

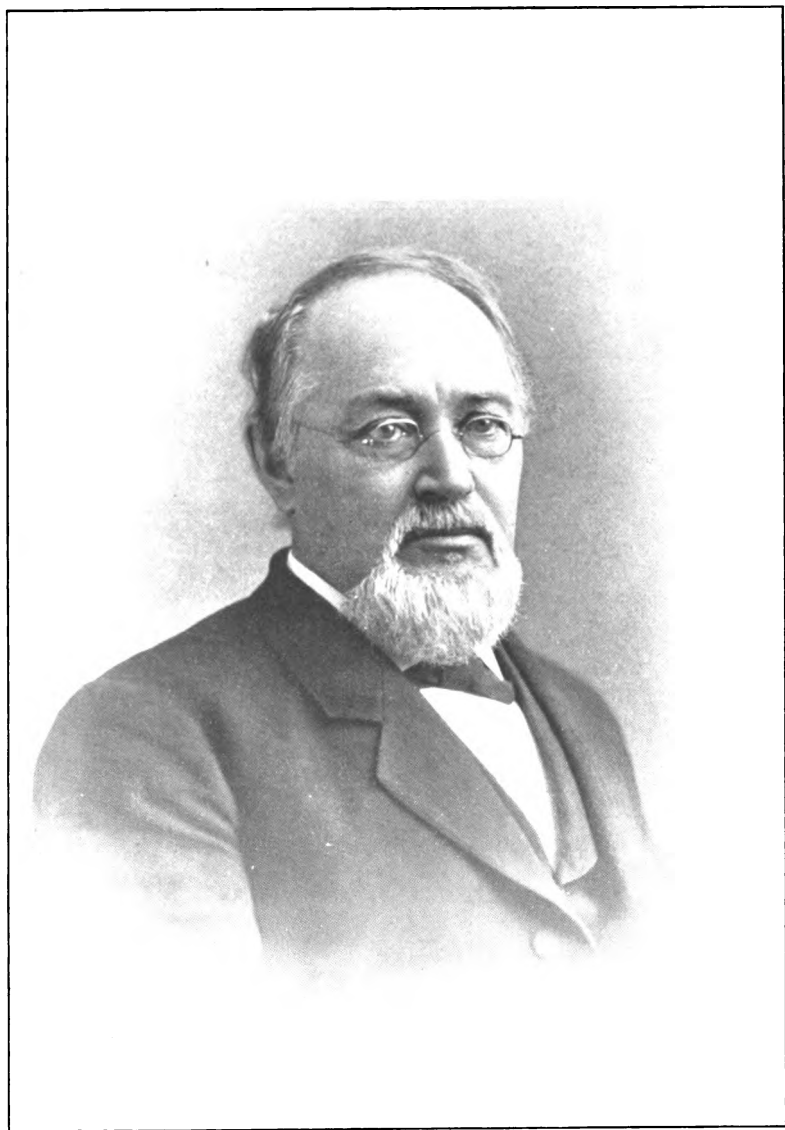
From Lafayette College
1897

Addresses in Honor of

Prof. Thos. Conrad Porter, D.D., LL.D.

LAFAYETTE COLLEGE,

OCTOBER 20, 1897.



THOS. CONRAD PORTER, D.D., LL.D.

Professor of Botany, Zoology and General Geology in Lafayette College.

ADDRESSES

DELIVERED AT

A CELEBRATION IN HONOR OF

Prof. Thos. Conrad Porter, D.D., LL.D.,

—AT—

LAFAYETTE COLLEGE,

October 20, 1897.

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PREFATORY NOTE.

Thomas Conrad Porter, D.D., LL.D., was born at Alexandria, Pennsylvania, January 22, 1822. He graduated at Lafayette College in 1840, in a most notable class, and after pursuing a course in Theology at Princeton Seminary, returned in 1843 to receive the Master's degree and deliver the Master's oration. After some years spent in the pastorate he became, in 1848, professor of the natural sciences at Marshall College, and when that college united with Franklin College he filled the same chair in the united colleges until 1866. In that year he was called by the joint invitation of Trustees and Faculty to Lafayette, to the Jesse Chamberlin chair of Botany. Owing to the necessities of the college he also served it as the head of the departments of Zoology and General Geology. After a long and useful career, diversified by scholarly activity in many fields, he retired from the active duties of his professorship January 1st, 1897. He continues to occupy a place in the college life as Curator of the Botanical Collections and Emeritus Professor.

The exercises of Founder's Day, 1897, were planned as a recognition of his long, devoted and distinguished services to the college. On that occasion the following was the order of exercises :

Invocation. Rev. John H. Stahr, D.D., President of Franklin and Marshall College.

Introductory Remarks. President Ethelbert D. Warfield, LL.D.

Address. "The Progress of Systematic Botany in North America." Prof. N. L. Britton, Ph.D.

Address. "Thirty Years of Geological Progress in North America." Prof. Wm. B. Scott, Ph.D.

Address. "Dr. Porter as a Pioneer in Finnish Literature." Hon. John M. Crawford, M.D.

Benediction. Rev. Samuel A. Martin, D.D., President of Wilson College.

In accordance with a resolution of the Board of Trustees the addresses are now published.

At a meeting of the Executive Committee of the Alumni Association on the morning of the celebration, the following resolution was adopted :

Resolved, that the Executive Committee extend to the Rev. Thos. C. Porter, D.D., LL.D., their congratulations on the completion of his long and eminent services as professor of botany and zoology ; and would record on behalf of the alumni of the college their loving esteem and high regard for his sterling character and eminent achievements ; and would invoke a special blessing on him from his Divine Master, whom he always honored, and that he may continue to enjoy the regard and esteem of his colaborers in his chosen field of science.

[Signed] JAMES W. GILLAND,
President.

[Signed] SELDEN J. COFFIN,
Secretary.

INTRODUCTORY REMARKS.

BY PRESIDENT ETHELBERT D. WARFIELD, LL.D.

In setting apart a day for annual observance as Founder's Day, this college has not intended to honor any single man, however distinguished his services to it, but to commemorate all those who have contributed to its foundation, enlargement, and growth. Our celebration to-day is, therefore, in exact accord with the spirit of the day. The exercises have been planned as a recognition of the services rendered to the college by Prof. Thos. Conrad Porter, D.D., LL.D., during his thirty years of active work as a member of the Faculty. The recognition is one that it is very grateful to accord. On behalf of the Trustees and the Faculty, I speak what I know is a unanimous sentiment when I say that the college in all its departments recognizes with sincere gratitude the labors of him whom we honor to-day. It is pleasant to point out the close ties that bind him to the history of the college. When he came here he was but a boy of fourteen years and the college was in the first stage of its development. His early relationships with the first president and his family were close and lasting. He carried from the college the zeal which so strongly marked that epoch of American intellectual progress for

teaching and preaching. The scholarly preacher soon became also the Christian scientist. His purpose in pulpit and classroom alike was the exposition of truth. The employment of different methods of investigation never blinded his eyes to the essential unity and harmony between the facts of nature and revelation. His success in our sister institution, Franklin and Marshall College, and his reputation as a preacher and as a man of literary taste and skill, naturally led to his appointment as professor of the natural sciences as soon as the great expansion of the college under Dr. Wm. C. Cattell's administration began. The task which he successfully performed for years, of carrying a great department of human knowledge in such a way as to meet successfully the demands of the classroom and the public was an immense one. We lesser men of this generation say such feats are impossible. Yet human knowledge did not die out in the days of Guyot, Agassiz and Porter, but advanced with no uncertain step. While he labored in the classroom, he shone in the pulpit; while he used the results of other men's investigations in some fields, he contributed largely to the sum of human knowledge in others, especially in the department of systematic botany. We rejoice that although he has laid down the trying routine of the classroom he remains here in charge of his botanical collection, a constant witness to the sturdy manhood, the reverent scholarship

and the wide culture which have marked American education in the fast-closing Nineteenth Century.

In accordance with Dr. Porter's own wish the exercises to-day have been made to bear rather upon the departments in which he has labored, than his labors in these departments. After all, the highest honor we can confer upon any man is to show that the work in which he has been a sharer has been crowned with success. The representatives of our sister universities will therefore speak of the general progress of science in the past thirty years. Our distinguished alumnus, pleading the right of a pupil, has chosen a somewhat more personal theme for his address.

THE PROGRESS OF SYSTEMATIC BOTANY IN NORTH AMERICA.

BY N. L. BRITTON, PH.D., DIRECTOR-IN-CHIEF,
NEW YORK BOTANICAL GARDEN.

The description and classification of the plants of North America on a scientific basis has now been prosecuted for about a century and a half. It is time that herbalists and botanists prior to Linnaeus knew a few of our species, gathered for the most part by travelers and naturalists, such as Bannister, Clayton, and Catesby, but their work has mainly historic value, and it is first in the "Species Plantarum" of Linnaeus, published in 1753, that any considerable number of descriptions of American plants were brought together in a systematic manner. The descriptions given by Linnaeus are, to be sure, in most cases meager and in many instances inadequate to satisfactory determination, but his work furnished a foundation on which others could build, and on which others have since built.

During the eighteenth century, while no one attempted a complete enumeration or description of the flora of our continent, several works describing the plants of local areas appeared, among which may be mentioned Gover-

nor Colden's "*Plantae Coldenhamiae in Provincia Noveboracensi Americes Sponte Crescentes*," published at Upsala in 1749-53, which enumerated the plants observed by him in Orange Co., N. Y.; Rev. Moses Cutler's "*Account of Some of the Vegetable Productions Growing in New England, Botanically Arranged*," Boston, 1785; Humphrey Marshall's "*Arbustrum Americanum*," 1785, a very intelligent account of the trees and shrubs of the Middle States; Thomas Walter's, "*Flora Caroliniana*," 1788; and Rev. Henry Muhlenberg's "*Index Florae Lancastriensis*," Philadelphia, 1793, with supplement, 1796, a list of the plants of Lancaster County, Penn.

Since 1800 the study of local floras has been prosecuted on a continually expanding scale, so that we now have at least some published information about the plants of nearly every portion of our area, although it may be confidently asserted that the flora of no section of it is as yet completely and critically known, and it is probable that another century and a half must elapse before an approximation to a complete record and satisfactory grouping and description of our plants can be expected, even with the steadily increasing number of observers and the improved methods of observation. It is a pleasure to bear evidence that, owing chiefly to the labors and long-continued investigations of the student whom we meet to-day to honor and applaud, the flora of

the State of Pennsylvania is as thoroughly known as that of any equal area in the country; and it is a source of the keenest satisfaction to know that the invaluable collections brought together by him in the course of this research are preserved as a permanent part of the educational equipment of the institution which claims him as one of her most distinguished sons, and with which he has been so long and so honorably connected. Gentlemen of the trustees, these collections should be most carefully conserved. They are among the most valuable scientific material in America.

Among the more noteworthy and widely known of the local floras are the works of Amos Eaton, John Torrey, Alphonso Wood, and Asa Gray, which describe, in methods especially adapted to schools, the flowering plants and ferns of northeastern North America; that of Sir William Hooker on the "Flora of the British Possessions"; Dr. A. W. Chapman's "Flora of the Southern United States"; of William H. Brewer, Sereno Watson, and Asa Gray on the "Botany of California"; of Edward Lee Greene "On the Plants of the Pacific States"; of Thomas C. Porter and John M. Coulter "On the Rocky Mountain Flora"; and of John M. Coulter "On the Flora of Western Texas". The catalogues and lists of state, county, and other local floras, many of which are descriptive, and others mere enumerations, now number over one thousand titles.

Another special line of research in which much has been accomplished is the monographing of orders, families, and genera. Among the more elaborate of these works, on which the arrangement of descriptive floras is largely based, are the monographs of the "Myxomycetes (Slime Moulds)" by M. C. Cooke; of the "Marine Algae" by Thomas Harvey and by W. G. Farlow; of the "Fresh Water Algae" by the Rev. Francis Wolle; of the "Pyrenomycetes (Parasitic Fungi)" by Job B. Ellis; of the "Hymenomycetes (Mushrooms and Toadstools)" by Chas. H. Peck; of the "Lichens" by Edward Tuckerman and by Albert Schneider; of the "Mosses" by Leo Lesquereux and Thomas P. James; of the "Hepaticae (Liverworts)" by Lucien M. Underwood; of the "Pteridophyta (Ferns and their Allies)" by Lucien M. Underwood; of the "Ferns, Proper" by Daniel C. Eaton; of the "Naiadaceae (Pondweeds) and Other Fresh Water Aquatics" by Thomas Morong; of the "Gramineae (Grasses)" by Geo. Vasey and F. Lamson-Scribner; while critical descriptions of smaller groups are quite too numerous to be recorded in this connection. The trees of North America have been described by Andre Michaux, Thomas Nuttall, and C. S. Sargent.

Passing from the consideration of local and special work on our systematic botany to that of general, we find that it has been six times seriously essayed to describe

and classify the plants of North America as a whole. The French gardener and collector, Michaux, who traveled very extensively in the eastern part of the continent in the latter part of the last century, gathered the material on which is based his "*Flora Boreali-Americana*," written by Claude Richard and published at Paris in 1803. Frederick Pursh, a German botanist, wandered widely in the east in the early part of this century and made extensive collections, on which, together with material obtained from other sources, was based his "*Flora Americana Septentrionalis*," published in 1814. The learned and distinguished American naturalist, Nuttall, published as his first work on our flora his "*Genera of North American Plants*," at Philadelphia in 1818. These three pioneer floras were necessarily fragmentary and imperfect, and collectively they describe a mere fraction of the flora as known to us to-day. The first volume of Torrey and Gray's "*Flora of North America*," the earliest attempt at a complete description of our plants, appeared from 1838 to 1840, and the second from 1841 to 1843, when its further publication was abandoned. The first part of Dr. Asa Gray's "*Synoptical Flora of North America*," which took up the continuation and revision of the work just cited, was published in 1878; the second, in 1884. Its continuation was interrupted by his death in 1888, and the third part, under the editorship of Dr. Sereeno Watson and Dr. B. L. Robinson appeared in 1895;

the fourth part, under Dr. Robinson's editorship, has recently appeared. The work is to be continued by Dr. Robinson. "The Systematic Botany of North America," now being prepared through the cooperation of nearly all the botanists of the country, was planned in 1894, and it is hoped that its publication may soon be commenced.

During the last half of the century Prof. Porter has contributed information and material of great value to practically all the monographers of groups or of floras during that period; his collecting and critical observations began shortly after his graduation from Lafayette College in 1840, and have continued uninterruptedly for nearly fifty years. Always ready and anxious to aid, he has supplied to other authors far more information than he has personally published, so that the list of his printed papers is but an imperfect record of his contributions to botanical science.

The classification of plants proposed by Linnaeus was based largely on the number of stamens and pistils of the flower, or the absence of one or the other of these organs. It did not indicate the true relationships of plants, and has therefore been termed an artificial system. Toward the end of his life Linnaeus realized that an improvement could be made upon it, in which natural affinities could be indicated, but he died without formulating anything complete. Jussieu, in his "Genera Plantarum" of

1789, elaborated a grouping of families and genera in which natural relationships were made prominent. The essential difference between an artificial and a natural system lies in the consideration by the latter of all the structural features of an organism or group of organisms, their life histories, and their derivation from preexistent groups, rather than in the restriction by the former to a study of one or two sets of organs. The Jussiean system was further elaborated and modified by subsequent authors, notably by A. P. DeCandolle, and the results reached by that famous botanist served as a basis for most of the taxonomic botanical work of the world until about twenty-five years ago.

Two other kinds of considerations and observations then came prominently to the front, considerations scarcely realized in their import and significance by the earlier scientists, although the germs of the ideas had long before been sown. These are : 1. The study of the life history of the plant and its relation to that of others. 2. The recognition of the continuity of life from remote geological times to the present, and the gradual modification of species through all this period.

The first of these lines of research has demonstrated that the early stages of a plant's growth closely parallel those of its relatives, either past or present, and thus furnish most important information relative to its affinities and to its development from preexistent forms ;

thus, as a familiar example, the first leaves produced on seedlings, or on young shoots, are often identical in form with the mature leaves of extinct types, or very closely resemble them, and while the fully developed plant may bear but little resemblance to its congeners, the first stages are found to be very similar.

The consideration of the derivation of existing plants from differing ancestors shows that there has been in general a progression from simpler to more complex, and more highly specialized forms, though many of the simpler ones still exist, the process having been mainly the addition and augmentation of types rather than of complete substitution.

Through the new light thrown on the organic world by these sources of information, a complete revolution and reformation in our systems of classification has been reached, and botanists are agreed that the true manner of presenting the plant world to the student, or of pursuing its investigation, is to parallel as nearly as a consecutive arrangement will permit the development sequence from the simple to the complex. Thus we find that all modern treatises on botany, be they text-books, manuals, or floras, are arranged upon this theory, and they give an altogether different presentation of the subject than that found in the works of two decades ago; that this presentation is more philosophical and of immensely greater pedagogic value there can be no reason

of doubt ; the perfection of the details of the grouping of plants under this arrangement will require prolonged study, and as new information is obtained through continued investigation, the system now tentatively followed will doubtless undergo some modification.

The earlier work along these lines of research was almost wholly effected in Europe ; recently, however, it has been vigorously taken up in America. The studies of Douglas H. Campbell on the mosses and ferns, of W. G. Farlow and his students on the algae and fungi, of Albert Schneider on the lichens, and John M. Coulter and his students on the flowering plants, and of Chas. E. Bessey on general phylogeny, claim special mention. This readjustment of the arrangement of groups and the alterations of names required by the modern adoption of fixed principles of nomenclature, have wrought great changes during Prof. Porter's time, and they have proved onerous to many botanists who were trained under former theories, but throughout the reformation he has shown a readiness to accept all which, in his judgment, has made for an advance or an improvement upon the earlier methods.

Nearly all the earlier work on the North American flora was accomplished either on herbarium material or on specimens of our plants cultivated under artificial conditions in European gardens, and the understanding

of a species from a few individuals was thus necessarily imperfect ; it required the close observation of many individual plants in the field, growing under natural conditions, to establish securely the claim of the plant to recognition as different from its relatives, or as a mere form. This kind of observation has now been pursued to the great advantage of the science by a considerable number of American students, among whom Prof. Porter stands forth as the most prominent exponent. With indefatigable enthusiasm and zeal he has traveled over a large portion of the continent, pursuing his critical observations often under great personal deprivation. He has visited nearly every section of his native State, and his work on the flora of Pennsylvania, as illustrated by his writing and by his collections, must always remain the basis for further investigation of the plants of this region.

The services of our distinguished associate to the advancement of knowledge have been manifold and noteworthy, and their results are of enduring value, but it is still more gratifying to know that they are by no means completed. Through his release from the detailed work of teaching elementary science, and his continuance in charge of the vast collections which he has himself brought together, opportunity is afforded, and will doubtless be used, for much additional work of the highest importance, as representing his mature judgment. Dear

friend, on the part of American botanists, we wish you long-continued health, pleasure, and satisfaction in the further prosecution of your beloved science.

THIRTY YEARS OF GEOLOGICAL PROGRESS IN NORTH AMERICA.

BY WM. BERRYMAN SCOTT, PH.D., PROFESSOR OF
GEOLOGY IN PRINCETON UNIVERSITY.

Most human devices for progress and improvement bring with them a certain amount of loss, and the conservatives, who wish to prevent change, can usually find some good reasons for the support of their position. The specialization and minute subdivision of work which are so very characteristic of modern science, have proceeded inevitably from the vast accumulations of facts in every department, which are far beyond the power of any single mind to grasp. If the worker would be an investigator and enlarge the boundaries of knowledge, he is compelled to be a specialist, whether he will or no. Similarly, increased resources have enabled our colleges to divide among many chairs the work which formerly was given to one, and in the older institutions, at least, we no longer see the whole range of the natural sciences confided to the hands of a single professor.

Necessary and, in many respects, advantageous as this division of labor is, it is by no means an unmixed blessing. The modern professor is only too often nar-

rowed by his specialty and cannot give his students the broad inspiring outlook over the realm of nature, such as his sadly overburdened predecessor once gave, and with such excellent educational results. We can no longer train the "all-mind" naturalists of a generation or two back, and in reading the books of the older school we become conscious of a lost wholeness and fulness of vision, of a vanished charm that has gone out of the scientific world. The student of to-day is apt to believe that the value of a treatise is in direct proportion to the lateness of its appearance, and to imagine that the older literature may be neglected. From a certain point of view, the newer works are much the more valuable, for science does advance, but it is a great mistake to suppose that the great masterpieces of the earlier school can be ignored without loss.

Dr. Porter is primarily a botanist and it is in botany that his most valuable original investigations have been made, but the duties of his chair required that he should keep himself informed as to what the geologists were doing. The thirty years of his incumbency have witnessed marvelous changes, almost a revolution indeed, in American geology, which has so advanced that it almost deserves the name of the "New Geology" which some of its more zealous and successful promoters have given to it. I dislike the term as savoring of pretentiousness, but it sometimes seems justified, so radically have many

points of view and many theoretical conceptions been altered. In a talk of twenty minutes it is not possible to do more than give the boldest outline sketch of these great results; of the noble army of investigators to whose labors the results are due, only a very few can be named. To make a selection of names for special honors would be a thoroughly invidious and thankless task.

Thirty years ago Hayden was just beginning, in very modest fashion, the operations of the U. S. Geological Survey, to which were added soon after the organizations of Wheeler, King, and Powell. From these beginnings has grown up the great Survey, which is doing such a vast work and doing it in a manner so creditable to the country. Our knowledge of the geological structure and history of the North American continent has thus been wonderfully expanded, revolutionizing many of the conceptions which thirty years ago held sway. The official surveys of the National Government, of the various states, of Canada, and of Mexico, supplemented by the labors of a host of private investigators, are rapidly reducing the *terra incognita* and converting North America and its outlying islands into one of the most completely known and understood regions of the world. This great work has not confined its effects to the country where it was accomplished; on the contrary, the new ideas emanating from it have invaded the Old World and have registered many brilliant triumphs there.

Great as have been the advances made in this direction, much still remains to be done. It is not at all to the credit of the enterprise and intelligence of our people that only a very few of the states, such as Massachusetts, Connecticut, and New Jersey, are even yet adequately mapped. Good topographical maps are an indispensable prerequisite to the more refined and accurate sorts of geological work. Some of the State surveys are in a condition far from satisfactory and the baleful influence of politics and the spoils system have invaded them with disastrous results. The melancholy example recently given by Missouri is the worst of all and should serve as a warning of what logically follows from the interference of partisan politics in the affairs of science. The widespread desire for administrative reform and the determination that the public business shall be carried on by competent men in a business-like way, encourage us to hope for a speedy improvement in the State surveys.

Another development of geology which has attained great proportions within the last thirty years is that of petrography, or the microscopic study of rocks. For this, America is largely indebted to Europe, but the science once introduced here, has had a vigorous and rapid growth and has been enriched by many contributions of great value. This new science has given the geologist an implement of unrivalled power for working out the structure, history, and mode of origin of the

various rocks. New as it is, it has added immensely to our knowledge and no branch of the subject has opened up more fruitful fields, teeming with a harvest ripe for the sickle.

A third modern development of geology, and one that is peculiarly American, is the department known as physiography, which is rapidly rising to the dignity of a distinct science. The older geology dealt almost exclusively with the formation of rocks and thus became largely a history of water bodies, sea and lake-bottoms, while the development of land surfaces and topographical forms was neglected. In this new department of the science the geologist finds the means of supplying the lack. It concerns itself with the problems of land sculpture, with the origin and highly complex histories of mountain chains, with the formation of hill and valley, plain and table-land. It deals with questions of drainage and its changes, with the evolution of lake and river systems, in their varying phases of youth, maturity, and old age. From the careful study of these problems combined with the results of structural geology, it has been found possible to reconstruct the history of the changes of the land, as the older methods had worked out the changes of the sea. By a combination of both the older and the newer methods geological history may be written with a wealth and fulness of detail, such as was not dreamed of thirty years ago. This great advance may

be said, perhaps, to have begun with Prof. Lesley's "Topography of Coal," and it received a great impetus from the exploration of the West, where the topography and structure of the region are not obscured by a thick covering of soil and a dense mantle of vegetation. It is due to the peculiarly favorable conditions formed in the arid parts of the West that the wonderful growth of this department of geology is so largely the work of Americans, who deserve the highest praise for the admirable use which they have made of their great opportunities. How very largely this new science is American, may be seen from the latest French work on the subject, which is to a great extent a compilation of American publications. It would be unjust, however, to overlook the great services of German and Swiss investigators in this field.

The excellent opportunities for the study of structural and physiographical geology which are offered by the Far West have naturally led to the careful consideration of dynamical problems, with the result that much new light has been shed upon a subject which Hutton raised to importance more than a century ago. The ideas which we inherited from our English scientific ancestors were found to be inadequate and required supplementing by many new principles, or by new applications of old ones. To enumerate the novelties produced by thirty years of assiduous labors in this field, would require far

more time than is at our disposal. Suffice it to mention, as perhaps the most characteristic of these, the new views of the extent and importance of the atmospheric agents of destruction, of the work of rivers, both destructive and reconstructive, and of the mechanics of mountain building and of the manifold results of lateral compression within the earth's crust. These ideas have found a very hospitable reception in Europe.

Quite as remarkable as any of the advances mentioned has been the progress of palæontology in this country, and most strikingly so among the extinct vertebrates, fishes, reptiles, birds, and mammals. So far as North America is concerned, vertebrate palæontology was thirty years ago almost a monopoly in the hands of its great pioneer, Dr. Joseph Leidy. Now the exploration of the West has opened up such a boundless field and has brought to light such innumerable and so admirably preserved fossils, that the American collections have become the envy and admiration of Europe. Here again, great opportunities have educated men to make good use of them, and the admirable labors of a band of workers, whose names are far less well known than they should be, must not be passed over without some mention. I refer to the collectors of fossil vertebrates. This arduous and most difficult work calls for the highest qualities of skill, patience, and endurance of hardships, and the modern collector fully meets the demands upon

him. He has developed a new art and has learned how to save the most fragile and delicate objects. Any one who will compare the collections gathered twenty years ago with those made within the last few years, cannot fail to be impressed by the great debt of gratitude which the palæontologist owes to the collector and the museum preparator.

The work has by no means been confined to the mere gathering and preparation of this vast wealth of material, for its scientific treatment, as registered in the voluminous works of many investigators, is well worthy of the golden opportunity. Nor has geology been the only science to benefit by these new treasures, for they have incalculably enriched all branches of biology and have thrown new and welcome light into the dark corners of that science. The brilliant works and the far-reaching influence of the lamented Professor Cope would of themselves cover this later age of American geology with imperishable glory, had it no other title to the respect of the scientific world.

In the other departments of palæontology, those dealing with the various groups of invertebrate animals and with plants, the advances made in the last thirty years have been equally solid and enduring, but here the opportunity has been less unique and the results less striking.

It may perhaps seem that the foregoing remarks have been unduly tinged with a patriotic pride in the

achievements of American geologists, and it will be well, therefore, to quote what Sir Archibald Geikie, Director of the Geological Survey of Great Britain, has said regarding the impressions made upon him by his visit to this country last spring. "I could not but be impressed by the extraordinary vitality which geology has now attained in the United States. Every department of the science has its enthusiastic votaries. Surveys, professorships, museums, societies, journals in almost every State are the outward embodiment of the geological zeal that appears to animate the whole community. This remarkably rapid development of the science has not arisen from any influence derived from without, but springs, as it seems to me, from the marvelous geological riches of the American continent itself. In minerals and rocks, in stratigraphical fulness, in palæontological profusion, in physiographical illustrations, the United States have not only no need to borrow from Europe, but in many important respects can produce examples and materials such as cannot be equaled on this side of the Atlantic. Had the study of the earth begun in the New World instead of the Old, geology would unquestionably have made a more rapid advance than it has done. The future progress of the science may be expected to be largely directed and quickened by discoveries made in America and by deductions from the clear evidence presented upon that continent."

To this eloquent and most gratifying tribute it would be presumption to add ; it will remove any lingering suspicion that the foregoing hasty and inadequate sketch has claimed too much for our compatriots. In wishing Dr. Porter many years of health and happiness, we trust that he may continue to follow with undiminished interest the further progress of American geology, whose future is as promising as its past is brilliant.

DR. PORTER ON FINNISH LITERATURE.

BY HON. JOHN M. CRAWFORD, M.D.

It affords me great pleasure indeed to be present on this occasion, to visit my Alma Mater, after an absence of twenty-six years. However, as I look back to the days of '71, it seems but yesterday. But memory grows not old. I recall to-day the old scenes, and roam again with Prof. Porter over the self-same hills and dales, and along the Delaware and Lehigh banks—botanizing,—gathering the *Filix mas* and the *Melilotus alba*. I remember, too, how we read with him the odes of Horace down in Jenks Hall and still ring in my ears his melodious tones as they, twenty-six years ago, rolled out his characteristic ideas on the scansion of the second ode.

I recall also the many stories and jokes that Prof. Porter worked off on us unsophisticated boys, in his own peculiar way ; and I have a dim recollection too of how we cracked a joke on him occasionally, by way of getting even. Who that has ever read Latin with Prof. Porter does not remember his story of the tobacconist of a certain college town, who on becoming rich, tried to palm himself off on the community as a man of great learning withal : so that on one occasion he instituted a

grand parade in his own honor, with banners and streamers decorated with certain classic quotations, intended to show the tobacconist's familiarity with Latin and Greek. For example, on his own chariot, which of course headed the procession, there appeared, upon either side, his coat of arms, on which was painted the family motto, in flaming letters of gold: "*Quid rides?*" (Why do you laugh?). But the college wag was there, and, as usual, was equal to the occasion, and climbing some convenient post he shouted at the top of his voice: "*The quid rides!*" Well do I remember how the Professor chuckled over his classic pun until his nose-glasses fell on the floor in fragments; and well do I recall how the boys got back, for they took his joke as solemnly as though listening to one of his chapel-prayers.

I recall one day in particular—to me perhaps the most eventful in my college-course—when the class had gathered for a quiz on the different forms of standard meter, how Dr. Porter waxed eloquent, as he was wont to do betimes, on the trochaic verse with part-line repetitions. Forgetting the important fact that the class of '71 had gathered on that occasion to tell how much they knew of the subject on hand, the Professor answered his own questions, and occupied the entire bell in giving a very entertaining and instructive lecture upon the peculiar meter and poetic construction of the Epic of Finland. I see and hear him still, as at the close of the hour, lean-

ing far out over his desk, and with his eyes rolling out from under his glasses, and glancing in all directions at once, he whispered, as though afraid some one would hear: "Had it not been for the Kalevala, Hiawatha would never have been written."

But, to the Finns and their literature, and Dr. Porter as their earliest champion in America. In the north-western part of the Russian Empire live some two and a half millions of people—the remnants of an intelligent race driven from their Asiatic homes by advancing tribes. Archæologists and comparative philologists tell us that, ages ago, this very people, in the height of their power and glory, influenced not only the language but also the manners, customs and religious notions of the Indo-European races, who afterwards became their conquerors. Gradually, but surely, pushed to the north and west, they at last found shelter in their present home—a land of marshes and lakes, rivers, seas, inlets and isles, and they style themselves *Suomalainen*, the fencible dwellers.

Until about the middle of the twelfth century, when St. Eric, King of Sweden, made a crusade against them and forced christianity into their midst, the inhabitants of Finland were pagan, and were governed by their own chiefs. The belief in magic always had a firm hold upon their minds; and to this day, in many districts of the interior, incantations and charms are used, in spite of

their professed belief in christianity, for they are all Lutherans, and regardless of the penalties of the law. In fact, the *Suomalaisen Kirjallisuuden Seura*, probably the most active literary society in all Europe, has recently published a collection of charm-songs, making a large octavo volume of 375 pages in double columns. These songs are beautifully poetic, and are the outgrowth of the national belief that they are efficacious against all human ills. For every drug in our *Materia Medica* the ancient Finn had a dozen charm-songs, called *loitso-runaja*, ranging all the way from ten to one hundred trochaic lines each. When one fell ill his favorite magician was sent for, who, on arriving, felt the pulse, looked at the tongue and examined the eye, then sat down by the bedside of his patient, chanted in metrical monotone, and always in the minor key, the appropriate charm-song, and then waited for results. If the patient recovered, the charm-song was well selected. If he died, it was by the will of Ukko—a kind of philosophy, not altogether in disrepute with the medical fraternity of the present day.

Until about fifty years ago few of these people could read and write, but recent investigations have brought us evidence that, long before the Christian era, they were not unacquainted with letters. Although this once great people, while fleeing from their conquering foes, or while smarting under the yoke of oppression,

lost their written literature, they never permitted it to fall from their memories, preserving sacredly by oral transmission alone, and guarding zealously from every foreign ear, through the passing centuries, the Kalevala (their national epic) the Kanteletar, (their national ballads), and the Loitsorunoja (their national charm-songs) —a literature that was to the ancient Finns what the Koran is to the Mohammedans, and what the Bible is to us.

This incredible feat of memory (for the Kalevala alone contains more than 23,000 lines, longer than Homer's Iliad) was made possible only by a succession of bards, known as *runolainen*, who in early youth were taught the several runes, songs of their folk-lore, and were expected to learn nothing else. These rhapsodists were, therefore, supported by the people, and they wandered about from village to village singing their legends, always to the same trochaic meter, with part-line repetitions, and to the same melody, as their tribe-folk assembled around the big oven-fires during the long, dreary nights of their cold and sunless winters. I myself have seen a whole village turn out, when one of these *runolainen* came to town to chant the ancient wisdom of their people.

Early in the present century (1809) Finland was ceded by Sweden to Russia, and she at once awakened research into the songs and customs that were the heir-

looms of this interesting people. It became the policy of Russia—some say in order to guard against English colonization—to encourage a return to the old form, to encourage research into their national legends; and ardent explorers were sent out at the expense of the Government, from the north of Norway to the slopes of the Altai, to dig up and preserve the fragments of the unwritten history and literature of the race.

The runes of the Kalevala furnish us with almost endless examples of the archaic traits of the Finns. Their harpers and dispensers of magic are of a very primitive type. The construction of the wonder-harp by Vainamoinen, from the bones of a monster-fish, the music of which, under the touch of his own fingers, delights and charms the world; magical horses that carry men off like the winds; boats of copper that ride the waters unaided by oar or rudder; enchanted elks that only the human tongue can slay; bows and arrows that go themselves a-hunting, and swords and spears that have a life and vengeance of their own. These and many other singular fancies remind us of the ancient Turanian tales.

At the root of the civilization of one of the greatest peoples of antiquity, the Latins, we find the Etruscans whom Canon Taylor, in his *Etruscan Researches*, tries to establish as an offshoot from the Ugrian stock, to which belonged Accads, Medes, Turks, Huns and Finns. Any Pre-Aryan population, he is bold enough to

say, must almost of necessity have been Finnic. He supposes that an Asiatic branch formed the ruling caste, while a Finnic or European formed the subject class.

On the sarcophagus of an Etruscan family, found at Clusium, Italy, we may see to-day a picture of one of the Finnic gods, Kalma. He is beardless and by no means ill-favored, carries a flaming torch over his right shoulder, and a pair of shears in his left hand with which to cut the thread of life ; he strides through an open door with a serious but not fierce look. Beneath the figure on the sarcophagus is carved the one word, *Kalma*. This is the exact name of the Kalma of Finnic mythology often mentioned in the runes of the Kalevala.

Thus the blundering Kullervo talks to the messenger who tells him on the field of battle of the death of his mother :

“Has my sweet-voiced mother perished,
Perished in the crystal fountain
Where the waters flow in beauty
Like a silver serpent winding
Through the valley to the ocean?
Home return and do her honor,
Love the dead form of my mother
In the sacred waters flowing ;
Wrap her in the robes of ermine,
Tie her hands with snow-white ribbon,
Take her to the grave of ages,
Lay her in the lap of *Kalma*.”

The runes devoted to the worship of Otso, the bear, the rising of Vainamoinen from the sea to introduce

agriculture, music and knowledge to primitive man ; the magic formulæ for charming away all human ills ; the exorcisms by which the crimson outflow of the blood of Vainamoinen was checked, or by which pestilence, famine and the fever were banished ; the tale of the mundane egg ; the legends of the sun and moon ; the worship of fire ; the birth of gold ; the forging of the sampo, or mill of prosperity ; the personification of good and evil ; the origin of the serpent ; the birth of music ; the miraculous restoration of Lemminkainen, who had been slain by the serpent of envy, and thrown into the river of death ; the old story of the duck, or swan of Time ; the Isle of Forgetfulness ; these and many other legendary tales of Finnic literature, especially when considered in the light of the fact that they had not been reduced to writing until after many of us were born, appear to bring us unmistakable evidence of the antiquity of this reserved and obscure people.

The poetry of a people with such imagery, and with such a mythology, with such a keen and appreciative sense of nature in all her forms, was certain sooner or later to attract attention. Legendary tales of Finnic heroism and of the wondrous and magical achievements of various characters were long known to exist ; but not until 1849 was there made a complete collection of their epical songs—gathered at last by Dr. Lönnrot from the lips of their wandering bards and reduced to writing.

No sooner was the Kalevala published than it attracted the attention of the leading scholars of the day, and the consensus of opinion soon gave it rank as the fifth national epic of the world.

So far as I am able to learn, the first to call attention to this storehouse of literature was Thos. Conrad Porter, whom we meet here to-day to honor—then of Franklin and Marshall College.

In June, 1855, Longfellow published a strikingly beautiful poem, *Hiawatha*, an edda (so-called) of the North American Indians. This work literally took the world by storm, and its author was heralded throughout the land as the inventor of a new style of meter—as an original verse-maker—a *poet*. Hardly was the ink dry on the first edition of that charming poem, before Prof. Porter fired the first gun in this country in defense of the national epic of Finland, his article, as scholarly as it was conservative, appearing in the *National Intelligencer* of November 26, 1854. Permit me a few extracts therefrom :

“ Now that I have given a brief description of the Finns and of their Kalevala, I wish to call the attention of the literary public to the fact that Prof. Longfellow in his new poem, ‘ *Hiawatha*, ’ has transferred the entire form, spirit, and many of the striking incidents of the old Finnic epic to the North American Indians. The resemblance is so close that it cannot be accidental, and

that without the slightest acknowledgment of the source of his inspiration. Compare the Prelude to Hiawatha with the Prelude to the Kalevala, which I have done into English, and in the same meter as the original."

" These are words in childhood taught me,
Songs preserved from distant ages;
These the tales that I inherit
From the belt of Vainamoinen,
From the forge of Ilmarinen,
From the sword of Kankomieli,
From the bow of Joukahainen,
From the borders of the Northfields,
From the plains of Kalevala.
These the lines my father chanted
As he chipped the hatchet's handle ;
These the songs my mother taught me
As she twirled her flying spindle,
Where upon the floor I sported,
Danced about her knee and prattled,
As a pitiable weakling,
As a weakling small of stature.'

" There are many other stories,
Magic songs and incantations,
That I gathered by the wayside,
Culled amid the heather blossoms,
Rifled from the fragrant copses ;
From the bending twigs I plucked them,
Plucked them from the tender grasses,
When a shepherd boy I sauntered,
Sauntered through the fields and fenlands,
Through the honey-bearing meadows,
Following the black Muirikki,
At the side of spotted Kimmo.
These the tales the coldness sang me,
This the music of the rain-drops,

These the songs the winds brought to me,
 O'er the rippling, rolling waters,
 Birds by singing in the branches;
 And the treetops spake in whispers,
 Legends that I now repeat you.'

"The hero of the epic is Vainamoinen, a mythological personage, son of the daughter of the air, who fell from the heavens into the sea, and was there wooed by the storm-wind.

"The hero of Hiawatha is the son of the West Wind and Wenonah, whose mother, old Nokomis, fell from the Full Moon upon the praries.

"Each hero sows his barley or plants his Indian corn, and in the same manner, which is that of the Finns and not that of the North American Indians; we find the famine and the fever in both epics; each recites alike encounter with a huge serpent:

"'Lying coiled across his pathway
 With his brazen crest uplifted.'

"Hiawatha sets out in his boat to conquer the mighty sturgeon,

"'Mishenamah, king of fishes,'

While Vainamoinen, in his boat, runs down a monster pike and slays him, with the aid of Ilmarinen, the blacksmith, and Lemminkainen, the wizard, just as Hiawatha brings into his contest Kwasind, the strong man, and Chibiabos, the magician, thus completing a like trio in each.

"Listen a moment to the harp-songs of Vainamoinen in the one epic, and to the flute-songs of Chibiabos in the other, and note the magical effect of the music, in each instance :

" 'When the ancient Vainamoinen '
 Touched the harp of his creation,
 All of Northland came to listen.
 Not in Metsola a daughter,
 Whom he did not touch to weeping ;
 Wept the mothers, wept the fathers,
 Wept the young men and the maidens.
 Wept the warriors and heroes
 At the music of his harp-strings,
 At the songs of the sweet singer ;
 And the Vuoksi ceased its flowing,
 Stopped to hear the marvelous music
 Of the harp of the magician.' "

" 'Most beloved by Hiawatha
 Was the gentle Chibiabos,
 He the best of all musicians,
 He the sweetest of all singers.
 When he sang the village listened,
 All the warriors gathered round him,
 And the women came to hear him ;
 Now he stirred their souls to passion,
 Now he melted them to pity.
 Yes, the brook, the Sebowiska,
 Ceased to murmur in the woodland,
 Pausing said : ' O Chibiabos,
 Teach my waves to flow in music
 Softly as your words in singing.' "

Thus Dr. Porter runs on until his pen writes this :
 " Finally, the Christ-child is born and Vainamoinen de-

parts ; the black-robed priest appears to teach christianity to the red-skins and Hiawatha departs ; each hero sails away to the West, one in his copper-ribbed boat, the other in his birchen canoe, chanting, singing practically the same song to his people left on the shore regretful."

This literary surprise, so well wrought out by Dr. Porter, was met with such a volley of adverse criticism, affirming the *Hiawatha* to be as original in its conception and treatment as any such poem can be, that the Professor on December 5, 1855, through the columns of the New York *Tribune*, returned a full broadside in defense of his first position.

To the strictures of the correspondent, " M. D. C. " who practically admits that the meter of *Hiawatha* is not original, but would have us believe that it is borrowed from the Spanish, the professor replies in substance in this wise :

" So ' M. D. C. ' would have us believe that the meter of *Hiawatha* is of Spanish, rather than of Finnish, origin. Perhaps a taste of the *Kalevala* in the original will cause some of the scales to fall from his eyes, for I can assure ' M. D. C. ' that he will not find the following lines in Mr. Ticknor's superb Spanish library :

" Sans Wanha Wainamoinen :
Mitapa kysyt minulta,
Kun saatat omille maille,

Oman kaën kukkumille,
 Oman kukon kunluwille,
 Oman saunan lampimille?
 Sans Pohjolan emanta :
 Ohoh wüsas Wainamoinen,
 Taiatko takoa sammon
 Kirjokannen Kirjaëlla,
 Yhen joukkasen sulasta,
 Yhen willan Kylkyesta,
 Yhen atrasen jywasta
 Yhen wartinan muruista."

By this time Freiligrath, the German poet, and William Howitt had joined hands with Dr. Porter from across the seas, and the latter, encouraged by such illustrious support, appeared again, this time with an elaborate article, in the *Mercersburg Quarterly Review*, under date of April 18, 1856, a copy of which I have seen in the archives of the Finnic Literary Society, at Helsingfors, *where the name of Thomas C. Porter is enrolled as one of the earliest and ablest champions of the ancient literature of the Finns.*

The smoke of the contest had somewhat cleared away when, in 1868, Prof. John A. Porter, of Yale, published a pretty translation of parts of two or three runes of the Finnish epic, only to renew hostilities, "and," to quote from the *Philadelphia Press* (Sept. 10, '88), "with Prof. Thomas C. Porter, of Lafayette College, always head and front of the attacking party."

It is but just to Dr. Porter to say, on this occasion

especially, that the literary world to-day concedes to him the victory in this long-fought contest. In my good wife's scrap-book may be found more than one thousand reviews of "*The Kalevala into English*," and these articles, with surprising unanimity affirm all that he ever claimed on this question. The press of this country and of Great Britain has reechoed, but not in whispers, his remark made to the class of '71: "*Had it not been for the Kalevala, Hiawatha would never have been written.*"

If the epic of Finland has been introduced to English readers, to Dr. Porter belongs the first praise, for it was his teaching that fastened the intrinsic beauties of this poem in the mind of the translator; it was his encouragement and active support that cheered and sustained him until the task was completed; and it was his revision and careful pruning of the manuscript that gave the translation what of merit it possesses.

But Dr. Porter's work in the field of Finnish literature is not confined to the Kalevala, for had I the time I could give you many a gem-translation from his poetic pen. Permit me to recite his beautiful *famine-idyl*, from Runeberg :

"THE LORD PROVES ONLY; HE DOES NOT FORSAKE."

"Far up on Saarijärvis downs there dwelt
The peasant Paulo on a cold, bleak farm,
Dwelt with his wife and child, and tilled the ground,

Dug ditches, ploughed and sowed, then waited for
 The harvest from the Lord.—Spring came
 And on the fields melted the heaps of snow,
 So that the floods swept half the crop away ;
 The summer came, and showers of hail beat down
 Half of the shooting ears ; the autumn came
 And blighted by its frost all that survived.—
 The wife of Paulo tore her hair, and said :
 ‘ O Paulo, Paulo, thou unlucky wight !
 Let us take staves ; God hath forsaken us ;
 ’Tis hard to beg, but harder yet to starve.’
 Then Paulo took her by the hand, and said :
 ‘ *The Lord proves only ; He does not forsake.*
 Mix with the meal half bark, and I will dig
 Double as many ditches, and await
 The harvest from the Lord.’—Birch-bark she ground,
 And mixed it with the meal. The good man dug
 Just twice as many ditches, sold his sheep,
 Bought rye, and sowed it in the fields.—Spring came,
 And melting snows swept not the crop away ;
 The summer came, and showers of hail beat down
 Half of the shooting ears ; the autumn came,
 And blighted by its frost all that survived.—
 The wife of Paulo smote her breast, and said :
 ‘ O Paulo, Paulo, thou unlucky wight !
 Let us die now : God hath forsaken us.
 ’Tis hard to die, but harder yet to live.’—
 Paulo then took her by the hand, and said :
 ‘ *The Lord proves only ; He does not forsake.*
 Mix with the meal half bark, and I will dig
 Deep ditches, twice the number, and await
 The harvest from the Lord.’ Birch bark she ground,
 And mixed it with the meal ; the good man dug
 Deep ditches, twice as many as before,
 Sold kine, bought rye, and sowed it.—The spring came,
 And melting snow swept not the crop away ;
 The summer came, and beating showers of hail
 Smote not the shooting ears ; the autumn came

And on the fields, untouched by blighting frost,
 The golden grain stood ready for the reapers.—
 Then Paulo fell upon his knees, and said :
'The Lord proves only ; He does not forsake.'
 Down on her knees beside him sank his wife,
 And to the gladness of her heart gave vent :
'O Paulo ! Paulo ! thrust the sickle in ;
Now can we lead a happy life again,
Can eat, with hearty zest, of bread all rye.'—
 But Paulo took her by the hand, and said :
'O woman ! he alone is truly tried
Who in a time of need does not forsake
His fellow-man. Make still the bread half bark,
For all our neighbors' fields are frozen bare.' "

There breathes throughout this literature the spirit of the country that produced it. Short phrases and little touches open up to us long vistas of birch forests, with distinct glimpses of roaring waterfalls. We see the blue back of the Bothnian Gulf with its pebbly margin ; we see the deep green lakes and the ever-winding rivers, and we live in the innermost lives of the peasants and fishermen that inhabit their shores. We see face to face the great heroes and demigods of ancient Suomi, and are awed by their mighty and magical presence. The spells of enchantment that Vainamoinen throws over his enemies, and with which he gives life to the dead, are also thrown over us as we eagerly read of his heroic and miraculous deeds.

We are among an intensively imaginative people to

whom song comes as the most natural expression of joy or sorrow, terror or triumph—a class that lies near to nature's secrets, and not out of sympathy with the falling snows, and the flying sands, and the rolling rocks, and are at home with the wild, weird kin of the winds and woods and waters.