the world.

Untold ages sufficed to reduce the temperature of the gaseous world sufficiently to precipitate some of the elements and compounds to form a molten, central nucleus, and other untold ages elapsed before the surface of the molten sphere froze and formed a solid crust of intensely heated, igneous rock. Thus the Archæan Era was ushered in, and the earth's climatical and geological history began.

During all of the early history of the earth, axial rotation and

orbital revolution were progressing much the same as they do to-day: the moon had separated from the earth and had cooled much more rapidly than her progenitor, and was probably a fit habitation for animal life even during the earth's Archæan Era. The sun shrunk slowly from his progeny thus favoring and augmenting the refrigerating and condensing process.

In the earliest period of the Archæan Era, the earth's crust was blackened and charred; there was no water—no variation—nothing but the blistering, seething surface, under which the molten forces spent their fiery fury, and above which the vast, invisible ocean of poisonous vapor surged and played. The climate during that most primitive time was equitable from pole to pole; there was no change of season; the unspent, internal furnace radiated heat outward from the scorched surface equally in all directions; there was probably no circulation of air over the new-born earth, for the heat was uniform and a state of equilibrium existed. The dense and strongly acid atmosphere, filled with the water of future oceans, heavy with carbon dioxide, poisonous gases, and many of the most volatile elements and compounds, that exist as liquids or solids under less arduous temperature conditions, hung stagnant and lifeless above the fervid, alkaline earth. Thus it was in the beginning when extreme and uniform heat prevailed about a lifeless sphere; thus it will be in the end when intense and universal cold embraces an old dead world; the elements of each case are stagnation, equilibrium, chaos, death.

The ocean of stagnant air and suspended water vapor remained practically inert above the earth as long as the major portion of the heat came from within the charred surface, but when the crust had thickened, and the heat received from the sun exceeded that expended by the earth, then a vast change occurred. The poles became appreciably colder than the equator. The seasons went and came. The vast atmosphere was set in motion, due to differences in temperature over the dead world, and stable gave way to unstable equilibrium. Then the boundless vapor-ocean became visible as cloud, and eclipsed the arduous sun, and darkness covered the face of the parched and desert earth. The condensation continued and the first rain of heaven descended upon a thirsty, igneous earth, but long before this deluge could moisten the primordial hills and valleys, the surface heat burst the liquid bands asunder, and forced the vapor back to the clouds from which it came.

By degrees, the clouds hovered nearer and ever nearer, with the constant diminution of geothermic power, and then another

deluge came, amid the terrific flash and crash of heaven's artillery, and water covered the face of the earth in that far-off, twilight epoch. Thus, for the first time, the earth was complete in a three-fold sense. The geo- or lithosphere struggled beneath a boiling hydrosphere, and above the latter surged the torrid atmosphere, many times exceeding in volume, density, and number of constituents the thin, residual gas in which we live and have our being.

In that early Archæan ocean, no living creature could exist, and the boiling point was probably maintained in the ocean's bottom through a vast age as time is reckoned. Climate, in its fullest sense, is hardly applicable to the conditions existing during that ancient era, since life had not then broken the bonds of its chrysalis, and was not subject to climatic vicissitudes.

By degrees the world-wide ocean cooled, and the crust settled about the shrinking sphere, causing flexures in thin and weakened places, and the first mountains raised their igneous summits far above the Eozoic sea, and became the nuclei of future continents. Then the sea began its erosive struggle of leveling the eructant structure and depositing the sediment upon the sunken floor. (When sedimentary rock was formed, a new formation came into existence—the metamorphic. Fire, pressure, and highly heated water are the principal agencies by which igneous and sedimentary rocks are metamorphosed).

The Archæan continent of North America (Fig. I) formed the outline of the present continent. The desert, Laurentian stone extended like a great arch around the future Hudson's Bay, with smaller land areas constituting the nuclei of the Appalachian system on the east and the Cordilleran on the west of our future Republic. The upheaval and subsequent growth of the land areas of North America profoundly influenced the climate.

Prior to the upheaval of the primary rock above the level of the sea, oceanic climate had reigned supreme. The climatic zones had existed as parallel, latitudinal belts from the equator to the poles. There had been, of course, a constantly growing difference between the climatic conditions of the Torrid, Temperate and Frigid Zones, but the divergence was not so marked, even during that primeval era, over a water-covered sphere, as it would have been had the primal rocks never been emersed. But from the day that the first rock ridge divided the Archæan Sea, dates the decadence of a purely oceanic climate. The embryo of the complex, continental climate came into existence contemporaneously with the Archæan land-surfaces. That embryonic climate grew into childhood during the

Paleozoic era, reached adolescence during the reptilian, Mesozoic era, gained manhood with the advent of the Glacial age of our era, the Cenozoic, and will reach senility when a frozen, lifeless earth revolves about the embers of a dying sun.

Mountains are the "benchmarks" of future continents. And as the Blue Ridge range in the East, and portions of the Rocky Mountain range in the West, divided the waters of the Archæan Ocean, they surveyed the general trend of the future North American Continent. The Canadian uplift, being somewhat general, might be considered an epeirogenic movement of the earth's crust. The first foldings of the eastern and western boundary lines were orogenic, or mountain-making movements.

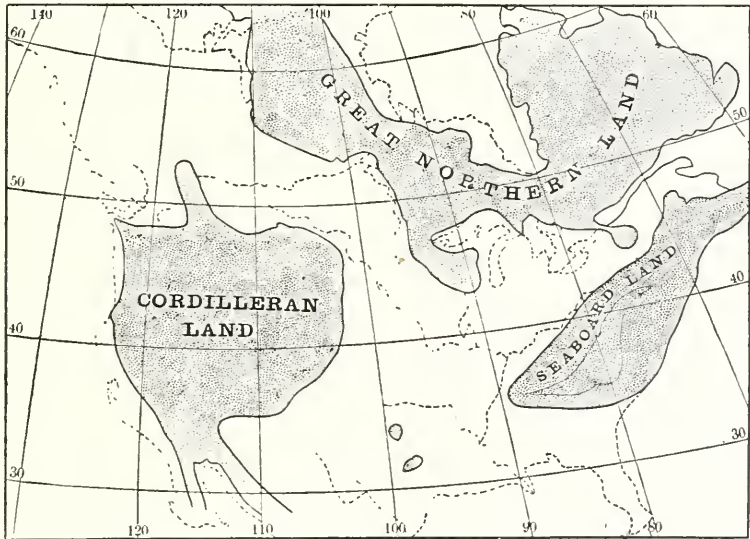


Fig. I. THE EZOIC OR ARCHÆAN CONTINENT OF NORTH AMERICA.

That portion of the American continent which was above the level of the sea at the close of the Eozoic era, before the dawn of life. (After a drawing by Alexander Winchell.)

During the Archæan era the earth's surface retained much of its initial heat. The temperature of the earth at the time heating by convection ceased, is estimated by Professor King to have been 3600 degrees (F) above zero. When the temperature fell below 3600 degrees, the transfer of heat was accomplished principally by conduction to the surface and by radiation from the surface of the earth. When the diffusion of heat by convection ceased, and the transmission of heat by conduction to the earth's surface began, we

may consider that the Archæan era was ushered in, which event, according to Professor King, was about 24,000,000 years ago.

Refrigeration continued uninterruptedly and comparatively rapidly during the Archæan era, and the warm, nascent sea, which was at first strongly alkaline or basic, greedily combined with the acids of the air, and salts were formed, giving to the oceans their saline principles.* During the millions of years that elapsed between the morning and evening of the Archæan era, the primitive rock surface, cooled from the fusing point until the ocean bathed the fervid earth; the water grew in saltiness and lost its alkaline principle with passing years; the backbone of the North American continent grew and was denuded by æolian and aqueous processes, and the detrition was spread out in ever thickening layers over the ocean shallows; refrigeration at last reduced the water of the sea to a temperature suitable to an humble form of life, and the dead Archæan world passed into geological history with the advent of the Paleozoic era.

The dawn of life occurred in the Cambrian period of the Paleozoic era. As might be expected, life was both tropical and aquatic. Imagine if you will the diet of the Cambrian arthropodæ and mollusks; their menu was surely far from elaborate. There was a twofold reason for placing the earliest form of animal life in the water of that ancient sea: (1) No air-breathing animal could exist in the Cambrian climate. The air that circulated above the tepid ocean was full of carbon dioxide and numerous other noxious gases which prohibited the separation of the life-giving oxygen from the death-dealing constituents. No man can ever know just what many of the ancient gaseous constituents may have been for many of the less volatile have long since entered into chemical unions, while hydrogen, that very light gas, has either joined its affinities—other elements—or fled outward into that great ocean of waste matter—ethereal space—to possibly accumulate around larger heavenly bodies, the centrifugal force of the earth's rotation having overcome gravitation. (2) The earliest forms of life were very simple, and it is extremely doubtful if those backboneless creatures could have

* Some of the alkaline compounds, the hydroxides, found on the surface of the earth or in the sea were NaOH, KOH, Ca(OH)₂, (quicklime), Mg(OH)₂, and others, no doubt united with the acids then in the air in great quantities, such as HCl, H₂SO₄ and H₂S (thrown out in large quantities by volcanoes together with HCl), etc., to form salts, for instance NaOH+HCl=NaCl+H₂O; KOH+HCl=KCl+H₂O; (NaOH)₂+H₂SO₄=Na₂SO₄+2H₂O; CaOH₂+H₂SO₄=CaSO₄+2H₂O; Mg(OH)₂+2HCl=MgCl₂+2H₂O; Mg(OH)₂+H₂SO₄=MgSO₄+2H₂O.

long survived a rugged existence on the desert, storm-beaten rocks of the Cambrian land surface.

Among the humble forms of life found in the Cambrian Sea were the foram'ini'era, sponges, grap'tolites, corals, brachiop'oda, tri'lobites, ostracods', phyl'locar'ida, worms, pelecyp'oda, and gastrop'oda, most of which were shell bearing, and all invertebrates and without red blood. The world was not then a fit abode for the higher forms, and Deity placed the lowly invertebrates in the sea while preparing the land for higher and better types of his creation.

During the succeeding period, the Lower Silurian, the first, armored fishes appeared, some of which found a cemetery near Cañon City, Colorado. The early armored fishes show a gradual

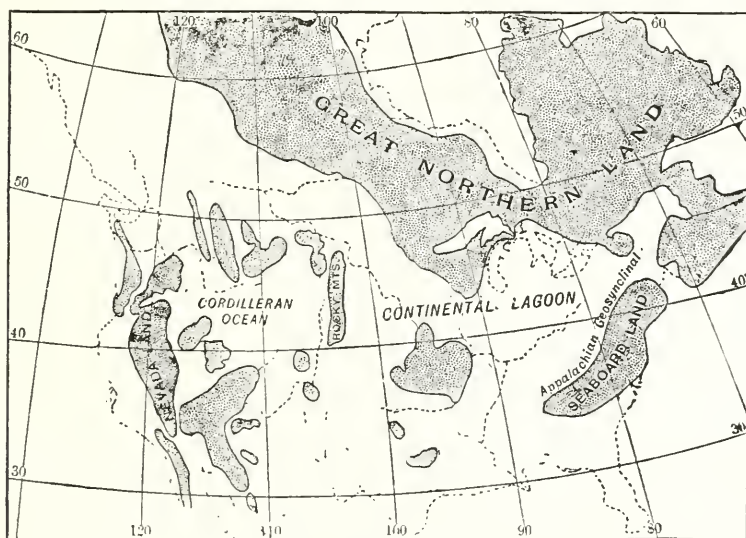


Fig. II. THE SILURIAN CONTINENT OF NORTH AMERICA, as it appeared at the close of the Silurian period in the midst of the Paleozoic era. Invertebrates had lived in the ancient sea principally prior to the Upper Silurian period, but the vertebrates appeared during the period named above in the form of fishes. (After a drawing by Alexander Winchell.)

transition from the earlier shelled animals to the later vertebrates, being entirely without endo-skeletons, i. e., the armors served as skeletons.

The succeeding period, the Upper Silurian, produced armored fishes in vast numbers, which were contemporaneous with the ammonoid'æ, shelled animals, similar to the nautilus; the ammonid'æ were prolific during the Devonian period, when fishes much like those of

to-day, and great toothed sharks became the monarchs of the world, showing a gradual upward trend in animal creation.

The land area had grown during the Cambrian and Silurian periods, (Fig. II), the belt around Hudson's Bay having widened materially; the Appalachian system had grown, but much of the Archæan land area in the western part of the continent had subsided leaving only island-like formations above the sea. Volcanic action was prolific, and added steam, sulphurous gases, sulphurated hydrogen, hydrochloric acid, methane, carbon dioxide, and much heat to the dense, poisonous atmosphere, forcing animals to linger longer in the sea. The time for the air-breathing animals had not arrived.

Tropical climate is indicated for regions in the present Frigid zones by the presence of fossils of Silurian and Devonian coral reefs.

Plant life had existed contemporaneously with the animal forms, or even before in the Archæan era (both on land and in water), but not to such an extent as during the great Carboniferous period, which followed the age of fishes.

Much of the interior of the future United States was under water up to the beginning of the Carboniferous period; then the continent rose slowly and lifted parts of the Appalachian region, and the future states of Ohio, Indiana, Michigan, Kentucky, Illinois, Iowa, Missouri, and Kansas slightly above the surface of the ocean, and vast swamps, filled with the sediment of erosive action of unnumbered years, became suitable hotbeds for a luxuriant, flowerless, tropical flora. Great ferns, lycopods, calamites and cycads flourished in the carboniferous swamps and lowlands, and drew from the air much of the super-abundant carbon dioxide (CO_2). That the climate of North America was not only tropical but remarkably uniform is evidenced by the structure of the Carboniferous tree trunks—little change of season being shown. The rank and marsh-loving plants of the era indicate abundant rainfall.

Many elevations and subsidences of the Carboniferous lowlands occurred, each exhibiting a vast accumulation of plant life which formed the coal measures.

Amphibious animals appeared in large numbers, and hopped or crawled under the shadows of the sigillarians and lepidodendroids in the silent solitude of the first inhabited forests, thus indicating that the air had become sufficiently purified to support a low form of air-breathing animal.

The amphibians of the Carboniferous and Permian periods were of the order *Steg'ocepha'lia*, which shows a gradual transition from the dominant fish-life of the late Paleozoic era, and the higher rep-

tilian orders soon to appear (Fig. III). The young stegocephalians had true gills, and the full grown were covered with an armor of overlapping, bony scales. They were carnivorous or flesh-eating animals, as is shown by their pointed, cone-shaped teeth, and were the *first four-footed* vertebrates and were equally at home on the land or in the water. Their very form and nature demonstrate that conditions above the surface of the sea were not quite favorable for a permanent abode on terra firma, and that the air was not quite adapted to the use of air-breathing animals, living exclusively above the surface of the water. A gradual improvement in conditions on the land is shown by the fact that a sub-order of Stegocephalia



Fig. III. MASTODONOSAURUS AND HYPERODAPEDON.

Extinct European descendants of Stegocephalia. (From *Animals Before Man in North America*, by Frederic A. Lucas.)

shows marked increase in size and adaptation to an exclusively terrestrial life during the Permian period, which followed the Carboniferous, individuals of the sub-order having attained a length of ten feet—the largest of the American amphibians—and a much greater length was attained by the adults of an European sub-order.

In the jungles of that far-off, Carboniferous period lie buried the carbon remnants of an atmosphere once heavily laden with carbon dioxide. Never again was rainfall to be so universally torrential; never again was plant life to be so luxuriant and prodigal. The dense, tropical flora of to-day is only a faint reminder of the

verdure of that distant period, doomed to fall in tangled masses, and sink beneath the erosive deposits of the relentless sea, and become the vast storehouses of heat and locomotion for the inhabitants of a chilled and far more rigorous world.

Differentiation in climate is shown near the close of the Carboniferous period by the fact that conifers—cone-bearing trees—the greatest of the four living groups of the gymnosperms, appeared in the far frigid zones. The conifers are adapted to a colder climate, and are far hardier trees than was the Carboniferous verdure represented by the lycopods and kindred plant life. The slow encroachment upon the tropics of the conebearers plainly indicates the gradual but almost imperceptible refrigeration of our globe.



Fig. IV. THE PALEOZOIC CONTINENT OF NORTH AMERICA.

Those parts of the North American continent which were above the Permian or Triassic Sea at the close of the Paleozoic or dawn of the Mesozoic era. (After a drawing by Alexander Winchell.)

The clarifying of the air by the Carboniferous flora, and the separation of the earth into better defined climatic zones, the gradual growth of land area around Hudson's Bay and the St. Lawrence valley and the Appalachian and Cordilleran mountain systems, (Fig. IV) marked the close of the coal-making period and the advent of the Permian. The consumption of a vast amount of carbon dioxide (CO_2) by the luxuriant plant life of the Carboniferous period, and the loss of much moisture from the air, favored an accelerated

radiation of terrestrial heat into interplanetary space. Consequently traces of glacial action are found which were made during the Permian period, in remote portions of the southern hemisphere, and even in the extreme northern portion of our hemisphere. Volcanic eruptions probably resupplied the air with sufficient carbon dioxide to check the too rapid refrigeration of the earth through radiation, and prolonged the life of the tropical flora and fauna in the temperate and frigid zones. That most ancient invertebrate, the Trilobite, passed away with many of his contemporary, backboneless fellow-creatures, and many others of his kind and time dwindled away and became subordinate to the ponderous sea, amphibious, and land reptiles, which became the monarchs of the earth during the strangest era of ancient times—the Mesozoic; even the fishes assumed a secondary place while the monster reptiles paddled through the sea, stalked upon the land, or stretched their membranous wings and soared above the marshes and jungles of the ancient past.

The warm, moist Permian climate of North America was ideal for the amphibians and they became the languorous monarchs of their age. But the upward trend of life could not be long impeded, and the reptiles appeared, showing many amphibian characteristics, but also added higher types. The reptilian innovation intimates further improvement in climatic and vegetal environments. Many of the reptiles were herbivorous, probably the first herbivorous animals to inhabit the world. Many retained the carnivorous habits of their fish and stegocephalian ancestors. All types of animal life before the advent of birds and mammals were cold-blooded, i. e., the temperature of the invertebrates and fishes of the sea, the amphibians of sea and land, and the reptiles of the sea, land, and air, was little if any above that of the water or air in which they lived. The lungs of the reptiles were large, but lacked the innumerable, microscopic air-cells which are present in the lungs of birds and mammals. Being cold-blooded indicates that the aerating surface of the reptilian lungs for oxygenation of the blood was both deficient and unnecessary. What their lungs lacked in delicate and complicated structure was more than compensated for in toughness of texture and admirable adaptation to breathing the noxious air of the Permian and succeeding periods of the Mesozoic era.

The Triassic or morning period of the Mesozoic era marks the rise of the reptiles and the decline of an inferior class of creatures—the amphibians. Terrible and grotesque must have been many of the orders and suborders of the reptilian class. Mythical dragons and griffons could not have assumed forms more hideous than did

the monarchs of the Mesozoic era. The terrified amphibians and small reptiles must have fled before their large antagonists with ravenous, carnivorous appetites, to hide themselves in the slime under the somber shade and flowerless plumes of the marsh-loving,

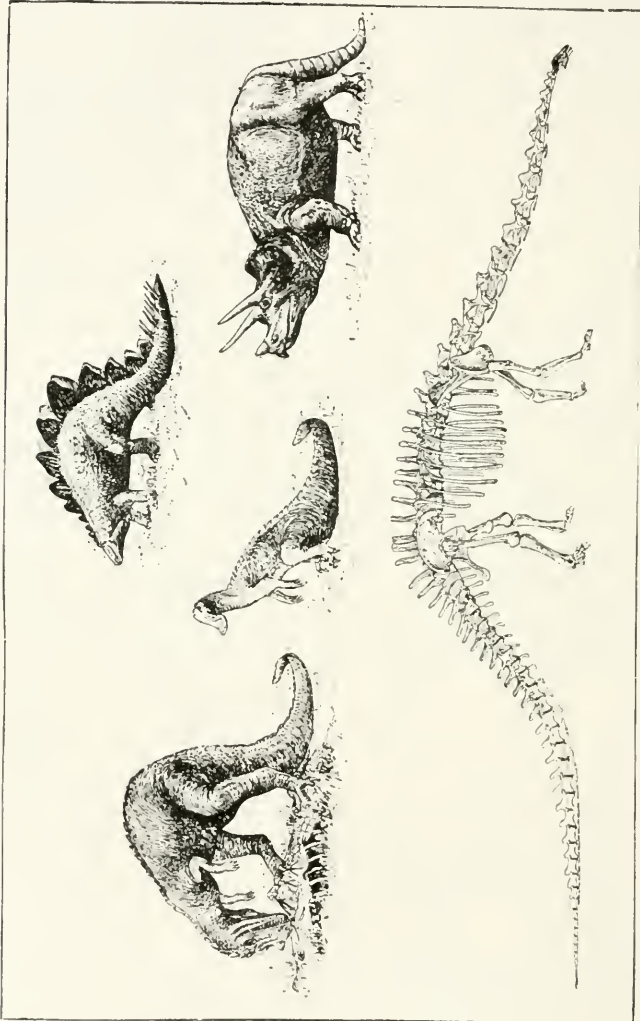


Fig. V. DINOSAURS.

Lowest figure: Skeleton of Diplodocus, (Order Sauropoda). — Left-hand figure: Ceratopsian, (Order Theropoda.) — Middle figure: Hadrosaurus (Sub-order Ornithomimidae.) — Right-hand figure: Triceratops, (Order Ceratopsia.) — Upper figure: Stegosaurus, (Order Ornithomimidae.) (Last four figures after drawings by Knight and Osborn.)

horsetail rushes. The great cycads, with their radiating, fernlike leaves, afforded friendly shelter alike to friend and foe—the one from an unnatural and sudden death: the other from the blistering tropical sunshine or torrential rain. Possibly some of the small and hardier types fled northward and wandered in the silent shadows of

the cone-bearing forests of a more temperate climate, free from the presence of their ponderous enemies.

The dominating types of both plant and animal life of that strange era were ponderous and somber. The giant, Mesozoic *Cyc'ada'ceæ* and *Equisetum* have since then shrunk to the lowly ferns and rushes; the terrible reptiles have shriveled to the insignificant snakes and lizards, or more pretentious alligators and crocodiles of the tropics. *Physically* the era was great—but life was either brainless or flowerless—Reptilia or Gymnosperm.

The largest of the dinosaurs, the herbivorous brontosaurus (thunder lizards), roamed the primitive marshes and lowlands of the present state of Wyoming, on the western border of the great Jurassic Sea, extending from the Arctic Ocean to the Gulf of Mexico. These great brutes walked on all fours (Fig. V), and their footprints covered a full square yard of ground. The adults attained a length of sixty feet, and their probable average weight was about twenty tons. The skeleton of the great brontosaurus in the American Museum of Natural History, New York City, measures sixty-seven feet in length, and the live animal, according to some authorities, would have "tipped the scales" at about ninety tons. Its brain would have weighed about as much as that of a ninety-pound child.

Through the tepid waters of the inland sea the ichthyosaurs and plesiosaurs paddled their massive bodies, while over forest and plain, mountain and sea, the pterodactyls soared with expanded membraneous wings reaching twenty feet from tip to tip—true "dragons of the air" (Fig. VI).

The mountains, foot-hills and vast plains were slowly rising above the sea of western North America during the Mesozoic era, but much of the eastern portion of the continent, extending as far west as Iowa and eastern Kansas, and south to the northern portions of Arkansas, Mississippi, Alabama, and Georgia, were above the water at the close of the Paleozoic, and much of the Appalachian system was growing old before the close of the Paleozoic, and was crumbling before the æolian and aqueous attacks extending through the Mesozoic era.

As the warm, moisture-laden air moved from west to east across the western archipelago, the great inland sea, the central valley low-lands, the Appalachian Mountains, and off the eastern seacoast, it yielded copious rain on the western land-masses, and was generously replenished with moisture taken from the ocean's arm that divided the continent, to again fall in torrents over the

eastern land area. The interior of the earth still rendered substantial aid in maintaining a tropical temperature over much of the temperate zone, while the sun was lavishly expending his radiant energy in prolonging the life of tropical fauna and flora far north of the present confines.



Fig. VI. THE PTERODACTYL AT HOME.

During the Cretaceous period, the evening of the Mesozoic era, tricer'atops, the last and noblest of the dinosaurian race, appeared. Already the reptile orders of sea, land, and air were experiencing a waning glory, and were yielding before races better adapted to the

changing vicissitudes of climate and resultant vegetation. Already *Archæop'teryx* (Fig. VII), the reptile-like bird, was usurping the domain of the pterodactyl and pteranodon. Already the first diminutive mammals were roaming through the first flowering pastures and blossoming woods, for the gymnosperms or flowerless plants were yielding to the angiosperms or flower-bearing vegetation. Refrigeration had brought the world forward to a more modern stage, but tricer'atops still roamed the marshes, hills, and plains, a stranger among strangers, a grand but forlorn representative of a decadent

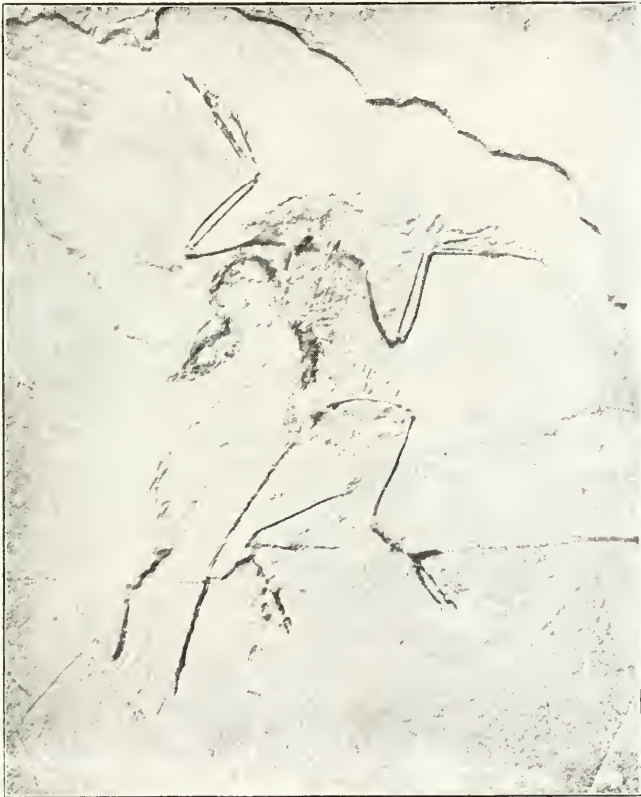


Fig. VII. ARCHÆOPTERYX.

The most primitive bird. (From the specimen in the Berlin Museum.)

race; he walked as do the quadrupeds, and the crowning glory of his twenty-five-foot body was his six-foot armored head, with three great horns or knobs ranging upward in a single row from near the point of his massive nose to the crown of his brainless head. But

tricera' tops died and joined his fellow dinosaurs. A diagnosis of the cause of his death would have been over-specialization, changing climate and vegetation, and to make room for a superior race.

Contemporaneous with Archæopteryx, the primitive bird with reptile-like caudal appendage, was Ctenac'odon, the earliest known mammal, found in the upper Jurassic stone of Wyoming; that diminutive creature was but little if any larger than a mouse, and an humble successor to the mighty horde of reptiles then in the fading twilight of their ponderous, physical ascendancy, and nearing their last, long degradation to the dust from which they sprang, or the consignment of their massive bones to the rocky matrix of nature's grand sarcophagus to become fossil history, read and pondered over by a far superior race of beings in a distant epoch.

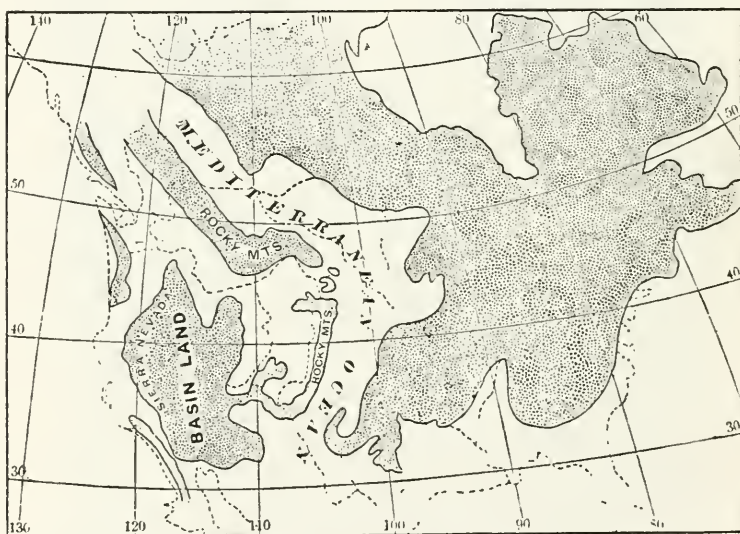


Fig. VIII. THE MESOZOIC CONTINENT OF NORTH AMERICA.

Those parts of the North American continent which were then above the Cretaceous or Tertiary Sea at the close of the Mesozoic or dawn of the Cenozoic (modern) era.

The North American continent at the close of the Mesozoic era showed further growth above the Cretaceous sea along the south-western border of the principal land mass (Fig. VIII), and the foot-hills and plains expanded out from the Cordilleras, and encroached upon the shallows of the ocean's bed. The great inland sea was gradually becoming a shallow strait, but still extended from the Arctic Ocean to the Gulf of Mexico over the present state of Texas, and embraced much of what is now Oklahoma, Kansas, Neb-

raska, the Dakotas, Colorado, Wyoming, Saskatchewan, Alberta, and Mackenzie. The rainfall no doubt was becoming less torrential, excepting possibly over the steep, western incline of the Cordilleras. Conduction, convection, and radiation had reduced the temperature of the land, water, and air, causing a further shrinkage of the tropical faunal and floral area. At the present rate of cooling, it is estimated that the interior of the earth loses eighty-one degrees (F) of interior heat in 100,000,000 years by conduction through the rocks to the surface, and radiation from the surface. But, no doubt, the early refrigeration of the earth was much more rapid than the present rate.

At the close of the Mesozoic era, the atmosphere probably possessed nearly the same elements and compounds as at present, but it was far more extensive. It was during this interval of the world's geological history that the cumbersome and brainless, ancient reptiles passed to their last long rest, leaving nothing but fossilized bones to prove their very existence. The mammals appeared in time to view the passing of the reptiles, and, in turn, became the kings of earth; they sprang from a lowly and insignificant ancestry, but culminated, as Deity ordained, in the birth of Man, which event probably occurred at the close of the Pleistocene Period of the Cenozoic era.

The passing of the great reptiles, and the advent of the mammals near the dawn of the Cenozoic era indicates changing environments. Changing climate and resultant vegetation were prominent factors in the transition in animal life and the vegetable kingdom. Decrease in temperature and precipitation caused the decline of the vast, tropical, swamp-loving flora, which was the food of many reptiles, while increasing frigidity drove the reptile horde equatorward or destroyed them utterly from the face of the earth, leaving behind them a small remnant of their hardy, diminutive representatives in the temperate zone, and a somewhat larger, fiercer progeny in the tropics.

Each of the four great geological eras represents well-defined transitions in plant and animal life, effected largely through changes in the meteorological elements, viz., the temperature, pressure, and humidity of the air; precipitation, or the amount of water excluded from the air; evaporation, or the amount of water excluded from the land and water surfaces, or by transpiration from plant life, and acquired by the air; the electrical condition of the air. The Mesozoic was the great transition era between the embryonic life of the Paleozoic and the more highly organized life of the Cenozoic era. The transition did not occur within a few short years, but millions

of years were required to exclude from the air many superfluous and poisonous gases, fatal to higher forms of life, and reduce them to the harmless liquid or solid state.

As the North American continent grew upward, and expanded its borders, the climate gradually grew colder and drier; the sky became clearer, humidity decreased, and evaporation was greater, even though the temperature was less. Consequently the jungles, bogs, and swamp lands shrank slowly or passed away as they do to-day, and the moisture-loving vegetation yielded to the sylvan or prairie flora. The ferns and cycads, and many of the monocotyledonous angiosperms retreated slowly toward the equator, while the deciduous forests of the temperate zone encroached upon the tropics, and the conifers, lichens, and mosses spread southward and intruded upon the temperate zone. As the climatic zones became more distinct, more local areas, forests, grasslands, and deserts, appeared, dependent largely on three atmospheric factors, namely, wind, moisture and temperature. Each local area was the habitat of its peculiar form of vegetation (and resultant life). Of the three climatic factors, rainfall was and is of prime importance, and where the air had less moisture, the trees of the forests became fewer, and park-like savannas, or plant societies showing transitional conditions between forests and grasslands, appeared; these losing their trees, gradually became the prairies of North America, which correspond to the pampas of South America, and the steppes of Europe and Asia. It is doubtful if deserts, as we know them, existed as far back as the beginning of the Cenozoic era, but if grasslands had been subjected to still further exclusions of moisture, through dry winds, such as blow over the Great Sahara, or through being far remote from the sea, as the interior of Siberia, or through being closed in by mountain ranges, as portions of Arizona, Nevada, Utah, and New Mexico, the third great society of plant life—the desert flora—would have inevitably appeared. Monotony rather than poverty characterizes the desert flora of to-day. The few species representing desert vegetation are well supplied with root-anchorage to draw moisture upward through the thirsty earth, while their leaf surfaces are small or entirely wanting, thus reducing transpiration to the minimum, and reservoiring the precious liquid within the plants' bodies.

About three million years ago, more or less, the Tertiary period of our Cenozoic era dawned, with the birds and mammals, the first warm-blooded animals, and the flowering plants (angiosperms) in the ascendancy. The birds were adapted to migratory habits then becoming necessary through increasingly distinct climatic zones and

change of seasons. The herbivorous mammals with their swifter means of locomotion and superior teeth were better suited to subsist upon the primitive grasses and cereals than were their ponderous, reptilian predecessors, while the hardy, cunning carnivorous mammals were equally well fitted to their sylvan homes. The clearing atmosphere permitted the sun's rays to fall in rich profusion over the flowering hills and valleys, and open wide the petals of the Angiosperms, inviting admiration from an unadmiring world, and enticing the passing insects to alight and taste the hidden nectars.

Eocene, Oligocene, Miocene, and Pliocene times of the Tertiary period were prolific in the development of thousands of mammalian species, many of which have long since become extinct through changing climate and resultant vegetation. Over 10,000 species of the sub-class, Eutheria, of the mammalian class, have evolved from the Tertiary animals, and live on the earth to-day. Physically, the genus *Homo*, or man, belongs to the order of Primates, of the sub-class Eutheria of the class Mammalia, and of all the mammals that have come forth from the Tertiary period to live during the Quarternary period, or age of man, the Ungulates, or hoofed beasts, are the most useful.

The epidermis of all mammals produces a covering of hair, or modified hair in the form of bristles or even scales, while the Aves, or birds, are equally well protected with feathers, of epidermal origin. These modified, epidermal growths are well adapted to protect the dominant animal life from the vicissitudes of climate. The seasons were well marked before the close of the Tertiary period. By the end of the Pliocene time, the North American continent was practically clear of the Tertiary sea, and was yielding to the grasp of the frigid zone. Temperate zone fauna and flora were forced southward to the tropics or died at the touch of the chilling, arctic breath. Precipitation in the form of snow covered the earth where the luxuriant vegetation of a tropical climate had flourished. The ice congealed around the lily and the iris, and the frost of winter robbed the trees of their foliage. And then the Quarternary period broke, with all its fury, upon a world hitherto languishing in a spring, summer, autumn, or tempered winter sun, and this was the advent of the Glacial or Ice age. The massive sheet of snow and ice grew and spread until it enveloped Canada, New England, the St. Lawrence valley, the Great Lakes, New York, New Jersey, Pennsylvania, and the vast region extending from the Ohio to the Missouri River. Down the slopes of the Rocky and Sierra Nevada mountains the glaciers descended into the valleys, and over the

plateaux, while over Alaska and British Columbia there extended a universal ice sheet. Five times was the glaciation of North America accomplished, and six times was all of northeastern Europe covered with the sheet of ice, during the Pleistocene period.

A very plausible explanation* of the refrigeration and glaciation of the Northern Hemisphere follows: The eccentricity of the earth's orbit is subject to secular variations. At times the orbit is more elliptical than on other occasions. When the orbital eccentricity reaches its maximum, the earth is 14,000,000 miles nearer the sun during perihelion than in aphelion, causing a difference of 20% in the amount of direct heat received from the sun between these two positions. At the present time midwinter occurs in the Northern Hemisphere when the earth is in perihelion, or the closest point to the sun, but through what is called the "precession of the equinoxes" the midwinter of the Northern Hemisphere will occur in aphelion, or the farthest point from the sun, in about 10,500 years.† If during the Ice age the earth's orbit had assumed its maximum eccentricity of 14,000,000 miles, and the northern midwinter had occurred in aphelion, or the farthest point from the sun, then the winter's length would have been increased by twenty-two days, and the summer's shortened by an equal amount. The Northern Hemisphere would have received one-fifth less direct heat from the sun, daily, during the long, cold winter, but one-fifth more daily during the short, hot summer. The difference between the length of the two seasons would cause refrigeration, and the hot summer would be too short to melt the constantly accumulating ice and snow of the aphelion winters of the Pleistocene age and glaciers would have been the inevitable result. If the earth's orbit had retained its maximum eccentricity during the Pleistocene period, the precession of the equinoxes would have carried the earth to aphelion during the northern midwinter every 21,000 years, and caused periodic glaciation of our hemisphere, thus satisfying the evidences of repeated glacial periods.‡

The great ice sheet profoundly changed many of the lesser de-

*See Croll's *Climate and Time in their Geological Relations*, and *Physical Cause of the Change of Climate During the Glacial Period*.

† The northern midwinter would occur in aphelion in 13,000 years except for the fact that the major axis of the earth's orbit makes a complete revolution in about 108,000 years in the opposite direction to the equinoctial motion, thus shortening the precession period by about 2500 years for a semi-revolution, or 5000 years for the complete revolution of the equinoxes.

‡ The before-mentioned glacial action in high latitudes, following the Carboniferous period, was probably due to causes similar to those just mentioned.

tails of our continent. As the glacial mass moved southward from the Laurentian highlands of Canada, across the St. Lawrence River, it dammed that outlet of the Great Lakes, thus raising their water-level about 500 feet, and turning the water from Lake Ontario southward through the valleys of the Mohawk and Hudson Rivers. A closing of the outlet of Lake Michigan turned the water of that lake southwestward through the Illinois River, and thence through the Mississippi to the Gulf of Mexico. An enormous, temporary lake was formed during the Glacial period which extended from Minnesota and North Dakota far northward into Canada and exceeded in area the combined surfaces of the Great Lakes. Even the preglacial lakes were expanded, rivers were deepened and widened, and many of the small lakes of New York, Wisconsin, and Minnesota were created through the erosive action of the glaciers.

During the interglacial epochs, the fauna and flora would follow the ice sheet northward, to be again driven backward to the tropics and the southern temperate zone when the great, ice Juggernaut again migrated southward. Five times the glaciers and the organic life fought back and forth across the continent, and then the ice sheet retreated to the mountain tops, or far northward to Greenland and the Arctics, to become the present remnants of their past glory, and temperate and frigid zone fauna and flora either ascended the mountain sides or migrated to their natural habitat in northern latitudes.

The faunal and floral reclamation of North America was probably coincident with a lessening of the earth's orbital eccentricity, and the approach of a northern perihelion winter, i. e., midwinter when nearest the sun.

The increase in terrestrial temperature at the close of the Ice age may have been augmented by another cause, according to the theory of Professor Frech.* He argues "That there is a parallelism between the maxima of terrestrial temperatures and the maxima of volcanic activity, and that there is a simultaneity between the glacial epochs, and the minima of eruptive activity." In other words, the volcanoes are responsible for the major portion of the carbon dioxide present in the atmosphere. Carbon dioxide in the air prevents the rapid radiation of the heat energy from the earth, acquired through the radiant energy of the sun. Plant life constantly consumes carbon dioxide, thus robbing the air of its initial charge of this important gas. The luxuriant vegetation of the Carboniferous and succeeding periods would have necessarily reduced the charge of carbon

* See *Monthly Weather Review*, p. 31, January, 1903.

dioxide, and caused more rapid refrigeration, and the work of recharging the air would have devolved upon the volcanoes. If the supply from this source fell below the demand of vegetation, refrigeration and glaciation would have resulted as demonstrated in mild form during the close of the Paleozoic era and in the severe type of the dawn of the present or Quarternary. "The diminution of eruptions in the last portion of the Tertiary period runs parallel with the diminution of heat; the glacial epoch (precisely as in the case of the Paleozoic cold period) is to be recognized by an almost perfect cessation of eruptive activity, but the present epoch by a renewed activity."* From the above statements it is reasonable to conclude that the diminution in volcanic activity and the resultant decrease in atmospheric carbon dioxide assisted in the refrigeration of the earth during the Glacial period.

Some idea of the enormous work done by volcanoes may be conceived when one considers that, besides raising the temperature in their immediate vicinity, they throw out vast quantities of lava, steam, sulphurous gases, sulphurated hydrogen, hydrochloric acid, methane and carbon dioxide. Krakatoa in 1883 is said to have ejected 4.3 cubic miles of solid and liquid matter, besides an enormous quantity of highly heated and noxious gases. Pelée, during certain days in May and August, 1902, ejected material in bulk, greater than the sediment discharged by the Mississippi River in a full year—7,500,000,000 cubic feet. The recent activity of Mt. Vesuvius is a painful reminder of their capabilities.

When the great ice caps had disappeared, and the plant and animal kingdoms regained their ancient homes, many of the older types had passed to their long, last rest, and hardier, brainier genera and species appeared, among them the genus Homo, the climax of creation. Man has come down through the Rough, the Smooth Stone, and the Bronze ages, to the Iron age, advancing by slow degrees through the stages of savagery, barbarism, and civilization, to the present stage of enlightenment. But throughout the traditional and written history of the human race, climate has shown but little change. The view just stated is held by Prof. Willis L. Moore, Chief U. S. Weather Bureau, from whom I quote as follows:*

"Notwithstanding the popular notion to the contrary, there is reason to believe that there has been no appreciable change in the climate of any large area within the period covered by authentic history. Changes in the surface of the earth may be noted within

* See *Climate: Its Physical Basis and Controlling Factors*, p. 17.

the lifetime of an individual, that are thought to prove that a change in climate has taken place, when the alterations may be due to the persistent action of freezing, thawing, rainfall, and flood. Great changes have occurred during geologic periods, but it is the opinion of the writer that they take place so slowly that thousands of years must elapse before their effect is measurable."

The past life of man is as yesterday compared to the unnumbered years stretching far back to the earliest era of creation, when "the earth was without form and void," and who can tell but that the evolution of climate is surely and slowly progressing toward a definite end. Stop to think that the mass of our present atmosphere is only five quadrillion tons or $\frac{1}{1200000}$ of the earth's mass; that after the solid portion of the earth was formed, the air contained all of the water vapor, now constituting the oceans, lakes, and seas, amounting to 1,300 quadrillion tons, or $\frac{1}{4540}$ part of the entire earth. At that time the water vapor alone was 260 times the present mass of the entire atmosphere. Consider how the air has shrunk through all the years until it has become a thin residual of the vast, primitive atmosphere.

Through the millions of years to come, science tells us that the earth will rotate more slowly, through tidal friction, until the same face will ultimately be turned constantly toward the dying sun. The attenuated atmosphere will become yet more tenuous, and finally, in the far-off end, all gases will turn to liquids, and the liquid shell will freeze upon or within the surface of a cold and lifeless sphere.

"When the sun grows cold,
And the stars grow old,
And the leaves of the Judgment Book unfold."

ST. CATHARINE OF ALEXANDRIA*.

BY THE EDITOR.

WE have seen in a former article ("The Bride of Christ," published in *The Open Court* for August) that the tradition of the bride of Christ has its ultimate foundation in the myths of pre-Christian saviours; but we noted at the same time that according to the rigidly ascetic traditions of the early Church this marriage was to be a purely spiritual and symbolic one; and that the legend finally crystallized around the name of Catharine the pure one, in spite of the incongruity of the age in which the best known saint of this name was supposed to have lived. In the domain of myth as well as legend we move in an atmosphere that is above time and space, and so there is no inconsistency in the fact that St. Catharine of Alexandria lived at the end of the third century, more than two hundred years after the death of Jesus. This discrepancy only helped to denote the entire absence of carnal love which fact is further emphasized by representing the mystic marriage usually (though not always) as taking place between the Christ child and an adult virgin.

As to the historical facts of St. Catharine's life a critical investigation of ancient records yields no result. From a purely scientific standpoint St. Catharine of Alexandria is an unhistorical figure, but for all that the legend is quite circumstantial in details.

Catharine is reported as being of royal parentage and as having received an unusually good education. She is revered by the Church as the patron of philosophy, science and learning, and some philosophical schools, as for instance the University of Paris, have selected her as their tutelary saint.

The legend further asserts that Emperor Maxentius, anxious to establish the truth of idolatry, arranged a public debate between

* We have tried to make the illustrations in this article and the preceding one on "The Bride of Christ" as complete a collection as possible of reproductions of valuable paintings which have for their subject St. Catharine or the Mystic Marriage; and we wish to acknowledge herewith our indebtedness for the very great assistance toward this end which has been rendered ungrudgingly by members of the staff of the Chicago Public Library.

her and the most prominent pagan sages, but she defeated them in every way so as to humiliate their authority. Incensed at her success the Emperor first tried to influence her by threats and flattery, but when he saw that nothing could move her, he ordered her to



ST. CATHARINE.

By Ghirlandajo, 1449-1494. In the Borghese Palace at Rome.

be tortured on a spiked wheel, and then to be beheaded. The date of her martyrdom has been fixed on November 25, 307.

The oldest reference to St. Catharine is made in the *Menologium Basilianum*, a collection of legends compiled for Emperor Basil II who died in 886. In this she is called Aikaterina, and the report runs as follows:

“The martyr Aikaterina was the daughter of a rich and noble prince of Alexandria. She was very beautiful, and being at the same time highly talented, she devoted herself to Greek literature as well as to the study of the languages of all nations, and so she became wise and learned. And it happened that the Greeks held a festival in honor of their idols; and seeing the slaughter of animals, she was so greatly moved that she went to the King Maximinus and expostulated with him in these words: ‘Why hast thou left the living God to worship lifeless idols?’ But the Emperor caused her to be thrown into prison, and to be punished severely. He then ordered fifty orators to be brought, and bade them to reason with Aikaterina, and confute her, threatening to burn them all if they should fail to overpower her. The orators, however, when they saw themselves vanquished, received baptism, and were burnt forthwith, while she was beheaded.”

The report of the *Menologium* has been elaborated in other versions of which we have two in Greek, one by Simeon Metaphrastes (10th century), another by Athanasius. Upon the latter the Latin legend of St. Catharine is founded, from which again all later versions in Italian, French, and Old English have been derived. We must make special mention of the version made by Jean Mielot at the request of Philip the Good of Burgundy, because in addition to the incidents mentioned above it contains the story of the mystic marriage of St. Catharine to the Saviour which, however, is believed to have been derived from an older source.

Marius Sepet tells us of the marriage of King Costus with Queen Sabinella and the birth of their daughter, Catharine, who from a tender age was most carefully educated in all the arts and sciences. She distinguished herself in all virtues, especially in wisdom and moral purity. King Costus died, and Queen Sabinella retired to Mount Ararat where she was converted to Christianity by Ananias, a godly hermit. When she tried to induce her daughter to adopt the new faith she defended paganism with all the arguments of profane science, and her mother was unable to convince her.

Catharine had scarcely reached her eighteenth year when the grandees of the empire sought her hand in marriage and her mother was anxious to have her choose a good husband who would be a worthy leader and could protect the kingdom against all its enemies.



By Andrea del Sarto. 1486-1531. In the Cathedral at Pisa.

But Catharine refused all suitors and said: "Bring me a bridegroom who is as learned, as beautiful, as noble, as rich,—in short, is of equal rank with me, and I am ready to accept him for my husband." The story continues in the modernized version of M. Sepet as follows:

"One evening when mother and daughter lay sleeping together, the Queen of Heaven, the glorious Virgin Mary, appeared to them surrounded by a great host of patriarchs, prophets, apostles, martyrs, confessors, virgins, and many other saints, all of whom shone in radiant beauty. The Virgin Mary approached St. Catharine and said to her:

"Look, my daughter! all these are kings, and indeed the greatest in the kingdom of my Son, the Emperor of Glory. I know that thou art still unwedded. If thou wouldst have any one of these for a bridegroom choose the one which best pleases thee and I will bring it about that thy desire shall be fulfilled!"

"But St. Catharine answered that she did not wish to marry any one of them. Thereupon Jesus Christ himself, the Emperor of Glory, appeared unto her in the presence of his gentle mother and a countless host of angels. Mary, the Blessed Virgin, said to Catharine, 'Wouldst thou choose this one for thy Bridegroom?'

"And when Catharine beheld his beauty, power, and wisdom, she fervently replied, 'Yea! Him do I desire whosoever he may be,—him and none other.' But Sabinella, her mother, looked at her with astonishment and said, 'How darest thou select for thy bridegroom one whom so many kings obey? Be content to choose one of the other nobles for thy husband, for all are great and mighty princes.'

"But the daughter sighed and answered, 'Dear mother mine! blame me not that I should wish this one for my husband, for I see none here who far surpass myself in all things excepting him alone. Oh, go at once and seek out the Empress, his mother, that she may soften his heart and that he may accept me as his bride, for if I may not be his handmaiden, I will never marry another.'

"The mother went at once to that lady and offered her daughter to her as bride for her son, the Emperor. The Queen of Heaven and of the angels then spoke to her well-beloved Son, 'Dearest Son, desirest thou this maiden for thy bride?' But he answered, 'No, my Mother, I desire her not. Rather remove her from thee, for she is not a Christian. I am the King of Christians, and must never have a pagan bride. But if she will be baptized, I give her my word

that I shall betroth her soon afterwards by giving her a ring as to my spouse.'

"After this miraculous vision had vanished, Queen Sabinella and her daughter awoke and told each other what they had seen as an actual occurrence. But from this time on Catharine wept constantly and said that she would nevermore find rest until she had received the Emperor of Glory as her husband. Impatient to be



THE HOLY FAMILY AND ST. CATHARINE.

By Luca di Signorelli. 1441-1523. In the Pitti Palace at Florence.

baptized she urgently besought her mother to take her at once without delay to the godly hermit, and her request was complied with.

"When they had come together to the hermitage the mother told Ananias privately the vision as related above. The pious hermit, suddenly enlightened by our Lord Jesus Christ, called Catharine and her mother and said to them. 'The Emperor whom you have seen was our Saviour Jesus Christ and the Queen was his mother,

the glorious Virgin Mary. The hosts which you saw with them were their companions, the angels and saints of Paradise.'

"The godly hermit added that if Catharine wished for her bridegroom this Heavenly King whom she saw in her vision, she must needs become a Christian."



THE HOLY FAMILY AND ST. CATHARINE.

By Giacobbe Francia.

The story tells how Catharine became a pious Christian and received baptism at the hands of Ananias, after which follows an account of the mystic marriage.

“Once, when St. Catharine was praying fervently in her chamber, Jesus Christ, the King of Glory, appeared before her, clad in fine apparel and accompanied by a great throng of angels and saints. As testimony that he accepted St. Catharine for his bride he placed a real ring upon her finger and promised to perform great things for her if she would remain faithful in her love, and when our Lord Jesus Christ had disappeared she knew at once that vision was to be understood in a spiritual sense. She was completely converted to a great divine love and reverent tenderness toward Jesus Christ, her spouse. From this time forth she often received great tasks of consolation from him, and in order that she might take comfort in him more fully she consecrated all her time and all her study and meditations to prayer and the reading and contemplation of Holy Scripture. As formerly she had studied most zealously and had become learned in vast numbers of volumes of profane science, now, after her conversion she applied herself to the books of Holy Scripture, especially to the writings of the Evangelists, giving to these her attention above all else. She said to herself: ‘Alas, sinner that I am, how long have I wasted my time in the darkness of profane books! Oh Catharine, here is the Gospel of thy spouse. Put all thy heart upon its teachings as faithfully and constantly as thou canst in order that thou mayest attain the light of truth.’

“Reflecting day by day within her own heart, and questioning also day by day the servants of our Lord Jesus Christ, with whom she loved to speak of him, she became a wonderful teacher of truth. Some say that the ring with which Jesus Christ had wedded her was received and preserved in the City of Alexandria, of Egypt, after the death and passion of Madame St. Catharine.”

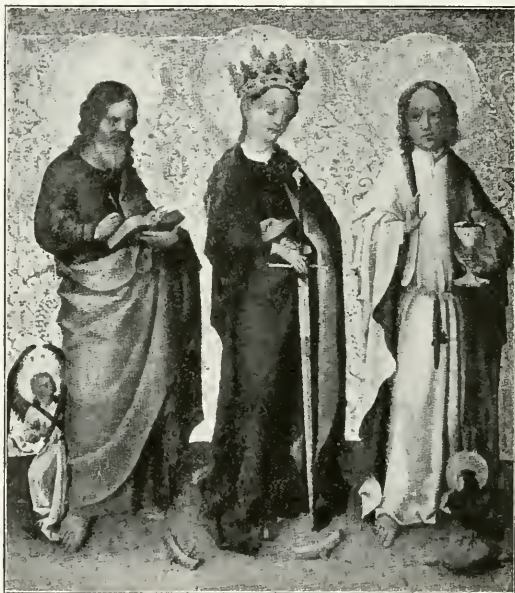
We have not been able to compare this modernized version with Marius Sepet’s manuscript, but we would be interested to know whether the original contains mention of St. Catharine taking cognizance at once that “the vision was to be understood in a spiritual sense.” In apparent contradiction to it are other passages which insist on the reality of both the vision and the marriage, in token of which a real ring is left on her finger. According to the ascetic atmosphere of Christian mythology the spirituality of this marriage relation is a matter of course and so the narrator of the legend impresses his audience with the belief that St. Catharine is not merely the bride of Christ in the sense that any nun may be so considered, but in the special and true meaning of the word.

In some versions of the legend it is claimed that when St.

Catharine was tortured on the wheel no blood came from her wounds, but milk, which is characteristic of her as the representation of absolute purity, because according to the Old Testament notion blood is regarded as impure.

The Roman Breviary for November 25, the day of our saint, contains the account of St. Catharine's life, as approved by the Church, and reads in the English version as follows:

"This Katharine was a noble maiden of Alexandria, who from her earliest years joined the study of the liberal arts with fervent faith, and in a short while came to such a height of holiness and



ST. CATHARINE WITH THE EVANGELISTS MATTHEW AND JOHN.
Ascribed to Stephen Master. Presented by Queen Victoria in 1863 in fulfilment of the wishes of the late Prince Consort, to the National Gallery, London.

learning, that when she was eighteen years of age, she prevailed over the chiefest wits. When she saw many diversely tormented and haled to death by command of Maximin, because they professed the Christian religion, she went boldly unto him and rebuked him for his savage cruelty, bringing forward likewise most sage reasons why the faith of Christ should be needful for salvation.

"Maximin marveled at her wisdom, and bade keep her, while he gathered together the most learned men from all quarters and offered them a great reward if they would confute Katharine and

bring her from believing in Christ to worship idols. But the event fell contrariwise, for many of the philosophers who came to dispute with her were overcome by the force and skill of her reasoning, so that the love of Christ Jesus was kindled in them, and they were content even to die for his sake. Then did Maximin strive to beguile Katharine with fair words and promises, and when he found it was lost pains, he caused her to be hid, and bruised with lead-laden whips, and so cast into prison, and neither meat nor drink given to her for a space of eleven days.

“At that time Maximin’s wife and Porphyry the Captain of his host, went to the prison to see the damsel, and at her preaching believed in Jesus Christ, and were afterwards crowned with martyrdom. Then was Katharine brought out of ward, and a wheel was set, wherein were fastened many and sharp blades, so that her virgin body might thereby be most direfully cut and torn in pieces, but in a little while, as Katharine prayed, this machine was broken in pieces, at the which marvel many believed in Christ. But Maximin was hardened in his godlessness and cruelty, and commanded to behead Katharine. She bravely offered her neck to the stroke and passed away hence to receive the twain crowns of maidenhood and martyrdom, upon the 25th day of November. Her body was marvelously laid by Angels upon Mount Sinai in Arabia.”

Note here that in the Breviary the pagan prince is called Maximin, while in the legend he is identified with Maxentius, who was beaten by Constantine in the battle of Saxa Rubra, and after his defeat was drowned in the Tiber. In this way the legend of St. Catharine had become closely affiliated with the final victory of Christianity.

According to Mielot St. Catharine addresses Christ in a prayer before her execution, and he answers her from out of a cloud with these words: “Come thou, my much beloved, come my bride! The gate of heaven is open to thee. The dwelling of eternal peace is prepared for thee and awaits thy coming. The glorious hosts of virgins descend with great rejoicing to thee with a crown of victory. Come therefore and be assured that I will graciously grant thee all those favors which thou askest. Yea I promise to extend all help, assistance and comfort which thou askest me also to those who in pious faith revere thy passion and will call on thee in danger and extremity. I promise to them all these benefits and the grace of heaven.”

According to the legend Mt. Sinai became the burial place of St. Catharine’s body, and Marius Sepet claims that the beginning

of the public worship of St. Catharine dates from the discovery of her tomb on Mt. Sinai in the eighth century.

He says:

"The worship of Catharine spread very rapidly among the



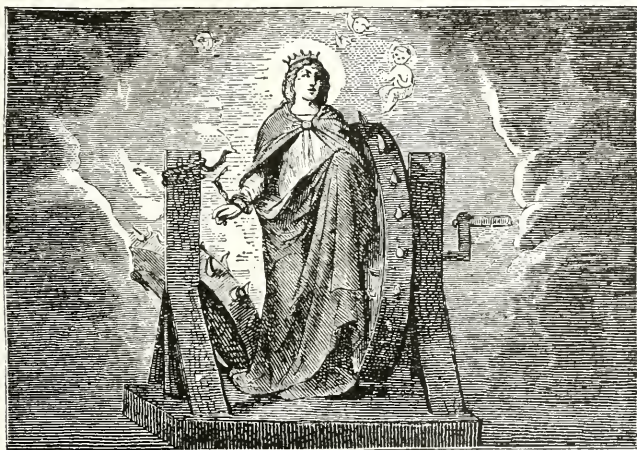
ST. CATHARINE'S DELIVERANCE.

From Mielot's *Vie de Ste. Catherine* as revised and modernized by M. Sepet.

Christians of the Orient and in the whole Greek Church, whence it penetrated into the Occident and was received also in the Latin Church. This happened before the crusades, for the French Na-

tional Library contains two manuscripts of the old Latin legend dating from the time of the first crusade. The crusades by encouraging and facilitating pilgrimages to the holy places of the Orient, have undoubtedly contributed much to the spread of the fame and the worship of St. Catharine, whose relics rest in a monastery on Mt. Sinai."

It is impossible to tell how old the legend of the mystic marriage may be, but it seems sure that as soon as it appeared on record it spread with great rapidity and became very soon afterwards well-nigh the most popular of all legends. Its popularity kept at its height between the fourteenth and sixteenth centuries, and we may not go astray if we assume that the currency of the unwritten tales prepared the rapid acceptance of the legend when it first made its appearance in literary shape.



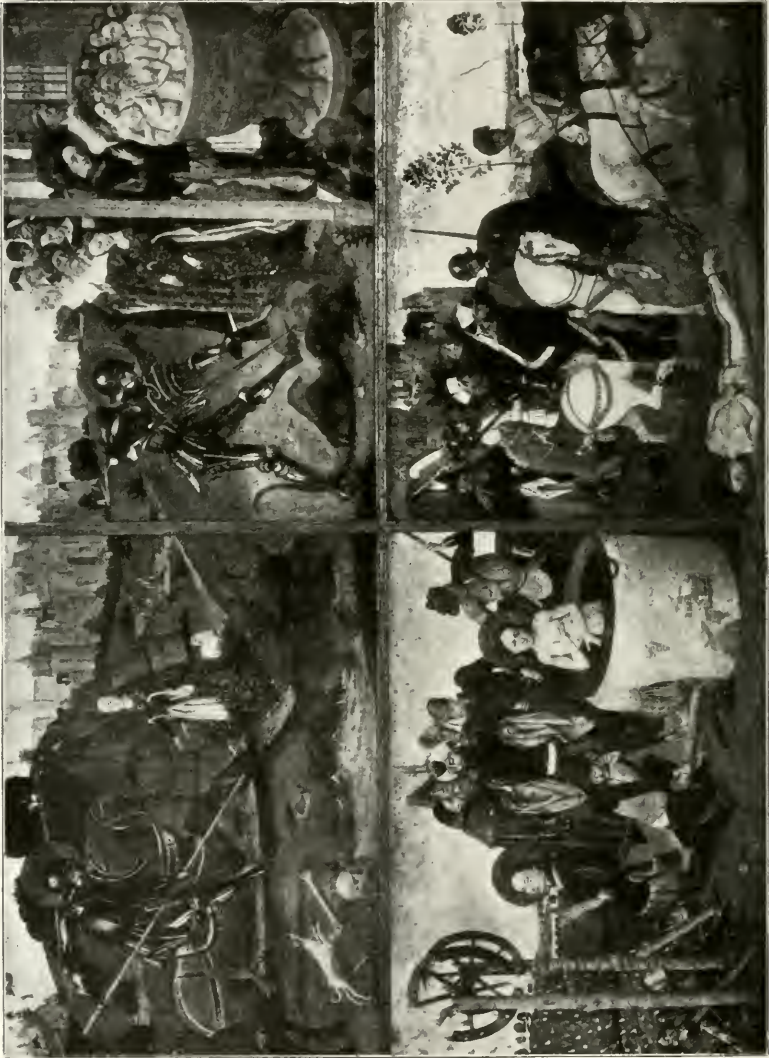
ST. CATHARINE'S MARTYRDOM.

From the *Little Pictorial Lives of the Saints*.

In ecclesiastical art St. Catharine is represented with a spoked wheel which in consequence of this is called St. Catharine's wheel. Frequently she carries in her hand a palm branch or books, both in token of the eminent position which she holds on account of her great learning. The most celebrated illustrations of her life are frescoes by Avanzi and Altichieri in the church of St. George at Padua, completed in 1377, and by Masaccio in the church of St. Clement at Rome made in the fifteenth century.

Not only are there many altarpieces in the churches of Catholics (and even some in Protestant countries) which have come

down from pre-Reformation times, but our art galleries also contain many valuable pictures of St. Catharine including representations of her mystic marriage. All of them bear witness to the

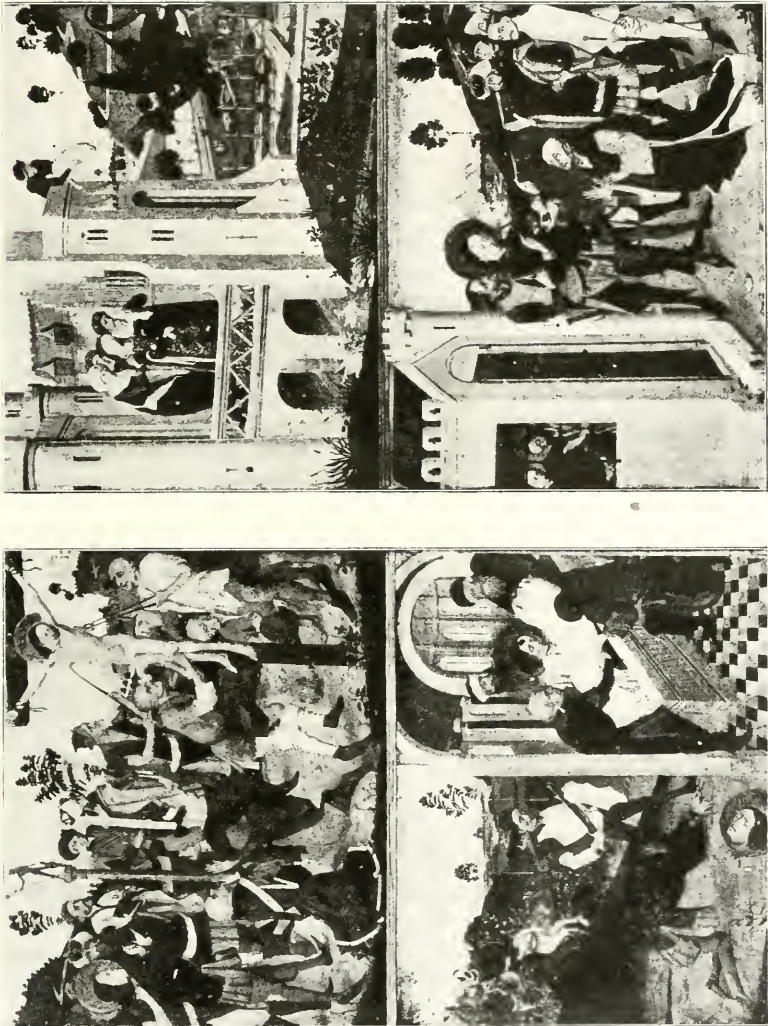


SCENES FROM THE LIFE OF ST. CATHARINE.
Artist known as the "Master of the St. George Legends."

tenderness with which the idea was cherished at that time all over Catholic Christendom.

The Art Gallery of Cologne possesses perhaps the richest collection of St. Catharines. Among them is a triptych, an altarpiece

consisting of a center with two wings, which contains a series of twelve illustrations of the life of St. Catharine by an unknown painter commonly designated as the Master of the St. George



SCENES FROM THE LIFE OF ST. CATHARINE.
Artist known as the "Master of the St. George Legends."

Legends. We see that even in this subject the artist remains faithful to his favorite topic, for he introduces the motive of the dragon fight into the Catharine legend.

[TO BE CONCLUDED.]

A CRITICISM OF MODERN THEOLOGY.

BY HERMON F. BELL.

NOT in criticism of traditional Christianity, whether that of the Apostles' Creed, of the Roman Church, of Calvinism, or of American Protestant orthodoxy, is the present article written. It is assumed that however vigorous these are in outward appearance or however widely held,—it is assumed that these traditional orthodoxies belong to the past, not to the future. So thoroughly have their premises been undermined that these beliefs will fall of themselves as soon as the more progressive churches and schools spread the results of modern study. But does this current liberal theology offer something better? Does it meet deep human need, or give strength to the faint-hearted in life's struggle? Our debt to modern Christian theology, such, for example as taught in Union Seminary, Yale, and similar institutions, is large,—so much so that it seems ungracious almost for these of us who enter into its heritage to speak the word of criticism. Yet this word needs to be said; and after all, will we not better prove ourselves worthy disciples of true scholars and devout men when we transcend their positions than when we accept their conclusions? They it is who enable us to pass beyond them.

Modern Christian theology is essentially negative. It is on the defensive. It is also illogical, but this is the result of its defensive position. Compelled to take away from the old theology continually, its endeavor is to retain the old terms and the old symbols and to show that they have value. There is lacking the all-compelling power of a comprehensive gospel that must be preached. The illogical position of modern Christian theology may be seen by a study of its teaching as to the Bible and as to Christ.

1. *The Bible.* Liberal Christianity makes the Bible the great subject of study. True it believes in the composite origin of the Pentateuch; in the Psalms as representing a great number of authors;

in the prophetic books as composite; and some, as Daniel for example, as very late; one at least, Jonah, as allegorical. It holds even that much of the Old Testament is colored by the prejudices, the fables and even by the jealousies and hatreds of the Hebrew people. As for the New Testament, the miraculous element is explained by natural causes or at any rate regarded as the less valuable part of the book. It is said that the part of the supreme worth is that which tells us of Christ. Do we ask why the Bible, not being infallible, is taken as the great book of religion, the answer given is that it is by reason of its witness to Christ.

2. *Christ.* Christ is not only the standard by which the Scriptures are judged, but he is the center of the theological and religious thought. He is not represented as the metaphysical second person of the Trinity. He is not believed in as the Creator of all things. At least, such expressions as are found in the prologue of John are either interpreted in a figurative sense, or treated simply as a part of the philosophy of that ancient time, which thus bore witness in its own terms to the moral supremacy of Jesus. Some believe in the Virgin Birth; some do not. Many are undecided. Nearly all agree that it is a question of relatively small importance. A few believe in the bodily, the physical resurrection of Jesus. The great majority do not, but believe in what they call the spiritual resurrection. This teaching concerning Jesus is certainly far from orthodox. How is it that Christ is, if anything, made even more than before the center of theology? It is said that we find Jesus to be supreme in the realm of morals and religion.

Modern liberal theology is Christo-centric because of what it finds Christ to be. It is Scriptural because the Bible best teaches us of Christ. And so, despite all the differences between the old theology and the new, the resulting changes in the worship of the churches or in the statements of religious belief are very slight. The Apostles' Creed can be repeated,—with a moral and religious rather than a metaphysical interpretation. The Bible occupies its old time place on the pulpit. Christ is still the center of religious thought and devotion. And this theology is professedly based upon the experience of the church universal.

The theology of a universal religion must be based upon the experience of the church universal. Notwithstanding its claim it is upon this very point that modern Christian theology is especially open to criticism. It does not rest upon universal experience. For one thing, it confines itself to the Christian Church; but in the church of the living God, we must include all who in all ages, have been

led by the Spirit of God. And who have been thus led? Certainly all who have achieved anything of goodness or had any visions of new life which they have carried forward to realization; for without God no man can accomplish anything. The experience of Moses and Isaiah surely counts for something; so does the experience of Socrates and Plato, to say nothing of the multitudes of true men and women unknown to fame. How contradictory then to appeal to the experience of the church universal to show that all that this church knows of God it knows through Jesus, when great numbers of its members lived before Jesus, and many of those who have come after never even heard of his name! How contradictory—unless the claim is that even though these patriarchs and leaders and teachers of men, both great and small, did not knowingly receive strength from Christ, yet it was in reality from him that they had power to be and to become sons of God. But modern theology makes this claim impossible by taking metaphysics from theology and resting its case simply upon the moral supremacy of Jesus. With its denial of a metaphysical Trinity—such as our fathers believed in—the new theology can no longer speak of Jesus as the light of every man coming into the world. It thus at one sweep shuts him out from communion with those who lived before he did, and also really denies its own great affirmation that all that the world knows of God it knows from Jesus. But perhaps it is not affirmed so strongly as this that all knowledge of God is through Jesus. Earnest men want the largest and fullest revelation of God it is possible for them to have. If Christ is not all, why make him the Alpha and Omega of theology and religion?

In reply to all this, perhaps it will be said that the Christian Church by its very existence, testifies to the present power of Jesus, or that the individual Christian to-day does receive strength from him, or that all the best that has been accomplished in the last two thousand years has been done under the influence of Jesus. There is considerable force to such statements. As a great historic person, Jesus has entered into human history and has left an influence that will not cease. Men to-day are made better when brought under the influence of Jesus. But so are men made better when brought under the influence of Lincoln, to take a single illustration. And it proves nothing to say that Lincoln influences men for good because consciously or unconsciously, he learned from Jesus, for so also Jesus received from those who lived before his time. Much confusion as to the present power of Jesus in the world to-day results from lack of clearness on the subject of the resurrection. What is meant by

a spiritual resurrection? Is it simply that the apostles thought they saw Jesus? Or is it that his influence has remained on earth? But it is true of all men that the good they do lives after them. Or did Jesus really appear in spiritual form? But if he appeared was it not in bodily form, for who has seen a spirit, or what is a spiritual form? Then, too, the question of prayer to Jesus or in the name of Jesus is here suggested. Prayer to Jesus if justified at all must be on the ground that Jesus is very God. Men pray only to whom they believe to be a present power. Is Jesus so present? Does he to-day restrain men from evil? Does he help them to be what they ought to be? Yes, he does, but none otherwise than by his example and his influence, as St. Francis does in his own degree. Unless we believe in a metaphysical Christ, who, like God, or we might say as God, is present, an indwelling spirit, how can we pray to Jesus? Modern liberal theology says Christ is not such a spirit, and yet it makes him the All in All of theology.

Modern theology is at fault in that it does not follow the logic of its own teachings. Either the conservatives are right and the new theology is wrong in its teaching as to the Bible and Jesus; or, if the new theology is right in the results of its scholarship it is open to criticism for still giving the Bible and Jesus the place it does. Modern Christianity has brought the Bible back from its infallible position and given it a place with the world's literature, but it continues to hold it apart from other books. It has taken the distinctively infinite attributes from Jesus, it confesses his limitations, yet it worships him and makes him authoritative;—and why? Because of his alleged sinlessness. But this sinlessness cannot be proven. We can no more speak of the sinlessness of Jesus than of the artistic perfection of Michael Angelo or Raphael. And every one knows that however great Angelo was as an artist, he was not perfect. He lacked some qualities that Raphael had, and *vice versa*. So Jesus lacked some qualities that Paul had. To say that by sinlessness we mean that Jesus did no wrong,—this is at best a merely negative statement. To say that he did everything that was right and that ought to be done, to say that he combined in perfect degree all good qualities,—this no man is able to assert. If the assertion is made, it is no more valid than the old proof for the infallibility of the Bible, namely, that when we read it we know that it finds us and we are inwardly convinced of the truth of what we read, hence every word, every part of the Bible is without error. It is a similar proof that is offered for the sinlessness of Jesus,—because this or that or all these incidents reveal his greatness and his goodness, the

conclusion is drawn that he was always without fault of any kind. If, however, any one prefers to appeal, as is often done, to the supposition that Jesus claimed to be perfect by word or by implication, let such a one remember that a similar proof for the infallibility of the Bible has proven inadequate. Unless Jesus perfectly and completely reveals all of God that we know, why make him the one leader, the one teacher, the one example? No man, not even Jesus, is great enough or wise enough, or good enough to be the sole authority in morals and religion.

Modern theology fails to meet the universal need not simply by reason of what it teaches, but far more by reason of what it neglects to say. It is at fault in confining itself to the Bible not so much because the Bible is not helpful as because there are other messages from God. To take one illustration. God spoke to the ancient Greeks in a way that He did not speak to the Hebrews or to any one else; and the Christian Church by taking no account of this message is neglecting the Word of God. To be sure, the Christian Church does not forbid men to study or to read these words spoken to other peoples than the Hebrews, but it does not, as a religion ought to do, stop men in the busy rush of life and say,—hold, here is a word of God for you. It does not in church or church school tell of that real Word of God which comprises all the great truths which courageous souls have seized upon down through the entire stream of human life. And God has sent us prophets even in recent years. There are Victor Hugo, and Goethe, and Browning, and Tennyson, and Carlyle with his message that might is divine because the only power that can accomplish lasting results is power that is righetous; and there is Emerson to teach us that self-reliance which is trust in the spirit within and above us. And there is Abraham Lincoln. As many lessons are to be gained by study of his life as that of David, who was taken from tending his father's sheep and made ruler over Israel. It is not enough once a year to suspend, as it were, religious exercises and preach a patriotic sermon on Washington or Lincoln, or of an evening to discuss the poetry of Browning or Tennyson. There is need of clear and emphatic witness to the great fact that the all-comprehending God has given us the enduring literature of all nations as His Divine Word. And this word asks not toleration, but demands its rightful place as the Book of the Church.

And modern theology fails in confining itself so much to the historic Jesus, not because his teaching is not helpful or his life inspiring, but because the Eternal Father, the Ever-present Spirit is

the one for whom our souls hunger and thirst. And He has not confined the revelation of Himself to one age or to one man. The Father Almighty spoke to Moses. He gave strength to Cyrus, His anointed. He made Cæsar the instrument of His will. He taught Demosthenes oratory. He gave Paul zeal for the Gospel he had experienced. He was the Father of Jesus and the God of Aquinas. He came to Mohammed in Arabia. He inspired Gautama with pity. Yes, and God is in the world to-day, the all real, the all vital, the all conquering fact of life. No mother's love but is token of a fuller love of God; no father's care but is from Him.

Did we think of saying that the Bible and Jesus adequately and perfectly reveal God? Millenniums of years and countless lives have told us only a little of His greatness and His goodness. Modern Christianity fails because it points men backward rather than forward for the ideal. The best is yet to be. Universal religion demands a universal Bible and an ever present God. Unless modern Christianity succeeds in showing the Bible, as at present, constituted to be absolutely unique, there must be a revision of the canon. Those who chose the present one are not competent to bind us to-day, any more than Ezra was competent to select the Gospels or the other New Testament books. How could he be when he lived before they were written? Unless modern Christianity can show as it has not yet done that Jesus, the historic man of Nazareth, is to be identified in a unique way with the ever present Spirit of God, it must cease to center around him. And it is not enough to appeal to the experience of the great body of Christians; for it stands to reason that even as one who had never traveled beyond his native country nor even read of foreign lands, unless with the object of becoming more firmly convinced of his own country's pre-eminence,—even as such a one would believe all the good to be within his own fatherland, and base his claim perhaps upon his own experience, so those who confine their religious reading to the Bible or books about the Bible, and their thought of God to Jesus (as the great body of Christians has done) would regard this book as pre-eminently the Word of God and Jesus the one authority and,—to prove these things, quote from their own experience. Nor can the burden of proof be shifted. It does not rest with such as the writer, but with modern Christians, because they are the ones who have themselves denied the infallibility of the Bible and the deity of Jesus. It lies before them either to present some valid reason for not accepting the logic of their own results, or else accepting it, to pass from Christianity to universal religion.

MODERN THEOLOGY: AN EXPLANATION AND JUSTIFICATION.

BY THE EDITOR.

MODERN Theology has undoubtedly its weak points, and Mr. Hermon F. Bell brings them out in his article "A Criticism of Modern Theology," published in the present number. We are glad that while criticising the science he studied, he at the same time gratefully recognizes how much he owes to it. We do not deny the justice of his criticism but we wish to say that there is another side to the question, and there are many things which can be said—we will not say in palliation of its faults, but certainly in their extenuation, which to an impartial judge will amount to a justification.

First we must consider that modern theology is in a state of transition. Its many inconsistencies are simply due to the fact that a reform can not attend to every detail at once. We build up and tear down, and while a new interpretation is growing traces of the old are still lingering with us.

There is, however, an additional reason for the inconsistencies of modern theology. Many theological thinkers see them all too plainly, but they know very well that the time has not yet come to declare from the housetops what they are willing to whisper into the ears of serious inquirers. If they were too frank in their utterances, they would give more offence than would be good for many people who are on the fence, uncertain whether perhaps all religion should not be discarded as a superstition.

Religious questions must be treated with great reserve, and students of a groping mind should be dealt with gently and with great consideration. This has necessitated the modern theologian to acquire the habit of writing between the lines much that he has to say, and the thoughts which he thus merely hints at are frequently the most important ones. It means that there are problems in modern theology which the professor is neither willing nor called upon

to solve for his students, but he must leave it to them to work out their own salvation.

The truth is that, so far as I can see, the development of theology is too rapid, and it would be better if it were retarded, for it would not be good for our social and public life if our religious convictions changed so quickly as to give the churches no chance to adapt themselves to the new conditions. They would go to the wall and a great institution which ought to be an enormous power for good would be lost thereby.

Incidentally I will say here that upon the whole the brake on the wheel of progress in the several congregations is not the clergyman but the vestry. The clergy as a rule have been confronted with the various problems of theology. To a great extent they are acquainted with the difficulties that beset their intellectual horizon, and they are more liberal than they dare to own in the pulpit. This statement should not be interpreted to mean that they are cowards, but only that they have sufficient tact not to unnecessarily offend the weaker brethren who have not yet grown into the stature of the freedom of the children of God. St. Paul's advice is heeded, that they should be treated with consideration, and there are many who still require milk and should not be fed with meat. It so happens that the most active members of the congregations, those who are at the same time the most ready to contribute to the support of their church, are exactly those who vigorously insist on adhering to the old traditions. These men are valuable and it would be a pity if they were to change their minds too quickly.

There are exceptions of course, and I have known vestrymen who work for progress, possibly a conservative progress, but then as a rule they are mostly in sympathy with the work of their pastor and constitute his best support.

We must also consider that the new theology has by no means been worked out to such an extent as to have led to a practical agreement. This appears, for instance, in a point upon which I would take issue with Mr. Bell. He seems to think that modern theology should discard the Christ idea and concentrate its sympathies on Jesus. I grant that many theologians, especially those of the most liberal churches such as the Unitarians, show a great preference for emphasizing the noble humanity of Jesus in contrast to the philosophical idea of Christ the God-man, but I take the opposite view: I prefer the Christ ideal to the Jesus of the Gospels, and am glad to notice that, though a minority, yet some very prominent theologians would side with me. Professor Pfeleiderer, for instance, in

one of his latest publications says very boldly and frankly that the "Jesus sentimentality must go."

There is no doubt but that the most important idea in traditional Christianity is the doctrine of an ideal man, a divine example, a God-man, a type of perfection. We ought to cling to the ideal, and not to the accidental personality which on account of a certain historical coincidence has become the nucleus around which the ideal has crystallized. A critical study of the Gospels will reveal to us that the best features of the Jesus picture are the traits that have been superadded to those data which may be regarded as historically best attested. Take, for instance, the words of Jesus on the cross, "Father, forgive them, for they know not what they do." It is one of the noblest expressions of a dying martyr, and yet it is a late addition which appears only in Western manuscripts, and there is little doubt but it has been inserted to prevent Jesus from falling behind the merit of Socrates, who when drinking the hemlock, bore no grudge against his enemies who had condemned him to death. All the events of Jesus's life which are positively historical indicate that his horizon was limited by the superstitions of Galilee, and it appears that he made his living by exorcising devils who were then assumed to be the cause of all diseases. The historical Jesus is not the man on whom future theology will have to rely, and it seems to me that there is more value in the so-called metaphysical speculations of the Christians frequently denounced as obsolete and hyperorthodox, than in the rationalizing liberalism of the praise allotted to "the gentle Jesus." Let us bear in mind that our religion is not called Jesuanity but Christianity, and that in the actual development of the Church the foundation has always been the Christ ideal, their interpretation of Jesus to the Christ ideal of their time—never *vice versa*. The narrative of the life of Jesus never played any significant part in the foundation of the Christ ideal.

I will add only one more remark. Mr. Bell accuses modern theology of being negative, and I will say that frequent attempts have been made to state the positive doctrines of the new conceptions of the Christianity which is now dawning on mankind; but it is natural that none of them has as yet found universal recognition, and these formulations of the positive aspect of the new Christianity must so far be considered as mere attempts, mere propositions, mere suggestions, the acceptability of which is still under consideration. It is neither desirable, nor can it be expected, that a positive statement should become the common property of all the progressive denominations within a short time. The churches are in a state of

fermentation and we must not be impatient. The period of growth, the period of clarification, must have its time and we must bear in mind that here philosophy will have to come to the aid of theology. The new Christianity will have to seek its foundation not in historical statements, not in special books, but in eternal truths. They may utilize historical material, but it will never provide them with the bottom rock on which they can build with safety.

If the Christ ideal remains a living force in the Church, we need not cling with such nervous anxiety to the figure of Jesus, nor be troubled whether it is historical or legendary.

Modern theology so far has made remarkable progress. The leaders in the movement have done wonderful work, and that their labors are not yet finished, that the solution of the problems has not yet been brought to a consummation is certainly not their fault, but is due to the difficulties that attend the situation.

Mr. Bell's very criticism of modern theology is an evidence that its seed is working most successfully in the hearts of the growing generation. He works on in the spirit in which he has been taught, and in his modest way he recognizes the fact. His article is instructive and I would even say true. I sympathize with his attitude and expect that our readers will do the same, but at the same time I feel that it would be unfair to let the accusation stand as if the shortcomings of modern theology should be laid at its own door. There is another side to the question and it is for this reason that I took up the pen to write a word of explanation of the apparent inconsistencies of modern theology.

WAS JUDAS A TRAITOR?

BY THE REV. JOSEPH C. ALLEN.

IT is very difficult to understand Judas Iscariot on the basis of the accounts of him in the New Testament. Even the writers of the Gospels, though they were not interested in psychological problems or in any history save that of the Master, were evidently perplexed at the conduct of Judas, and at a loss how to account for it. Luke gives striking expression to this perplexity, when he begins the account of Judas's bargaining to betray Jesus with these words (xxii. 3), "And Satan entered into Judas." Surely if demoniacal possession were credited at the present day, we should most certainly accept Luke's statement that an evil spirit entered into Judas Iscariot, as the only plausible explanation of the conduct that is charged against him. For the betrayal, according to all accounts in the Gospels, appears to be without any but a trivial and sordid motive, such as in modern times would incline us to think of Judas as a moral imbecile.

Again, we with the Gospel writers must be astonished at the sudden emergence of such baseness, the lack of development in disloyalty and treason. It was, according to Mark and Matthew, only two days at the utmost before the arrest of Jesus, when Judas went to the priests and bargained for his betrayal. There appears no evidence of his unfaithfulness prior to this time. Nor is any fault shown in his previous conduct and bearing, save in the Gospel according to John, where it is said (xii. 6), "He was a thief, and having the bag took away what was put therein." We must regard this statement with some doubt, owing to the silence of the other Gospels concerning it. But if Judas was an embezzler, or even a downright thief, there is a vast difference between such contemptible vices and what appears to be the basest, most pathetic treason known to history. Let us suppose that Judas betrayed his Master in order to avert the discovery of his thefts. Then he must have been a man

of such utter baseness of character that both Jesus and his fellow apostles would have seen through him long before this. John does indeed intimate that at least Jesus understood Judas perfectly (John vi. 70). Here however the author of the Fourth Gospel seems to be speaking as a theologian. But at all events, the apostles seem not to have discovered any serious fault in him before his great crime, save possibly petty thieving, and even this seems not to have been generally known among them. He must have appeared faithful to his Master in the many times of gloom and danger that the little company had experienced before this. When Jesus while still in Galilee told his disciples of the evil fate that would come upon him in Jerusalem, the disciples, it is said (Mark ix. 32), "understood not the saying, and were afraid to ask him," and (Matt. xvii. 23) "they were exceeding sorry." There is no hint that Judas was not amazed and saddened like the rest at the gloomy predictions of the Master. If he was at this time in his heart disloyal, or if he was a disciple of Jesus for selfish or unworthy reasons, would he not have deserted as soon as it appeared that his Master's course led to danger and ruin? So base a man as Judas appears on the face of the Gospel story to be, would desert Jesus, we should think, before he entered Jerusalem—especially if he had heard and believed the prediction that his Master would there encounter opposition culminating in disaster and death.

It is furthermore strange and almost incredible, that Jesus would choose among his twelve apostles a moral imbecile. Except in this instance, Jesus appears to have been a good judge of character. When questioned or addressed, even by strangers, he replies as much to the questioner as to the question. It is of course quite likely that this characteristic is exaggerated in the Gospels, for the happiest replies would be the best remembered. But there must at least have been a nucleus of fact within the exaggeration.

Significant too, in this connection, is the propensity of Jesus to nickname his apostles. He called one of them "Rock" (Peter)—probably with reference to his solidity of character and loyalty of spirit; and the epithet appears on the whole to have been well deserved. There were two others that he called "Sons of Thunder." It is evident then that Jesus paid particular attention to the peculiarities of his apostles. These twelve men were of his own free selection, apparently out of a much larger number of disciples (Mark iii. 13, 14). They must have seemed to Jesus just the sort of men he wanted for intimate and confidential relations with himself, and for the advancement of his cause. Why then would he choose one so base as the Judas

of these traditions, who would turn traitor for fifteen dollars or to cover up his pilfering? And if he made such a blunder at the start, why did he not, before it was too late, discover the true character of Judas Iscariot and expel him from the apostolic company?

While these difficulties confront us in the story as a whole, certain details in the evangelic versions of it are still more perplexing. In the first place, all the Gospels but Luke declare that at the Last Supper Jesus pointed out Judas as the man that should betray him. But if Jesus did actually designate the traitor, why was not Judas from that moment watched and prevented from leaving their company? Furthermore it is extremely difficult to conceive of Judas as proceeding any farther in his treacherous design, after he had been thus exposed. Superstitious fear if no other motive, would deter him, we should think.

But setting aside this designation of the traitor, we have the testimony of all four Gospels, that Jesus said at the Last Supper, "One of you shall betray me." If he did actually say these words, and if he meant them in the literal sense in which the Gospels interpret them, we should think he would take precautions against expected treachery. But it appears that he did not take precautions against treachery on the part of an apostle. Judas was apparently suffered to separate himself from the others. Then as he came with the soldiers, he knew just where to find Jesus. Now the most ordinary prudence would have prompted Jesus, if he suspected treachery, to change his camping place.

The Fourth Gospel meets these difficulties by the view that Jesus deliberately and consciously invited his fate. We are told in that Gospel, that Jesus knew the badness of Judas Iscariot very early—presumably at the time he chose him for an apostle. For the Master is declared to have said, "Did I not myself choose you, the twelve? and one of you is a devil" (John vi. 70). It is thus implied that Judas was chosen just because he was a bad man. And that Jesus sought his fate is indicated in these words: "I myself lay down my life, that I may take it again. No one took it away from me; but I myself lay it down of myself" (John x. 17, 18). In accordance with this conception that Jesus was inviting his fate, we are told that at the Supper he dismissed Judas with the enigmatic words, "What thou doest, do quickly" (John xiii. 27). And Jesus is represented as assisting, later on, at his own arrest. He goes forward to meet his captors, and announces to them that he is the one they are seeking (John xviii. 4-8). The traitorous kiss is wholly

omitted in this account, and it seems as if the traitor's part is superfluous under the circumstances.

But the Synoptic Gospels give us a different impression of the attitude of Jesus at this hour. They tell us that, instead of welcoming his fate, he prayed that, if it were possible in God's plan, he might be saved from it. It is reasonable to feel some doubt as to the literal accuracy of this statement, since it implies that Jesus prayed aloud and was overheard by his very drowsy companions. But this does not militate against the story's substantial truth as an expression of the feelings Jesus seemed to his disciples to show at this time. Indeed throughout the Supper and up to the time of his arrest, Jesus appears in the Synoptic accounts to be in great dejection of spirit; and this must have been indeed the case, because the tendency of the disciples would be to represent it otherwise.

It appears then, that the Gospel writers are themselves at a loss to understand the conduct of Judas in any sense that is consistent with the confidence Jesus bestowed upon him in choosing and retaining him as an apostle. If we would find a satisfactory solution of the problem, we must first sift the accounts of the betrayal, to determine what in them is most primitive, most essential, and most likely to be genuine reminiscence. First of all then, Matthew's story of the money transactions with the priests, the return of the bribe and the final bestowal of it (Matt. xxvi. 15, 16; xxvii. 3-10), must be rejected as unhistorical. All this is manifestly derived from a passage in Zechariah (xi. 12, 13). We may too, go farther to say that every story of a money consideration is probably pure invention. The disciples would never know what dealings Judas had with the priests. In fact, they could hardly know even that Judas had seen the priests.

We may consider too, as mere conjecture, the hint of a connection between the anointing at Bethany and the beginning of treachery on the part of Judas (Mark xiv. 3f.; John xii. 1f). Possibly, however, Judas may have been absent from the rest of the company for a while after this occurrence, and thus the rumor may have started.

The two stories of the death of Judas and purchase of the Field of Blood (Matt. xxvii. 5f.; Acts i. 18f.) are materially and hopelessly at variance, and are not mentioned in Mark or John. These stories may have arisen partly because of some purchase by the priests of a burying ground; partly because Judas from this time ceased to have any relations with the disciples and they did not know what became of him; in part again from the feeling that some

sudden and terrible death was due him for his crime. Furthermore, the story of the traitor Ahitophel's suicide by hanging (2 Sam. xvii. 23) is likely to be a source of Matthew's story of the similar suicide of the traitor Judas.

There remain the accounts of the betrayal itself, and of the prediction of it by Jesus at the Last Supper. It is possible that the historical kernel lies entirely in these predictions. That is to say, some dark hint of Jesus about possible treachery among his disciples, or of desertion in time of danger, may have given rise to this story that Judas Iscariot actually betrayed the Master. But this is only possible. All four Gospels and the Book of Acts concur in the testimony that Judas "was guide to them that took Jesus" (Acts i. 16). Here it would seem, if anywhere in the story, is genuine reminiscence. It would be more likely that the account of the predictions should be based on that of the betrayal, than that the predictions themselves should give rise to the story of the betrayal.

In the accounts of the betrayal, it is said that there came with Judas "a multitude with swords and staves." If it should present any difficulty, we may reasonably question the number; for in the darkness so few as a dozen or only half a dozen men might seem to the distracted disciples a crowd. It is declared in Mark and Matthew, that Judas came to Jesus, called him "Rabbi," and kissed him. Luke however is slightly at variance here, making it appear that Judas only tried to kiss Jesus, but was repelled by his Master's rebuke. But this difference in testimony is immaterial, except as an indication that here we have reminiscence rather than legend or baseless rumor. If the story of the betrayal were itself a legend, we might find a source for this detail of the kiss in the account of the assassination of Amasa by Joab (2. Sam. xx. 9f.). But if the story as a whole is true, we must accept the report that Judas actually did at least try to kiss Jesus. For the apostles could not fail to notice and remember how Judas greeted his Master and what signal, if any, he gave to the officers and soldiers; so that if the matter of the kiss were legendary, the true account would be found, besides the legend. As to the statement that Judas had told the men that accompanied him, "Whomsoever I shall kiss, that is he," this simply expresses what was inferred from the conduct of Judas at this time, and is therefore of no value as testimony.

We come now to the words at the Last Supper. The report that Jesus on this occasion predicted his betrayal by an apostle may be legendary, but it would seem on the whole more probable that he did say something of the sort. Concerning this Last Supper the

apostles must have retained very full memories, and the Synoptic accounts of what was said and done at that meal seem to be on the whole sober and reliable. But the actual words of Jesus were probably distorted in memory and tradition, to make them fit more closely the occurrences in Gethsemane. It is possible that he did not have in view any treachery on the part of an apostle, but such negligence, or cowardice, or blundering, as might cause his ruin. It may be significant that the Greek word (*παράδοσιμι*) that is here translated "betray," does not primarily or necessarily signify an act of treachery. It means *deliver*, and there are places in the Gospels where it is so translated. Here then the saying may fitly be rendered, "One of you will cause me to be captured."

But the designation of Judas as the one that should cause his ruin, is probably an accretion to the original story. As Judas did the thing that Jesus feared or expected one of the twelve would do, it would quite naturally be said that Judas was pointed out as the one that would do it. Furthermore, the influence of a passage in the Old Testament is here apparent. "He that eateth with me" (Mark xiv. 18), and "He that dippeth with me in the dish" (Mark xiv. 20), are obviously taken from one of the psalms (xli. 9), as the Fourth Gospel clearly indicates (John xiii. 18).

The story then, stripped of exaggerations and accretions, is as follows. Jesus at the Last Supper said, "One of you will cause me to be captured," or something of similar import. A few hours later, Judas came with officers and soldiers of the priests, to Jesus in Gethsemane, called him "Rabbi," and kissed him or attempted to do so. The men then seized Jesus and took him away.

It will be convenient at this point to consider some theories of a general similarity of character, with regard to the plan and motives of Judas. In these it is held that he did betray Jesus, and that with deliberate intention, but that his purpose was not a selfish or malicious one, but rather friendly than hostile. It has for example been conjectured by De Quincey, that Judas committed this crime in order to precipitate a conflict, from which he trusted his Master would emerge triumphant. But it is difficult to reconcile this theory, or others involving deliberate intention but a friendly purpose, with the representations in the Gospels and Book of Acts, and absence throughout the New Testament of any hint to support such a view. For if the motive of Judas was friendly to his Master, he would, it seems almost certain, confide in one or more of his fellow apostles, hoping, and with good reason, to enlist their sympathy if not co-operation. Then through these disciples that had learned his true

purpose, a more charitable opinion of Judas would be perpetuated, perhaps alongside those we now find expressed in the Gospels. Substantially the same objection applies, though with less force, to the theory of Neander, that Judas sought through the betrayal to put his Master's Messianic claims to the test, thinking that if he was truly the Christ he would be rescued by angels, but if not, he deserved destruction. Judas in that case would be more secretive; but, conscious of his high purpose, he could hardly help giving to others of the apostles some hints of the questions and plans that were in his mind; and in these revelations they would have material for a more favorable interpretation of his conduct. All this would be especially true, if Judas felt confident that his Master would be vindicated by the test; but if on the other hand he had a strong suspicion that the result would prove Jesus to be an impostor, he would not greet him with a kiss.

What theories remain to be considered depend in part on the fact that Judas Iscariot was not like the other apostles a native of Galilee, but of Judæa. The most radical of these theories reduces the whole story of the betrayal to a legend. The original tradition, it is supposed, did not account for the ease with which Jesus was captured; so Christian ingenuity exerted itself to find an explanation. Some passages from the Old Testament (most of which have already been referred to in this paper) suggested details of the legend. We know that when Jesus was captured, his disciples "left him and fled" (Mark xiv. 50). Judas may then have returned to his home and never again joined the Galilæan disciples, so that the legend of the betrayal would be conveniently fixed upon him. (Cheyne in *Encyc. Bib.*) This theory could only be accepted as a last resort, so skeptical is it of the Gospel traditions. The accounts of the Last Supper and the night in Gethsemane—peculiarly memorable hours, since they were the last that Jesus spent with his disciples during his mortal life—would be strangely meager and incoherent, if all references to the betrayal were left out.

Another theory has been succinctly stated as follows: "In all probability Judas, being of the district of Judah, while the rest were all Galileans, was not impressed with the Messianic character claimed by Jesus, and therefore, merely to obtain immunity for himself, committed the cowardly act of betraying him to the officers and soldiers of the priests that came with swords and staves to seize him and his followers." (Kaufmann Kohler, Ph. D. in *Jewish Encyclopædia*). This theory, amplified and possibly modified to some slight degree, gives a simple and natural solution of most of the

difficulties. We may suppose that while he was in Galilee Judas did not seriously question the Messianic claims of Jesus, but was in every sense a loyal disciple. But now that he was in Jerusalem, he viewed matters once again through the Judean atmosphere that he had known in his early years, and it did not seem to him that Jesus answered the necessary conditions for the nation's Messiah. However, he did not look upon him as by any means an impostor, but still revered him as a wise and good religious teacher. The betrayal was not a deliberate act, and during the Last Supper Judas had no idea that he would ever be guilty of such conduct. But after the Supper, and while for some reason the poor man was alone, he was seized by soldiers of the temple guard, who threatened him and put him into a terrible fright, till he consented, on consideration of his own safety, to conduct them to the place where his Master was spending the night, and to point Jesus out to them.

This theory, though satisfactory in other respects, meets a difficulty in the kiss that Judas, when he came with the soldiers, gave to Jesus. A man that was frightened into betraying one he held in veneration, would hardly, we should think, do it with a kiss. It is however conceivable, that this salutation was an expression of his sorrow and compunction for his cowardly conduct. Nevertheless it was in effect a signal to the captors of Jesus, and it seems unlikely that Judas would use this salutation if he was a traitor against his wishes and through extreme fear.

To meet this difficulty a theory is now offered that differs from the one just considered, by regarding the act of Judas as a blunder rather than a crime. Jesus, as it appears from both Mark and John, had at former times found it necessary to go into hiding from his adversaries. But now he was in their very midst, and great circum-spection was necessary on his own part and that of his followers. Until perhaps two days before the Passover, Jesus resorted to the Temple courts, and taught. And in the very boldness of this act, in the publicity of it, there was at first a strange security. Jesus was getting the ear and sympathy of many of the people, and on this account the scribes and priests hardly dared molest him. But the danger of his situation was increasing; and it appears (especially from John xii. 36 and from Matt. xxii. 37f.) that Jesus abandoned the Temple courts a few days before the Passover, and kept himself in seclusion. It seems quite likely that he intended to repair to the Temple courts during Passover week, and there make a public and explicit avowal of his Messiahship. At least the priests and scribes must have suspected such a move on his part; and as the

Passover drew near, they must have become exceedingly anxious to get him out of the way. And Jesus for his part must have realized that his danger was increasing every day, especially at night. There are indications that he was taking special precautions at this time against being captured at night. After the Last Supper, and probably for a few nights before, he camped on the Mount of Olives, instead of lodging as he had formerly done at a house in Bethany. One motive for this change may have been to decrease the danger of surprise and arrest. He appears to have taken another precaution. The disciples were to watch, lest he be surprised.

During these days of seclusion, Jesus according to the Synoptic Gospels appears to have spoken at great length about his second coming to earth and the establishment of the Kingdom. It seems probable, however, that some of these sayings really referred to his own immediate danger and the likelihood of his capture in the night. The frequent references to the "hour" and to the "night" would be more natural in this sense, than with regard to his second coming. For example, the following has a far more natural sense when we have substituted the term *thief* for "Son of Man," and understand the saying as referring to a possible capture of Jesus in the night: "But know this, that if the master of the house had known in what watch the thief was coming, he would have watched, and would not have suffered his house to be broken through. Therefore be ye also ready: for in an hour that ye think not the *thief* cometh" (Matt. xxiv. 43, 44). From this and other similar passages we may infer that Jesus instructed his disciples to be his body-guard and by turns keep watch through the night.

We come now to the words of Jesus at the Last Supper. It was more than likely that on that night the priests would endeavor to apprehend Jesus, since the day following would be a favorable time for him to go to the Temple and proclaim himself the Christ. Jesus, realizing the situation, was full of gloomy forebodings. The slightest carelessness or indiscretion on the part of the watchers, or of any of the apostles, might cause him to be surprised and seized. Was it not natural then, that prompted by his fears, he should exclaim, "One of you will cause me to be captured"? This saying and that about the denial may perhaps have come as one from the lips of Jesus, substantially as follows: "I solemnly warn you that this night, before cockcrow some one of you may ruin and disown me."

The supper ended, the company repaired to Gethsemane, their camping place. Peter, James, and John are detailed to watch, but they fall asleep, "for their eyes were very heavy." They should

have intercepted any intruders that might come toward the Master; but by sleeping at their post they helped bring about his ruin.

Meanwhile Judas Iscariot, for a presumably proper reason, was tarrying in the city. If as the Fourth Gospel intimates, he was treasurer of the little company, he may then have remained behind to make some necessary purchases or to pay some bills. And we might conjecture that this office was entrusted to Judas just because he was a Judæan, and so could deal the better with the people of Jerusalem. But on the other hand his Judæan origin would make him somewhat reckless in his intercourse with the people of the city. His closer ties of tribal relation and of dialect would dispose him to friendship and familiarity with the Jerusalemites, whereas it would seem to him that the disciples and even Jesus were somewhat prejudiced against these people and inclined to be over-suspicious of their purposes. Furthermore it is possible that Judas in this Judæan atmosphere had come to have doubts whether Jesus answered the requirements of the nation's Messiah. At all events he would think somewhat differently from his Galilæan associates, and be inclined to set his own judgment against the cautions of his Master. So on this night, when two or three Jerusalemites come to him and ask that they may see and talk with the Rabbi, Judas assumes that their purpose is friendly, and so consents to be their guide. These men were, however, officers in disguise; and some soldiers were following them at such a distance that Judas would not observe them. On this Passover night, when so many were leaving the city for lodging places in the vicinity, a force of perhaps a dozen soldiers might easily be inconspicuous. Even when they were on the Mount of Olives and close to the spot where Jesus and the apostles were passing the night, they might be taken for a company of pilgrims going to their camp. But when Judas, still suspecting nothing, saluted his Master with a kiss, then we may think these soldiers rushed up at a signal from their leader, and seized their victim.

Against this theory an objection may be urged, which will now be considered. If Judas intended no wrong, his guilt was only similar to that of Peter, James, and John, who slept at their post. How then can we account for the apparently unanimous opinion of the disciples, that Judas was a malicious traitor, and on the other hand for the charity with which the negligence of these three was regarded? The answer is simple. Peter, James, and John brought forth works meet for repentance, and did what they could to atone for their negligence. But Judas, repairing in sorrow and remorse

to his home, missing the visions of the risen Master and therefore concluding that the work of Jesus was a failure, never rejoined the other disciples. Apparently disloyal, as they too would in all likelihood have been were it not for the new faith in the Resurrection, upon him was heaped their merciless judgment, notwithstanding the Master's precept, "Judge not." But must we also be uncharitable? The deed of Judas may, as has been suggested, have been due to cowardice, or it may have been an innocent mistake, but hardly at all events a deliberate crime.

THE SYLLABUS OF POPE PIUS X.*

BY HYACINTHE LOYSON.

[In the last moment, while making the present number ready for the press, we received Father Hyacinthe Loyson's communication concerning the Syllabus of the Pope. We notice that he recognizes the piety of the present head of the Roman Church, but regrets his narrowness. He expresses himself rather boldly, but such is the habit of reformers who have a message to deliver, and high ideals to which they aspire. He is not, however, discouraged as to the future, for he is confident that God still governs the development of the Church, and the very mistakes which the Vatican may make will in the long run lead to progress and reform.—ED.]

"Roma locuta est, causa finita est."

I HAVE undertaken to write some comments (more or less complete) upon the Syllabus of Pius X; but what is the use since the document is of no interest to any one, both freethinkers and Catholics having formed their opinion at the outset? I refer to those Catholics who are intelligent but not courageous, and who will always submit externally although constantly resisting inwardly, and the freethinkers who have ceased to expect good fruit from a corrupt tree, that is to say, from a Church whose authority rests upon falsehood in history and temporizing in ethics.

Roma locuta est, causa finita est: words which in the text of St. Augustine never possessed the meaning which the Ultramontanes forced upon them, but which to-day have acquired a new significance. Rome might be considered the guardian of a profound secret, but she has finally spoken, and her word has been of so little value that her friends can no more expect anything further than can her enemies. The cause is indeed finished, *causa finita est*.

Pius IX gave us the theory of Ultramontanism, but Pius X puts it into practice, and practice dooms theory. We are witnessing a great practical lesson.

I saw all this in 1869, when I resigned of my own accord from the pulpit of Notre-Dame, a position as good as that of many of our actual bishops, but in which I no longer felt free to be honest. I

* Translated from the French by Lydia Gillingham Robinson.

never lied to my conscience, but more than once I was condemned to keep silence when according to the decree of the Vatican it amounted to prevarication. "Dumb dogs, who have forgotten how to bark," says the prophet. I did not wish to be one of that number.

Without renouncing Catholicism which was too dear to my heart, I appealed from an ill-informed pope to one better enlightened, and from a council limited in its jurisdiction and without liberty in its deliberations, to a council representing not a part only of Christianity but Christianity as a whole, and speaking not in a partisan spirit, but in the spirit of truth, of justice, and of God. It is not only the Gallican Church which said, "*Concilium est supra Papam.*" History says the same thing when it shows us one council condemning Pope Honorius for a heretic, and another one that deposed three popes.

My appeal was not heeded in the least. I now renew it, however, in order to remain faithful to the traditions of the Church without much hope that it will fare any better. The hour in which I speak is even worse than when I spoke thirty-eight years ago. In order to have a Council there must be bishops, and in those days there were the Darboys, the Strossmayers, the Passavalis, and others besides, who although not holding such high positions were far from being insignificant. Now we no longer have bishops, true successors of the apostles, but only prefects robed in violet, appointed or recalled by Pope Pius X and by his Secretary of State, Merry del Val.

The true bishops passed judgment in matters of faith,—*propterea ego judico*, was the canonical formula. These fictitious bishops keep silence or else speak so low that they are not heard even in matters of discipline and opportunity. This has been evident in their recent assemblies at Paris. "The will of the Pope, the will of God," they repeat incessantly in their pastoral letters.

Since they have unlearned the lessons of the prophet of Galilee, since they have forgotten the example of St. Paul who boasts of having resisted St. Peter, "I withstood him to the face, because he was to be blamed," let them learn of the curé of Meudon: "We must not fall into popery," wrote Rabelais, "for popery is simply idolatry."

Perhaps our bishops will finally understand that they are not only ignorant of history, filled as it is with the errors of the popes, but they are the instigators of a new idolatry which an ignorant and passionate man in his false piety sets up instead of reason, of conscience, and of God.

Must we then lose courage entirely after dedicating our lives

to religious truth? Far be it from us to display such baseness! "If bishops have the hearts of women, the women must have the hearts of bishops," said the abbess of Port Royal. In place of the bishops of France who do not dare and the women of France who do not know, the laity must come to the front, laity and priests alike.

I knew the clergy of France better than they did at Rome,— I mean the chosen spirits who will finally carry the masses with them. I know how we must interpret the silence which these men will not always keep.

One of the most distinguished among them wrote me recently, "Your word, believe me, can still prevent the ruin, or repair it. God, the soul, Jesus Christ; what a cause to defend!" And he added, "Poor theologians, who attempt to confine the infinite in the four and twenty letters of the alphabet! Their formulas have destroyed the enthusiasm of souls, without bringing them obedience and peace."

As for myself, I am too old to say much to-day, but I hope that I will not die without having seen those laborers of God arise, who will rebuild the new structure in individuals and religious societies. However, in order to accomplish this, it is necessary that the old walls be torn down, and it is to this end that a pious and narrow pope is working with a truly providential energy, and assisted by the Roman congregation of the Index and Inquisition, and above all by the cosmopolitan order of the Jesuits.

"Woe to the inhabitants of the earth!" says St. John the Divine, "for the Devil is come down unto you, having great wrath, because he knoweth that he hath but a short time."

It is said that Cardinal Sarto, who did not wish to be made pope, said to Cardinal Lecot, "*Electio mea esset ruina Ecclesie.*" "My election will be the downfall of the Church." He foretold the truth.

God knows what He is doing in governing the world by the folly of men together with his own wisdom. We ask for reform in the theology of the seminaries, in the performance of worship, in pious observances, in the regulations of discipline, in the centralization of government. The wind which blows from the future with constantly increasing force will blow away all of this like dead leaves. It will waft away the errors and secular abuses, and with them that part of the institution from which they have become inseparable. We hoped to reform the Church, God will transform it.

MISCELLANEOUS.

WONDERLAND.

Have you ever tried to understand
The beautiful laws of Wonderland?
Enchanted realm of the sun-set hours,
The paradise of all the flowers,
Where your dearest wishes all come true
And happiness follows all you do,
Where you meet the ones you love the best,
Where weariness disappears in rest,
Where real and ideal are just the same,
Where everything's known by just one name?
All that you need is to understand,
Then everywhere becomes Wonderland.

DONALD FULLER.

MISS MARY DE MORGAN.

Miss Mary Augusta De Morgan, the gifted daughter of the celebrated English mathematician, died a few months ago at Cairo, Egypt. She inherited great literary ability and much of her father's readiness of thought and facility of expression. She has written some charming volumes of fairy tales,—*The Wind Fairies* as lately as 1900, but is best known by *The Necklace of the Princess Florimonde* and *On a Pincushion*, published in the later seventies. She was greatly interested in her father's work and edited some of his posthumous publications. She wrote a life of her mother, who was also an unusually gifted and strong character. She was one of William Morris's closest friends and cared for him in his last illness. For many years she was an earnest worker in the social settlements of East London. Upon this labor for the uplift of the unfortunate she expended much of her time, money, enthusiasm and strength, and finally, even when in 1905 her London work proved too great a draught upon her physical resources and she felt obliged to seek the milder atmosphere of the Mediterranean climate, she took charge of a reformatory for Arab girls in Egypt until her death.

Miss De Morgan's father, Augustus De Morgan, was a brilliant and versatile man, and in the field of the philosophy of mathematics was a generation or more in advance of his time. From his *Elements of Arithmetic* to his most abstruse contributions to Logic, his works not only bear the stamp of his own creative thought but enlist the same enjoyment on the part of his

readers. His *Budget of Paradoxes* is a rare collection of scientific oddities with running comments of the most pungent humor and interest from the witty pen of their editor. The Open Court Publishing Company has published two of De Morgan's books *On the Study and Difficulties of Mathematics*, and *Elementary Illustrations of the Differential and Integral Calculus*, and considers them among the most valuable of its Mathematical Series.

The only living representative of this truly remarkable and brilliant family is the scientist William De Morgan, who by a strange anomaly happens to be best known to the general public by two or three delightful novels, *Alice-for-Short* and *Joseph Vance*, which have attained popular favor, though they represent only hours of the author's recreation after a busy life of scientific research. He is recognized as having re-invented for the use of modern times the forgotten art of producing luster pottery.

BOOK REVIEWS AND NOTES.

RELIGION AND HISTORIC FAITHS. By *Otto Pfeleiderer, D. D.* Translated from the German by *Daniel A. Huelsch, Ph. D.* New York: Huelsch, 1907. Pp. 291. Price, \$1.50 net.

This book comprises a course of lectures on comparative religion (introduced by three on the general subject of the philosophy of religion), which was delivered before the theological department of the University of Berlin in the winter of 1905-1906. Most of Dr. Pfeleiderer's published lectures have been on philosophical or religious themes which bore particularly upon some aspect of the history of Christianity, but in this volume after treating of what religion really is and its relation to science and the conduct of life, he discusses in turn each of the great world-religions—those of Egypt, Babylonia, and the ancient Greeks, as well as the present-day faiths of China, India, Israel, Islam and Christendom. Dr. Pfeleiderer was a student under Professor Baur at Tübingen, and considers him the first to have applied the scientific method to the study of theology. Pfeleiderer himself was a visitor to the St. Louis exposition as a member of the Congress of Arts and Sciences and is well known among liberal theological circles here. He was an honored guest at the recent Congress of Liberal Religion at Boston, and is now engaged as a lecturer at Harvard University with other University engagements in the East.

COENOBIIUM. *Rivista Internazionale Di Liberi Studi.* Lugano, 1907. Price, 15 fr. per year; 3 fr. per number (bi-monthly).

Coenobium is a new periodical published by Enrico Bignami which is devoted to the special purpose of the ideal of a contemplative religious life after the fashion of monasteries. It is, however, not limited to the ideals of Roman Catholic monks, but takes a bolder view and considers the same religious sentiments of others who are not believers in the Roman Catholic Church. The subject-matter treated in this periodical, accordingly, is very varied, and devotes a good deal of space to non-Christian religions, especially Buddhism. So far four numbers have appeared in which philosophical as well as religious questions have been treated. Any one interested in the periodical should for further details address the editor, Enrico Bignami, Villa Conza, Lugano, Switzerland.

ENSEIGNEMENT ET RELIGION. Etudes philosophiques par *Georges Lyon*. Recteur de l'Académie de Lille, ancien maître de conférences à l'École Normale Supérieure. Paris: Félix Alcan, 1907. Pages, 237. Price, 3 fr. 75.

Since the dissolution of the Concordat, and the separation of Church and State, France has passed into a new phase which demands the solution of new problems. One of them, and we may say, not the least of them, is the problem of teaching religion in school, and Monsieur Georges Lyon, a prominent educator in France, being director of the Academy of Lille, has undertaken to review all the difficulties of the situation and make his propositions, which we do not hesitate to say are desirable and will most likely prove acceptable to the government. He is not an extremist, not an enemy of the Church. He preaches moderation and justice. He would have been disheartened if he had written his book a decade ago, but he feels encouraged by the progress made of late, and hopes that his aims will be realized within reasonable time.

The first part of the book is devoted to the subject of the contrast of State institutions and religious thought, and examines how and in what spirit a professor appointed by the State should teach his pupils if he has to deal with religious facts. Since the rupture of the Concordat many difficulties have been removed, and the State has now a free hand to do what it will naturally deem to be right. The conclusions of the author are practical and simple, though he is not likely to be countenanced by the pretensions of extremists on either side, and his conclusions may be summed up in three words: tolerance, liberty of thought, and respect.

In the second part of his book M. Lyon criticises those philosophers who would introduce spiritualistic notions, and would replace the old religious views by a new, and what we would call an unsectarian, religion based on a primitive theism. He concludes his volume with an appeal to the ideal of tolerance, and takes as his standard the English philosopher Locke, whose educational ideal he deems most practical, and especially suitable for the present condition of France. He hopes that the future of France will be bright. The realization of his aims, he says, is not chimerical. The progress made of late in the establishment of international good will, the realization of the Hague tribunal, all seem to guarantee the progress of a healthy natural development. The mere thought of universal peace, he thinks, if but realized by every one of us, will help to bring about a better future which will be the long hoped-for realization of the cherished dream of the idealists of former ages.

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
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THE Journal of Geography, published by Teachers College, Columbia University, New York City, is a magazine for TEACHERS of geography in Elementary, Secondary and Normal Schools. It contains articles for teachers, notes concerning recent geographical events and stimulative methods of teaching, notices of recent publications and reviews. It is the only magazine in America specially devoted to the TEACHING of Geography.

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THE CHINESE LANGUAGE AND HOW TO LEARN IT

A Manual for Beginners, by SIR WALTER HILLIER, K. C. M. G., C. B.

A NEW Chinese grammar has appeared which, as we learn from private sources, is being used officially by the English authorities for the preparation of their candidates for office in the English colonies of China. The author says in the preface: "The present work is intended to meet the wants of those who think they would like to learn Chinese but are discouraged by the sight of the formidable text-books with which the aspiring student is confronted; is especially intended for the use of army officers, of missionaries, and of young business men connected with the trade interests of China who wish to commence the study of the language in England with a view to continuing it in the country itself." *Pp. 263. Price, \$3.75 net.*

THE OPEN COURT PUBLISHING COMPANY, 1322 Wabash Ave., CHICAGO



Space and Geometry in the Light of Physiological, Psychological and Physical Inquiry.

By Dr. Ernst Mach, Emeritus Professor in the University of Vienna. From the German by Thomas J. McCormack, Principal of the LaSalle-Peru Township High School. 1906. Cloth, gilt top. Pp. 143. \$1.00 net. (5s. net.)

In these essays Professor Mach discusses the questions of the nature, origin, and development of our concepts of space from the three points of view of the physiology and psychology of the senses, history, and physics, in all which departments his profound researches have gained for him an authoritative and commanding position. While in most works on the foundations of geometry one point of view only is emphasized—be it that of logic, epistemology, psychology, history, or the formal technology

subject from all points of view combined, and the different sources from which the many divergent forms that the science of space has historically assumed, are thus shown forth with a distinctness and precision that in suggestiveness at least leave little to be desired.

Any reader who possesses a slight knowledge of mathematics may derive from these essays a very adequate idea of the abstruse yet important researches of metaphysics.

The Vocation of Man. By Johann Gottlieb Fichte. Translated by William Smith, LL. D. Reprint Edition. With biographical introduction by E. Ritchie, Ph. D. 1906. Pp. 185. Cloth, 75c net. Paper, 25c; mailed, 31c. (1s. 6d.)

Everyone familiar with the history of German Philosophy recognizes the importance of Fichte's position in its development. His idealism was the best exposition of the logical outcome of Kant's system in one of its principal aspects, while it was also the natural precursor of Hegel's philosophy. But the intrinsic value of Fichte's writings have too often been overlooked. His lofty ethical tone, the keenness of his mental vision and the purity of his style render his works a stimulus and a source of satisfaction to every intelligent reader. Of all his many books, that best adapted to excite an interest in his philosophic thought is the *Vocation of Man*, which contains many of his most fruitful ideas and is an excellent example of the spirit and method of his teaching.

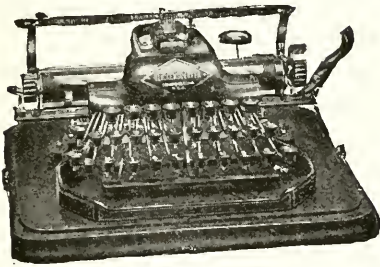
The Rise of Man. A Sketch of the Origin of the Human Race.

By Paul Carus. Illustrated. 1906. Pp. 100. Boards, cloth back, 75c net. (3s. 6d. net.)

Paul Carus, the author of *The Rise of Man*, a new book along anthropological lines, upholds the divinity of man from the standpoint of evolution. He discusses the anthropoid apes, the relics of primitive man, especially the Neanderthal man and the ape-man of DuBois, and concludes with a protest against Huxley, claiming that man has risen to a higher level not by cunning and ferocity, but on the contrary by virtue of his nobler qualities.

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Aristotle on His Predecessors.

Being the first book of his metaphysics. Translated from the text of Christ, with introduction and notes. By A. E. Taylor, M. A., Fellow of Merton College, Oxford; Frothingham Professor of Philosophy in McGill University, Montreal. Pp. 160. Cloth, 75c net. Paper, 35c postpaid.

This book will be welcome to all teachers of philosophy, for it is a translation made by a competent hand of the most important essay on the history of Greek thought down to Aristotle, written by Aristotle himself. The original served this great master with his unprecedented encyclopedic knowledge as an introduction to his Metaphysics; but it is quite apart from the rest of that work, forming an independent essay in itself, and will remain forever the main source of our information on the predecessors of Aristotle.

Considering the importance of the book, it is strange that no translation of it appears to have been made since the publication of that by Bekker in 1831.

The present translation has been made from the latest and most critical Greek text available, the second edition of W. Christ, and pains have been taken not only to reproduce it in readable English, but also to indicate the exact way in which the translator understands every word and clause of the Greek. He has further noted all the important divergencies between the readings of Christ's text and the editions of Zellar and Bonitz, the two chief modern German exponents of Aristotelianism.

Not the least advantage of the present translation is the incorporation of the translator's own work and thought. He has done his best, within the limited space he has allowed himself for explanations, to provide the student with ample means of judging for himself in the light of the most recent researches in Greek philosophical literature, the value of Aristotle's account of previous thought as a piece of historical criticism.

Babel and Bible. Three Lectures on the Significance of Assyriological Research for Religion, Embodying the most important Criticisms and the Author's Replies. By Dr. Friedrich Delitzsch, Professor of Assyriology in the University of Berlin. Translated from the German. Profusely illustrated. 1906. Pp. xv, 240. \$1.00 net.

A new edition of "Babel and Bible," comprising the first, second and third lectures by Dr. Friedrich Delitzsch, complete with discussions and the author's replies, has been published by The Open Court Publishing Company, making a stately volume of 255 pages.

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Friedrich Schiller

A Sketch of His Life and an Appreciation of His Poetry. By Dr. Paul

Carus. Profusely illustrated. 1905. Pp. 102, octavo. Boards, cloth back, illustrated cover, 75c net. (3s. 6d.)



"This adequately illustrated and tastefully bound volume by Mr. Paul Carus is an admirable memorial of the recent Schiller Centenary. In addition to a biographical sketch we have two thoughtful essays by Dr. Carus on Schiller as a philosophical poet and on Schiller's poetry. Both have well-chosen selections of considerable extent, and it was a good idea to present these illustrative excerpts in both German and English."—*The Outlook*.

Eros and Psyche

A Fairy Tale of Ancient Greece.

Retold After Apuleius. By Dr. Paul Carus. Half-tone reproductions, with ornamental borders, of the famous illustrations of Paul Thumann. Printed from pica type on Strathmore deckle-edge paper, elegantly bound, and with classic cover design by E. Biedermann. One of the quaintest stories of the world's folklore. Pp. xv, 108. Souvenir edition with 41 beautiful pen-and-ink drawings and eleven half-tone plates. Strathmore paper, gilt top. \$1.50 net. (6s. net.)





Spinoza and Religion

By

Elmer Ellsworth Powell

Professor of Philosophy in Miami
University

This book is accurately described on the title page as "a study of Spinoza's metaphysics and of his particular utterances in regard to religion, with a view to determining the significance of his thought for religion and incidentally his personal attitude toward it."

PRESS NOTICES

"Professor Powell has produced an exceedingly able and authoritative book. Few will read it without feeling that it settles for them the question of Spinoza's real attitude to God and to religion. And those who read it will obtain incidentally the benefit of a clear and consistent presentation of the whole philosophic system of one of the most difficult to understand of all the great thinkers of European history."—*The Glasgow Herald*.

"It is a particularly illuminating exposition of the whole subject that is here given by Professor Powell A book of uncommon intelligence, acumen and carefulness of investigation."—*The Chicago Evening Post*.

"It is an exceedingly attractive presentation of the life and times of Spinoza and of his attitude toward scholarship and truth."—*Journal of Education*.

"Altogether, Professor Powell makes out a good case for the main proposition, and his work is likely to affect current opinion as to the general position of Spinoza, in the course of religious thought. He will have to be counted with by every student of philosophy and religion, and should be specially studied by those who claim that Spinoza is specifically a Jewish philosopher."—*The American Hebrew*.

"Throughout the author demonstrates his familiarity with the field and his liveliness of interest. The style, furthermore, is excellent."—*The Nation*.

Pp. xi + 344. Price, cloth \$1.50 net (7s. 6d.)

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Essay on the Creative Imagination.

By Prof. Th. Ribot. Translated from the French by A. H. N. Baron, Fellow in Clark University. 1906. Cloth, gilt top. Pp. 357. \$1.75 net. (7s. 6d. net.)

Imagination is not the possession only of the inspired few, but is a function of the mind common to all men in some degree; and mankind has displayed as much imagination in practical life as in its more emotional phases—in mechanical, military, industrial, and commercial inventions, in religious, and political institutions as well as in the sculpture, painting, poetry and song. This is the central thought in the new book of Th. Ribot, the well-known psychologist, modestly entitled *An Essay on the Creative Imagination*.

It is a classical exposition of a branch of psychology which has often been discussed, but perhaps never before in a thoroughly scientific manner. Although the purely reproductive imagination has been studied with considerable enthusiasm from time to time, the creative or constructive variety has been generally neglected and is popularly supposed to be confined within the limits of esthetic creation.



Our Children. Hints from Practical Experience for Parents and Teachers. By Paul Carus. Pp. 207. \$1.00 net. (4s. 6d. net.)

In the little book *Our Children*, Paul Carus offers a unique contribution to pedagogical literature. Without any theoretical pretensions it is a strong defense for the rights of the child, dealing with the responsibilities of parenthood, and with the first inculcation of fundamental ethics in the child mind and the true principles of correction and guidance. Each detail is forcefully illustrated by informal incidents from the author's experience with his own children, and his suggestions will prove of the greatest possible value to young mothers and kindergartners. Hints as to the first acquaintance with all branches of knowledge are touched upon—mathematics, natural sciences, foreign languages, etc.—and practical wisdom in regard to the treatment of money, hygiene, and similar problems.

Yin Chih Wen, The Tract of the Quiet Way. With Extracts from the Chinese commentary. Translated by Teitaro Suzuki and Dr. Paul Carus. 1906. Pp. 48. 25c net.

This is a collection of moral injunctions which, among the Chinese is second perhaps only to the Kan-Ying P'ien in popularity, and yet so far as is known to the publishers this is the first translation that has been made into any Occidental language. It is now issued as a companion to the T'ai-Shang Kan-Ying P'ien, although it does not contain either a facsimile of the text or its verbatim translation. The original consists of the short tract itself which is here presented, of glosses added by commentators, which form a larger part of the book, and finally a number of stories similar to those appended to the Kan-Ying P'ien, which last, however, it has not seemed worth while to include in this version. The translator's notes are of value in justifying certain readings and explaining allusions, and the book is provided with an index. The frontispiece, an artistic outline drawing by Shen Chin-Ching, represents Wen Ch'ang, one of the highest divinities of China, revealing himself to the author of the tract.

The motive of the tract is that of practical morality. The maxims give definite instructions in regard to details of man's relation to society, besides more general commands of universal ethical significance, such as "Live in concord," "Forgive malice," and "Do not assert with your mouth what your heart denies."

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deal of interesting material. The union of discussions of religious, philosophical and scientific questions appears to me to be felicitous."—AUGUST WEISMANN, Professor in the University of Freiburg, Germany.

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Zarathushtra, Philo, the Achaemenids, and Israel

*Being a Treatise upon the Antiquity and Influence of the Avesta, for
the most part delivered as University Lectures.*

By DR. LAWRENCE H. MILLS, Professor of Zend Philology in the University of Oxford, Translator of the Thirty-first Volume of the Sacred Books of the East, Author of the Five Zarathushtrian Gathas, etc. Part I.—ZARATHUSHTRA AND THE GREEKS. Part II.—ZARATHUSHTRA, THE ACHAEMENIDS AND ISRAEL. Composed at the request of the Trustees of the Sir J. Jejeebhoy Translation Fund of Bombay. 8vo. Pp. xiii, 208; xiv, 252, two parts in one volume, cloth, gilt top, \$4.00 net.

Shortly before the death of Professor James Darmesteter, of Paris, the great authority on the "Zend-Avesta," he surprised the general public by changing his views concerning the antiquity of the Zoroastrian literature, maintaining that the "Gathas" were largely influenced by the writings of Philo, and were written about the beginning of the Christian era. This change of view on his part led the Parsees of India to engage Dr. Mills to write a book upon the great antiquity of the "Avesta." After several years of continuous devotion to the subject, the present volume is put forth as the result, and it amply meets all expectations. The antiquity of the Zoroastrian literature is successfully maintained, and in such a manner that ordinary readers can appreciate the argument.

"The Avesta in no sense depends upon the Jewish Greeks. On the contrary, it was Philo who was in debt to it. He drank in his Iranian lore from the pages of his exilic Bible, or from the Bible-books which were then as yet detached, and which not only recorded Iranian edicts by Persian Kings, but were themselves half made up of Jewish-Persian history. Surely it is singular that so many of us who 'search the scriptures' should be unwilling to see the first facts which stare at us from its lines. The religion of those Persians, which saved our own from an absorption (in the Babylonian), is portrayed in full and brilliant colors in the Books of the Avesta, because the Avesta is only the expansion of the Religion of the sculptured edicts as modified. The very by-words, as we shall later see, are strikingly the same, and these inscriptions are those of the very men who wrote the Bible passages. This religion of the Restorers was beyond all question historically the first consistent form in which our own Eschatology appeared" (pt. i. pp. 206-207).

The conclusions come with great force in support of the genuineness and authenticity of the biblical references to Cyrus in the Old Testament. Students of the literature of the Captivity will find the volume invaluable. The facts now brought to light are such as the literary critics cannot afford to neglect.

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