

March 2, 1917.

Summary

SOME OF THE MORE PROMINENT LINES OF ADAPTATION OF THE RESULTS OF
RESEARCH IN THE EARTH SCIENCES TO PUBLIC SERVICE, WITH ESPECIAL
REFERENCE TO FURTHER DEVELOPMENT IN THE UNIVERSITY OF CHICAGO

1. Public appreciation of the services of geological investigation is best expressed by the fact that practically all civilized nations maintain official geological surveys. Our own general Government has been expending between one and two million dollars in such surveys for many years, while most of the States supplement this with additional work in the public interest.

2. The relationship of the University of Chicago to such public service is perhaps best indicated by the fact that a score or more of its men are engaged upon the National Geological Survey; 10 of its men are State Geologists, about 25 percent of the total number; while about 25 of its men are engaged in private geological work of an economic nature, some of these occupying positions of great responsibility. The Department, however, makes its greatest effort in scientific and educational lines and regards this work as its greatest public service. About 45 of its men are teachers in universities and colleges and about a dozen of these are Heads of Departments of Geology.

3. The present stress of demand for such scientific training as is given here is illustrated by a telegram received by the Geological Department a few days ago asking how many men of specified attainments could be recommended to accept work in a specified region at enticing compensation and the reply of the Department that it could not furnish

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compensation and the reply of the Department that it could not furnish

any, as none of its graduates were known to be unemployed, and no one of its present students was willing to break his course to accept even such enticing service.

3. The line of most tangible prospective service to the immediate constituency of the University lies in a joint investigation of the possibility of converting, on the ground, the fuel resources of geological strata within reach of Chicago into gas, electricity, or other sources of heat, light, and power, transporting only these refined products to the city, thus conserving health, comfort, and property. This proposition seems now to be on the eve of practicability and there is a fair prospect that by specific research it might be rendered not only practicable, but even commercially economical.

4. More or less tributary to such an investigation, but springing from an independent purpose of its own, a member of the staff of the Department has made special investigations into the gases of rocks, as well as the volatile material in rocks, especially that in coals and carbonaceous deposits, and has investigated and made contributions to the amelioration of the dangers arising from deleterious and explosive gases in mines, a matter susceptible of much further extension.

5. To some extent investigations have been made on the genesis of metallic ores and their secondary enrichment, as also upon several other classes of deposits of industrial value.

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search for practicable modes of extraction of these valuable fertilizers.

7. The investigation of soils has an indispensable geological factor, as well as its chemical, physical and biological factors, and the cooperation of all these lines of inquiry is scarcely less than essential to full success in the maintenance and management of soils.

8. In these and several other lines, both the Departments of Geology and Geography are making contributions to the utilization and conservation of natural resources, in which again cooperation with other sciences is indispensable.

9. The Department of Geography is conducting a special historical inquiry into the development of communities in response to their physical environment and the natural resources available to them, and is thus seeking the foundation of human development not only in a local but in a general sense. The results of such inquiries carried to completeness should be serviceable guides in forecasting the further development of communities and community interests, material and humanistic alike.

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Copy

University of Wisconsin.

Nov. 23, 1907.

Eschscholm

Prof. T. C. Chamberlin,
University of Chicago.

My dear professor Chamberlin,

I am returning to you, by express, your paper on The Former Rates of the Earth's Rotation, together with papers by MacMillan and myself.

I have gone over with a great deal of care your very remarkable paper, and must express to you the great pleasure it has been to me to follow the reasoning which you have brought to bear from so many fields of thought upon this fundamental problem. I know of no piece of work in science that has appealed to me so strongly. It goes back to the fundamental methods of the great masters like Newton and Laplace. I am thoroly convinced that the method of attack that you have adopted is much better than any method dependent upon mathematical analysis that can be applied to these problems. I do not know of a stronger piece of naturalistic logic.

My enthusiasm has increased as I have dwelt upon many of the matters you have brought up which involve points entirely novel to me. I refer in particular to the hypothesis porposed by you in pages 40 to 50 to account in part for the tides by the tilting or rocking of the lithosphere under the basins in which the tidal waters are held. The strength of this hypothesis in my mind increases more and more as I dwell upon the subject, especially when considered in relation to the tidal vibrations in the harmonic

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I have taken the liberty of having my paper retypewritten as I found that the mathematical equations had been left in such shape by the former typewriter that I had difficulty myself in interpreting them, and I know the printer would have difficulty with them unless the symbols were put in clear form. I also supply the missing table and the figure referred to in the text.

Very respectfully yours,

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PRESIDENT JUDSON

Brief addresses are to be made by alumni of the Departments concerned, and I will ask the Dean of the Ogden School of Sciences to introduce them.

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The departments of the Earth Sciences have many men in various parts of this and other countries, of whom they are very proud. Though like the University itself they are still young and much of their large work is doubtless before them, many of them already have achieved distinction in their several fields of work. In the dedication of this building today, we are asking several of these men, from one place and another not so far removed but that they might reach Chicago, to say a few words on certain phases of the subjects with which these Departments deal. The first of these is Dr. Eliot Blackwelder, now of the University of Wisconsin, a Chicago boy who started his college course with this University and is now an honored and prominent member of the faculty of the great state university to the north. He will speak to us on the subject: The Earth Sciences and Education. ~~Professor Blackwelder.~~

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Not all the former students of the Department who are now away from the University are connected with educational institutions, in the ordinary sense of that term. Many are connected with the National Geological Survey and some with State Geological Surveys. The next man from whom we shall hear, Mr. Frank W. DeWolf, was for a time connected with the U. S. Geological Survey, and is now Director of the Geological Survey of this state, and everybody who is interested in geological science might well wish that every geological survey was in as good hands as that of Illinois. Mr. De Wolf will speak on the subject: Governmental Geological Surveys.

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Unlike the two men who have just spoken, the next speaker did not begin his college work on this campus. He came to us as a graduate student, but from the day when we first became acquainted with him, we were sure that he would do great work. After a brief connection with the United States Geological Survey, during which he made a reputation in economic work, he was for a time connected with this University; but the University of Minnesota having an eye for good men, called him to the headship of the Department of Geology there. I have great pleasure in presenting Professor William H. Emmons, who will say a few words on The Earth Sciences and Industry.

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PROFESSOR EMMONS

The two fundamental industries of civilization are agriculture and mining. Although both of these depend directly upon geological conditions, the science of geology thus far has been engaged in a larger measure in the development of mining.

The United States is more nearly than any other a self-contained nation; within its boundaries are found all ^{mineral} materials utilized by man in quantities, except tin, platinum, nickel, ^{potash} and niter, which together make up only about 8 per cent of the world's mineral production. In all the world no place is known where mineral resources equal either in variety or in amount are concentrated in so small an area. The United States produces about 41 per cent of the world's production of metals and mineral fuels; 39 per cent of the world's coal; petroleum 63 per cent; iron 41 per cent; copper 55 per cent; gold 21 per cent; lead 30 per cent; zinc 31 per cent.

Moreover, this country probably contains a larger proportion of the known mineral resources of the world than its proportion of the annual production, giving promise that it will maintain or advance its present commanding economic position. As to the quality of mineral resources, the position of this land is preeminent. Speaking broadly and of large deposits, its coals are of the best; its iron ores among the purest; its oils of the highest grade; its copper most advantageously beneficiated.

With such surroundings it is not surprising that the science of geology in this country should have been developed along economic lines. These marvelous areas of mineralization have served as fields in which many fundamental principles have been discovered and in turn

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geology has rendered a large service in the exploration and exploitation of deposits and to the development of the many industries depending upon them.

There is no line of cleavage between general geology, embracing all its branches, and the so-called economic geology or science of mineral deposits. The principles utilized, the fundamental data, even the field methods are approximately the same. Because every field and every deposit is in a sense a problem unto itself, workers in the field of applied geology, perhaps in as large a way as in any other applied science, are first of all investigators, working to develop the science of geology while seeking reserves of ore.

Fostered by generous appropriations of the Federal and State governments on account of its services to their peoples; actively supported by some ten or twelve universities in America, the science of geology has within the past half century made rapid progress. No other nation has shown such appreciation of its value and no other nation has profited so much by its service.

The advance of the science has been steady. It has served the industries because its students have taken a serious view of their obligations to the science; because there has been the closest cooperation and a free exchange of ideas between the students interested chiefly in the fundamental principles of the various branches of the earth sciences and those seeking rationally to develop mineral deposits.

In recent years, particularly in the last twenty years, there have been organized in America, and to a less extent abroad, geological staffs to serve individual companies or groups of companies. Indeed today nearly every large mining industry has its own corps of

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geologists. Thus there have been taken from the field of pure investigation many men of great ability and attainments and some have looked with apprehension on a threatened loss. But many of these men have found it possible to make large contributions to the science. The effect has not been to commercialize geology, but rather to put mineral exploration on a scientific basis.

Economic geology utilizes all other branches of earth science: historical, structural, and metamorphic geology; petrology, paleontology, etc. The fundamental conceptions of earth history and petrogenesis are the groundwork on which it rears its structure. Its results are valuable in proportion to the truth of its theories. Thus economic geology depends in a large measure on the data of cosmology and on a knowledge of fundamental principles. It is the research in these fields and the sound teaching of fundamental knowledge that has placed this University in its present enviable position in the field of the earth sciences. These contributions to knowledge have in a large way influenced and advanced applied geology by elucidating the principles ^{are} ~~on~~ which ~~is~~ its framework.

By serving the industries the earth sciences have themselves advanced. The mineral deposits are the laboratories where nature carries on her vast experiments. The geologist should seek in them not only the ores, but also to interpret the laws that operate in their deposition. So best can his science be of service to the industries of the earth, all of which are closely related to or conditioned by the nature of its rocky structure.

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PROFESSOR SALISBURY

No one of our alumni who is to speak today has been so closely connected with the Department as the next speaker. His work as a student, from the time he entered college until he received the Ph.D. was here, and long before he received the Doctor's degree he was a member of the instructional staff. We were very loath a year since to let him go, but we consoled ourselves with the thought that Harvard needed a Chicago man. We are glad to welcome Dr. Atwood today, and we shall always be glad to welcome him. His topic is, The Earth Sciences and General Culture.

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The next speaker comes to us from the University of Missouri. He came to us as a graduate student, and after receiving his Ph.D. degree, went to Oberlin, where he built up a strong Department of Geology. From there he went a few years since to the University of Missouri, where he is repeating the good work he did at Oberlin. He is to say something to us on the Lessons of Ancient Life. Professor Branson.

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PROFESSOR BRANSON

It is a great pleasure to me to bring the greetings of the Department of Geology of the University of Missouri to its parent Department. It is a particularly great pleasure to see the completion of this great building, while the man to whom all of us owe so much in inspiration and of whom we like to speak as the great Geologist, is still able to enjoy all of the advantages for research and for continuation of his work that it offers. It is another pleasure that the department that I left ten years ago is, in its membership, so largely intact, having lost only one or two of the teachers whom we like to well to remember. Still another pleasure I may mention from my own point of view, in coming from a little different type of work from that to which this building is dedicated, the work of paleontology, is to know that this building gives that department a chance that it has long needed.

My memory of Walker Museum, though, is not a memory of crowded halls, and of little places for conference with students, but rather a place where great inspiration came to me. I think that this prevented my noticing that it was a particularly over-crowded place.

I was asked to speak on some lessons of the early life. The large lessons of the early life have been long known to paleontologists, and only details of these lessons are being worked out. I should say that the first lesson that ever came to me in the work in paleontology, and the lesson that has been most firmly impressed on me as I have gone on with the work is the lesson of the gradual change in the forms of life, the gradual taking on of new

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types of variations and these gradual changes growing into larger and larger changes--these changes not always being in the direction of utility, not always in such a direction that we can see that they would be any advantage at all to the animal or plant; but that type of change that is of utility or advantage being the one that is usually perpetuated.

A second lesson is that the time when these changes came about was the time when animals or plants were given opportunity to select new environments or were forced into new and varied environments. To illustrate by marine life; sea animals if they were cooped up in some small bay, underwent changes but they were small in number and limited in amount compared with those that came about if the waters spread and the animals were allowed or forced to migrate into new and varied environments.

A third lesson, emphasized often by Doctor Williston when I was a student, is that it is the potentially young form that makes rapid and great changes, and that old forms have lost their evolutionary vigor.

The paleontologist gathers the facts of evolution as they are preserved by the fossils in the rocks, but he can do little with methods of evolution. The determination of these must be left pretty largely to the experimental biologist. Unfortunately, as it seems to me, many of the experimental biologists have begun by neglecting the facts of paleontology, and the history of the animals and plants on which they are at work, and as we have seen in the recent abandonment, or practical abandonment, of the notion of great mutations or saltations, have arrived at many conclusions that were vitiated by the paleontologic evidence in advance of the

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PROFESSOR CASE

In speaking to this title I must confess to some embarrassment arising from a wealth of material and the various lines of thought suggested.

Shall I adopt a high moral tone and suggest how the life of each extinct vertebrate carries some suggestion to us? That with the Mosasaurs we may dive deeply into things, or with the Pterodactyls rise above our surroundings? Shall I suggest to the students present that they consider with respect the capacious maw of a Paleozoic Stegogephalian and warn them to take in ideas as Eryops gathered in the shoals of little fishes?

May I suggest that the fate of Brontosaurus warns us that mere bigness is not success, and that many an institution may well pause in its struggle for bulk and numbers to contemplate the slough into which Brontosaurus, the biggest of institutions, finally sank?

Shall I point out that from the very beginning fish, amphibians, reptiles and mammals have sought to solve the question of arms and armor? In every group the weapon of offense, the projectile, has grown ever more powerful and the armor ever heavier. Would it be too far-fetched and presumptuous to call attention to the fact that in every case this struggle has ended in the extinction of both contending sides?

Or finally, would it be worth while to suggest that Doedicurus, the great Glyptodont of South America, its tail converted into a great club of bone armed with stout spines, found it desirable to "walk softly and carry a big stick?"

Any attempt to recount the advance of science from a study of extinct vertebrates would be beyond the purpose of this gathering, but it were unwise on such an occasion to fail to mention with due

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honor the name of the first incumbent of the chair of Vertebrate Paleontology in this University, Dr. George Baur. Brilliant beyond most workers in his line, erratic in his genius and tragic in his death, he left a series of acute observations, ~~and~~ far-reaching generalizations which have enriched the literature not only of Paleontology but of Zoölogy and evolution. Those few who penetrated ^{beneath} the peculiarities of his genius found a friend and a teacher whose memory will long be green. Future workers will never consign his ^{writings} ~~work~~ to the limbo of forgotten publications. ^{space}

But under my title I may claim another line of thought, and it is eminently appropriate that I, a former student in this University, and one of a group of speakers made up of former students, should voice the idea here.

To have done or written things that live is to be historic. Animals or men need not necessarily wait for petrified bones or chiseled stone to make them a part of history.

It is the quality of a vertebrate to stand for the truth and the right, and to dare to reach forward beyond the already known. To be a strong support for those who come later and would aid in the work of advancement.

And so I bring the tribute of men who have exchanged the youthful enthusiasm of their student days for the appreciation and admiration of mature years and the thoughtful consideration of the ideas imparted to them.

Chicago University has ever had in this department a group of teachers who have given ungrudgingly and splendidly of their time and skill and knowledge to aid the men who would come after. To two men especially, of this group, the elder men of the staff, heads

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5

of the department of geology and its related science, vertebrate paleontology, I would say that we, your former students, gather here as much to bear witness to the effect of the Teachings of historic ^{two} vertebrates as to congratulate you and our alma mater on this magnificent addition to the efficiency of our departments.

Years have only added to our admiration ^{for} of your ^{ability} ~~qualities~~ as leaders, and withal, our deep affection for your personal qualities. Under less favorable conditions you have trained the men we represent. The next generation should be better trained, but we claim that after all it was the men, the whole staff of the group of earth sciences, that have given Chicago University its commanding position in geology and paleontology, and again on this auspicious entrance into a new era and in this wonderful building we render thanks for the Teachings of the Historic Vertebrates.

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PROFESSOR SALISBURY

The last of our alumni who is to speak to us today occupies two important positions. He is Head of the Department of Geology at the State University of Iowa, and at the same time Director of the Geological Survey of Iowa. He has not fallen between the two positions and all of us who know him, know that he will not. We are glad to welcome Professor Kay, who will say a few words on the Earth Sciences and the Loftier Interests of Mankind.

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PROFESSOR KAY

Among the many grand concepts of the scientist is that of the universe with its millions of solar systems moving through space with various velocities and in different directions, the universe whose boundaries lie far beyond the range of the most powerful telescope,--in the words of Pascal, "an infinite sphere the center of which is everywhere, the circumference nowhere."

From the facts that are now known about the heavenly bodies, the scientist has speculated as to how solar systems come to be, has speculated as to how our solar system came to be with its sun as a center, surrounded by the planets of which our earth is one. # The earth as a part of our solar system has long been of interest to the student of earth science. He has attempted to trace its history from the earliest stages of its development until it had attained its full size and he has endeavored to decipher the successive steps in the record from Archean time to the present. The text book ever lies open to him and he is invited to read. ~

Truly may he say as did a wise man of old, "Speak to the earth and it shall teach thee." Or, in the words of Walt Whitman:

"The earth is rude, silent and incomprehensible at first--
Be not discouraged--keep on--there are divine things
well enveloped;
I swear to you there are divine things more beautiful
than words can tell."

The geologist has been able to interpret many of the characteristics of the earth during the successive stages of its development involving millions upon millions of years. He has traced the past record of life from lowly organized forms to forms highly developed. He has discovered the unbroken current of life, flowing on and on

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in undiminished volume from pre-Cambrian time to the present. He has seen that by the divine method in the universe Man came to be.

"A fire-mist and a planet--
A crystal and a cell--
A jelly-fish and a saurian,
And caves where the cave-men dwell;
Then a sense of law and beauty
And a face turned from the clod
Some call it Evolution
And others call it God."

As man has come to see himself linked to the millions of years of the past and thinks of himself in relation to the millenniums that are yet to be, he realizes that he is part and parcel of the grand process of development. He realizes that during the moment of time that he is permitted to act his part upon the stage his mission is to take his one step forward and upward, to lift humanity a little higher than he found it and to leave the earth a little better for his having lived, to build a structure that shall be more enduring than the rocks of the building we are now dedicating.

"I stood beside old Ocean
On a fair summer's day,
And built a marv'lous structure
Upon the sand in play.
The tide came in, and wave on wave
Crept higher up the strand,--
The structure fell--it disappeared,--
I'd built upon the sand.

The words of the wise Master
Came back to me once more,
As I stood beside the leveled sand
Where I'd labored on the shore,
I built again, and now the storm
Broke in its force and shock,
But still the structure reared its form--
I'd built upon the rock.

I thought of human souls I'd known,
Now passed to the other shore,
And some were but faint memories,--
Some lived each day the more.
It was the lesson of the hour
Wrought out in spirit form,--
'Tis characters built on the rock
Outlast the wave and storm."

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May the young men and women who study the earth sciences in Rosenwald Hall beel to see the true meaning of life, to see their duty to humanity. May they go out to build structures that will not crumble with the coming years; may they build structures that will be immortal.

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PROFESSOR SALISBURY

It is fitting that our formal exercises this morning should close with a few words from the man who needs no introduction. Professor Chamberlin.

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Professor Chamberlain.

Mr. Salisbury
The University of Chicago

Office of the Auditor

H. Judson

March 18, 1921.

Isaac
For instruction
other
My dear President Judson:

I beg to enclose herewith correspondence and statement of courses of instruction by R. T. Chamberlin since his appointment beginning July 1, 1912.

Not an account of student
As a result of my inquiry you will note that Miss Carter calls attention to the fact that but one course was given during the Autumn Quarter 1920. Not receiving an early reply from Miss Carter I called her on the telephone concerning this matter and she informed me that this was a special case, - that Mr. Salisbury, who was then in the office, would speak with me concerning it, which he did. He stated that he understood Mr. Chamberlin had a special arrangement whereby the amount of his instruction was more or less of a secondary matter and that his particular activity was that of research. From the statement of his instruction you will observe that in only one year has he given full work, and in that year one of the courses was given in collaboration with Professor Salisbury. In one year he was paid extra for cash, presumably for extra work, whereas during the course of the year he did not do full work. In another year he was allowed extra vacation in a Fourth Quarter, during which year he gave only one-half the regular work.

Professor Salisbury further stated that this practice obtained in certain departments and was predicated on

2 - President Judson

the theory that the University's main activity was research rather than instruction.

I have investigated the minutes of the Board of Trustees and find no mention made of any exceptional conditions in connection with Mr. Chamberlin's appointment or re-appointments, and am wondering if you are familiar with this situation and its financial implications. Do you think that the allowance for extra vacation credit in the Spring Quarter 1919 should stand?

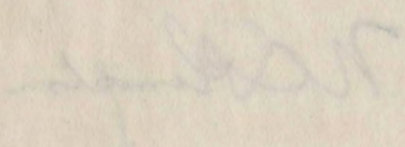
Yours very truly,

W. C. Plimpton

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Yours very truly,



C O P Y

March 14, 1921.

My dear Miss Carter:

I notice on the record of residence of an instructor that Mr. R. T. Chamberlin is credited with being in residence in the Autumn Quarter, but a small figure (1) is inserted. Do I understand that this indicates that he gave only half work? I believe this record was made by you when the cards were in your custody.

Yours very truly,

N. C. PLIMPTON

Miss Irene L. Carter,
Faculty Exchange.

COPY

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Miss Irene L. Carter,

Faculty Exchange.

C O P Y

Office of the Dean

March 16, 1921.

Mr. Plimpton,
Faculty Exchange.

Dear Mr. Plimpton:

I have your note of March 14th in regard to the vacation credit card of R. T. Chamberlin. I did not make the records on cards in the Autumn Quarter, but I have looked up the sheet sent in by the head of the department at that time, and on this sheet Mr. Chamberlin is reported as giving one course. I judge therefore that the "(1)" means that he was giving half-time work.

Very truly yours,

(Signed) Irene L. Carter

For the Dean.

COPY

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Recd. by Exchange.

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For the Dean.

STATEMENT OF COURSES GIVEN BY R. T. CHAMBERLIN

Summer 1912	Vacation
Autumn 1912	1 Course
Winter 1913	1 Course
Spring 1913	2 Courses
Total	4 Courses, or 2/3rds regular work.

Summer 1913	Vacation
Autumn 1913	2 Courses
Winter 1914	1 Course
Spring 1914	1 Course
Total	4 Courses, or 2/3rds regular work.

Summer 1914	Vacation
Autumn 1914	1 Course
Winter 1915	2 Courses
Spring 1915	1 Course
Total	4 Courses, or 2/3rds regular work.

Summer 1915	Vacation
Autumn 1915	1 Course
Winter 1916	1 Course
Spring 1916	2 Courses
Total	4 Courses, or 2/3rds regular work.

Summer 1916	1 Course
Instruction in two courses was given in the first term, equivalent to one course for the quarter. Extra compensation, \$225., was paid for this instruction. Therefore, this instruction is not included in the statistics for the year 1916-17.	

Autumn 1916	1 Course
Winter 1917	1 1/2 Courses
Spring 1917	2 Courses
Total	4 1/2 Courses, or 3/4 regular work.

STATEMENT OF COURSES GIVEN BY R. T. CHAMBERLIN

Summer 1913	Vacation
Autumn 1913	1 Course
Winter 1913	1 Course
Spring 1913	2 Courses
<u>4 Courses</u>	
Total	4 Courses, or $2\frac{2}{3}$ ds regular work.

Summer 1913	Vacation
Autumn 1913	2 Courses
Winter 1914	1 Course
Spring 1914	1 Course
<u>4 Courses</u>	
Total	4 Courses, or $2\frac{2}{3}$ ds regular work.

Summer 1914	Vacation
Autumn 1914	1 Course
Winter 1915	2 Courses
Spring 1915	1 Course
<u>4 Courses</u>	
Total	4 Courses, or $2\frac{2}{3}$ ds regular work.

Summer 1915	Vacation
Autumn 1915	1 Course
Winter 1916	1 Course
Spring 1916	2 Courses
<u>4 Courses</u>	
Total	4 Courses, or $2\frac{2}{3}$ ds regular work.

Summer 1916

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Autumn 1916	1 Course
Winter 1917	1 $\frac{1}{2}$ Courses
Spring 1917	2 Courses
<u>4 $\frac{1}{2}$ Courses</u>	
Total	4 $\frac{1}{2}$ Courses, or $3\frac{1}{4}$ regular work.

STATEMENT OF COURSES GIVEN BY R. T. CHAMBERLIN

Summer 1917	Vacation
Autumn 1917	1 Course
Winter 1918	2 Courses*
Spring 1918	2 Courses
Total	5 Courses, or 5/6 regular work.

*One of the courses in the Winter Quarter was given in collaboration with Professor Salisbury.

Summer 1918	1½ Courses
Autumn 1918	½ Course
Winter 1919	1 Course
Total	3 Courses, or 1/2 regular work.

Spring 1919 2 Courses
for which extra vacation credit
of \$833.33 was allowed, which is
still standing to Mr. Chamberlin's
credit.

Summer 1919	Vacation
Autumn 1919	2 Courses
Winter 1920	2 Courses*
Spring 1920	2 Courses
Total	6 Courses, or full work.

*One course during the Winter Quarter 1920 was given in collaboration with Professor Salisbury.

Summer 1920	Vacation
Autumn 1920	1 Course
Winter 1921	2 Courses
Spring	Vacation
Total	3 Courses, or 1/2 regular work.

STATEMENT OF COURSES GIVEN BY R. T. CHAMBERLIN

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Autumn 1917	1 Course
Winter 1918	2 Courses*
Spring 1918	2 Courses
Total	5 Courses, or 5/6 regular work.

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Summer 1918	1 1/2 Courses
Autumn 1918	1/2 Course
Winter 1919	1 Course
Total	3 Courses, or 1/2 regular work.

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Summer 1920	Vacation
Autumn 1920	1 Course
Winter 1921	2 Courses
Spring	Vacation
Total	3 Courses, or 1/2 regular work.

+ 13

The University of Chicago

Department of Geography

September 21, 1922

Cross Ref.
Lyons

The President of the University
Faculty Exchange

My dear Mr. President:

A few days ago Dr. Alfred H. Brooks of the United States Geological Survey was here and I seized the opportunity to ask him about the administrative work which Mr. Bastin did in the Survey. He said that Mr. Bastin was so successful that George Otis Smith, Director of the Survey, had several times told him that he wished Bastin might succeed David White as Chief Geologist. I understand this official is the principal administrative officer of the organization.

It occurred to me that you might be glad to have this bit of testimony concerning Mr. Bastin's administrative ability.

Very truly yours,

Harlan H. Barrows

HHB/GM

The University of Chicago

Department of Geography

September 21, 1922

The President of the University

Faculty Exchange

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Very truly yours,

Arthur H. Brown

HNB/GM

4 13
The University of Chicago

Department of Geography

September 21, 1922

September 23, 1922.

My dear Mr. Barrows:-

The President of the University
Thank you for your note of
Faculty Exchange
the 21st instant in regard to Mr. Bastin.

My dear Mr. Very truly yours,

A few days ago Dr. Alfred H. Brooks of the
United States Geological Survey was here and I
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Mr. H. H. Barrows, The University of Chicago.
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The University of Chicago
September 23, 1932

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HPJ:CS

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HPJ:CS

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF GEOLOGY

Chamberlin
T. C. CHAMBERLIN (EMERITUS)
ROLLIN D. SALISBURY
STUART WELLER
ALBERT JOHANNSEN
EDSON S. BASTIN
R. T. CHAMBERLIN
J. HARLEN BRETZ
PAUL MACCLINTOCK
JEROME D. FISHER



REPLY TO THIS COMMUNICATION SHOULD
BE ADDRESSED TO THE UNDERSIGNED AT
ROSENWALD HALL, THE UNIVERSITY OF CHICAGO

CHICAGO , Sept. 2, 1922.

President H. P. Judson,
The University of Chicago.

My dear President Judson:

I appreciate your kindness in inviting a conference on the problem of the Geology Department after my return from Beloit, which will probably be Tuesday evening. It will perhaps help prepare for the conference if I give a sketch of the geological talent of the country outside our University.

I have given the matter much thought during the last two months and this will be only a sketch of the bare outstanding features:

At Harvard, the man of widest reputation is Davis, who retired ten years ago, at 62.

Next in order is Daly, primarily a petrologist, specializing in igneous rocks, but widely interested in geological problems. He is best known for his freedom in hypothesis and the bizarre nature of some of these, to wit: The glacial control of the coral reefs; an ancient limeless ocean, etc. He is well up on modern technical aspects of the subjects on which he specializes, but at the same time rests his views on the general concepts of a molten earth about as held at the middle of the last century. He is a Canadian by birth but I think had some of his education at Harvard. He has a professorship that gives him much time for research and writing, is 51, and probably would not care to change to a new situation. At any rate, he would be a misfit here.

At Yale, the outstanding man is Schuchert, a paleontologist, but widely interested in problems of general geology; ranks well, but not especially high; is 64, and probably would not care to change his position. In any case would duplicate Weller's field and be less sure-footed, though more in the public eye.

At Columbia, the outstanding man is Kemp, an economic geologist who rarely writes or talks on any other line, his affiliations being chiefly with the Department of Mining Engineering. He is a man of wealth, has recently been compelled to take a year off on account of health (nervous trouble, I think), is 63, would not probably accept, would duplicate Bastin's field if he did, and would not well fit the situation.

At New York there is also Osborn, Director of the Museum of Natural History, a paleontologist specializing on mammals and man,

a millionaire who besides has large museum resources at his command, is now directing an extensive exploration in Asia, has many social and official relations in New York, is 65, and probably would not accept.

At Princeton, the strong man is Scott, a vertebrate paleontologist, who has made large collections in Patagonia and elsewhere; is 64, and probably would not care to leave his collections for executive work elsewhere.

At Washington, the outstanding man is Walcott, Secretary of the Smithsonian Institution, who is 72 and unavailable.

The next man in order at Washington is David White, a paleobotanist, who has grown up with the Survey, and is now Chief Geologist; has had no academic experience; is 60, and probably would not be willing to exchange his commanding position for the direction of an educational department at his age.

At Montreal, the strong man is Adams, whose special line is petrology and the crystalline formations, and experiments under high pressures. He has been dean of the Engineering Department, which has furnished the facilities for his experimentation; was Acting Principal in 1920; is 63, and is probably unavailable, as he is a native of Montreal and has strong Canadian and English ties.

At Toronto, the outstanding man is Coleman, but he has recently undergone a very severe and critical surgical operation, from which I think he has only partially recovered, and is 70.

At the University of Wisconsin, the strong man is Leith, the best man from our point of view, in my judgment, in the country, since he is able, sound, and only 45. His specialty is economic geology and the crystalline terranes. He has a very lucrative professional practice and some arrangement with the University by which he is free to be absent at almost any time these engagements may require. He was chosen by the six great iron and steel manufacturing corporations which have been negotiating mergers during the last year, as their sole referee respecting the value of their ore properties, and his fee for this must have been large. He went to South America to inspect properties there as well as in this country and Canada. His field is in some large part that now occupied by Bastin. He is being urged by a section of the faculty for the Presidency at Madison, but told me that he was unwilling to make "the sacrifice." I do not think he would be available, but I think he would be the best man to give you an outsider's opinion of other men of the country, if you desired it.

At the University of California, the leading man is Lawson, a Canadian of Scotch extraction, whose special work has chiefly been given to the crystalline formations. He is a man of some ability but aggressive and belligerent, the fighting cock of the profession, a sharp antagonist of Van Hise and Leith on Lake Superior geology; is 61; would not fit in well here, and might disturb relations with our neighbors at Madison and Minnesota.

a millionaire who besides has large museum resources at his command, is now directing an extensive exploration in Asia, has many social and official relations in New York, is 65, and probably would not accept.

At Princeton, the strong man is Scott, a vertebrate paleontologist, who has made large collections in Patagonia and elsewhere; is 64, and probably would not care to leave his collections for executive work elsewhere.

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At Stanford, Bailey Willis has just retired at 65, and Eliot Blackwelder is just entering upon the directorship of the department there, and could not very well throw it down at present. He is, as you know, one of our men and one of the best outside the Department here. My forecast is that he will make a fine record, but probably not a really great one. He could not bring to us a very notable reputation, though a good one.

The most conspicuous of our own men is Atwood, President of Clark, who is building up there a Department of Geography which is apparently intended to form the headship of the University in a sense. This is nearly an ideal position for Atwood. He is a man of striking abilities in certain lines, coupled with limitations in other lines. He is well adapted to the situation which he has made for himself. His earlier work was chiefly in geographic and physiographic lines. He was not specially strong in the strictly geological lines, particularly those of a difficult dynamic nature. He is not fond of digging along and patiently in the dirt at the roots of things, or burrowing unseen below the surface, and would probably not wish to undertake a position where demands in that line were intensive. Frankly, he would have difficulty in handling the advanced classes in the graduate school, in the present critical transition period of geology. By this I do not refer wholly to the genesis of the earth and what hangs directly on that, but to two other phases of our science, where radical revision of a very searching and extensive order is imperative:

(1) It is now practically demonstrated by the character of the earthquake waves that pass through the interior of the earth and are recorded at seismic stations that the earth is elastico-rigid (neglecting minor qualifications of no moment here). As a result nearly all the basal interpretations and doctrines of geology must be reconstructed to fit the elastic-solid nature of the earth. Nearly all of these, as they now stand, have been derived from the concept of a molten earth which was supposed to pass into a viscous earth, so far as it became solid. Besides it was supposed to be dominated by an inheritance of excessive heat. All our great doctrines, such as deformation, vulcanism, isostasy, paleogeography, etc., so far as they are questions of today, must be overhauled and made to fit the evidences of solidity. This does not rest upon the seismic evidence alone, but is supported by the evidences of the body tides (most notably brought out by the brilliant work of Michelson, Gale and Moulton, on the body tides), and also by the nutation of the earth, or the "wobbling of the pole" as it is popularly termed.

(2) The new disclosures of physical investigation respecting the constitution of matter make it practically certain that an open dynamic structure analogous to a planetary organization must be substituted for the dense, hard, intractable notion of matter derived from the old atomic view. The revision of ideas of earth matter certain to be enforced by this revolution of the basal

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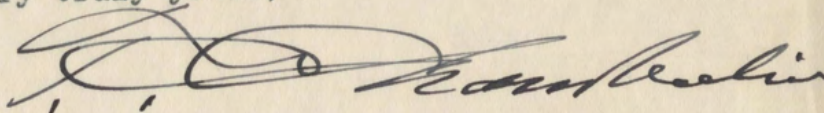
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mechanism of matter is very far-reaching, and will have to be pressed steadily and patiently for a long period. This will require of geological faculties a much greater extension of physical and chemical knowledge than they have inherited, and this will involve supplementary study as well as hard and persistent digging at the roots of things geological. We are already started in that direction and therein have a distinct advantage.

My chief thought in drawing up the scheme in your hands was to re-shape our forces so that our leading men, though still continuing to work along the lines they have already chosen, might shape these so as to work with one another, team fashion, in the very laborious task of reconstructing geological science in ~~some~~ of its basal interpretations. Good team work will triumph in the end, in my judgment, but it will take time and patience as well as good vision and steady courage.

It will be a great pleasure to discuss any and all of these matters to as full an extent as you may wish and your time permit.

Very truly yours,

A handwritten signature in dark ink, appearing to read "R. D. Campbell". The signature is fluid and cursive, with a large, stylized initial "R" and "D".

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Aug. 31, 1922.

PROPOSED REORGANIZATION OF THE DEPARTMENT OF GEOLOGY AND PALEONTOLOGY

CENTRAL IDEA

COURSES REPRESENTING THREE PARALLEL PHASES OF THE EARTH'S EVOLUTION
INSTEAD OF ONE

The Three Central Lines

- I. Culminating phase: The Evolution of Life. Bio-stratigraphy.
Stuart Weller.
- II. *Gradational* (Stratigraphic) phase: The Evolution of the Stratigraphic Record.
Denudation, Deposition
Geo-sedimentation. J Harlen Bretz.
- III. Basal phase: Genesis and Diastrophic Evolution: Geo-genesis
Geo-dynamics. Rollin T. Chamberlin.

Notes:

1. These three courses to constitute the central or trunk lines of the graduate work.
2. The undergraduate work leading up to these to be much as now but modified so as to lead logically into these.
3. Collateral graduate work to be fitted to trunk lines.
 - A. Advanced Mineralogy and Crystallography. (II III)
Daniel Jerome Fisher.
 - B. Advanced Petrology, including generation and differentiation of magmas. (II III) Albert Johannsen.
 - C. Special courses in Vertebrate Paleontology (see (I) note below).
 - D. Advanced courses in Invertebrate Paleontology. (I)
Stuart Weller.
 - E. Economic Geology. (I II III) Edson S. Bastin.
 - F. Metamorphism and other special courses in alternate years (II)

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Note on Vertebrate Paleontology.

Since no acceptable candidate for Vertebrate Paleontology is available at present, let special temporary provision be made for one-quarter courses in

(1) The Evolution of Reptiles and Related Forms, preferably by Case, and

(2) The Evolution of Mammals, preferably by W. D. Matthew. (7)

Let there be two parallel courses given in each of these cases, the one genetic and biological, the other stratigraphic and geographic. Each pair to be given in alternate years, by experts from outside as is now done in case of metamorphism etc.

TEXT BOOKS

Under the will of Dean Salisbury, the University becomes residuary legatee in part to his royalty interests in the textbooks used in the Department. The three-volume work on Geology is already under process of revision by complete re-writing, to bring it up to date and to adapt it to the new aspects of Geology and related sciences. The other textbooks will soon need revision. This recasting gives opportunity for re-shaping the text in working harmony with the three-fold aspects of the proposed work.

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Stuart Weller, Ph.D., Professor of Paleontologic Geology and Chairman of the Department.

Thomas Chrowder Chamberlin, Ph.D., Sc.D., LL.D., Emeritus Professor of Geology.

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Paul MacClintock, Ph.D., Instructor in Geology.

Daniel Jerome Fisher, Ph.D., Instructor in Mineralogy.

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One additional instructor and three assistants.

PROPOSED RECOGNITIONS (in part because of special service during the ~~part~~ year in carrying the work of the late head of the Department during his absence and illness, and in part because of special services and responsibility imposed by this reorganization).

Stuart Weller, made Chairman of the Department with advance of salary.

Rollin Thomas Chamberlin promoted to Professor of Geodynamics and put in active charge of the Journal of Geology.

J Harlen Bretz given special title and put in charge of Prerequisites, with increase of salary.

SPECIAL INSTRUCTORS (SUMMER, 1922)

Ira Shimmin Allison, A.B., Instructor in Geology, University of Minnesota (Summer, 1922).

Daniel Francis Higgins, S.M. (Summer, 1922).

Nelson Sunderland Bastin, Ph.D., Professor of Economic Geology.
 Rollin Thomas Chamberlain, Ph.D., Professor of Geodynamics.
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STATEMENT IN REGARD TO WALKER MUSEUM PREPARED BY PROFESSOR WELLER

When the Departments of Geology and Geography removed to Rosenwald Hall in 1915, Walker Museum was released to be used for the purposes intended by its donor. The building is now being used chiefly for the care of the extensive paleontologic collections belonging to the University, and for the instruction work which is dependent directly upon those collections. When the building was first turned over for museum purposes a program was inaugurated whereby it was expected to gradually install the necessary cases for the care and exhibition of the collections in a manner worthy of the memory of Mr. Walker who so generously donated the building to the University and who so generously agreed to its use, for twenty years, for purposes very different from those for which it was erected.

When the new museum plans were inaugurated it was thought to be wise to provide the new cases in installments, not only because this would permit the expense to be distributed over a term of years, but because of the labor involved in installation of the collections in the cases. The first of the new cases were received in 1916. Then came the war, which interrupted everything, and no request was made for additional cases during the war period. The second lot of cases were erected in 1919, at a considerably advanced cost above those first purchased. Prices kept advancing and we refrained from requesting any further addition for a time, with the hope that costs would diminish.

The time has now come, however, when it seems that a vigorous effort should be made to complete the long delayed furnishing of the Museum in a manner adequate to the gift of Mr. Walker. The collections are all ready to go into the new cases, and many exhibits could be made to be of great value in our instruction work, which are now lying idle and unused. The cases will cost more money now than formerly, but with a continuing annual appropriation of \$3000. for a period of years Walker Museum can gradually be developed into a most important asset in the work of the University.

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Thanks
Budget

The University of Chicago

Acknowledged XXI
March 13 th

March 10, 1923

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President Ernest D. Burton
The University of Chicago

Dear Mr. Burton:

I feel far from being competent to pass on the scientific work of a man in Geology; consequently, I hope you will make due allowances when you read the frank statements which you desire and which I am about to make.

Professor Bastin's work has largely been on the U.S. Geological Survey. In recent years the work of the U.S. Survey seems to have been mostly on problems of immediate economic interest. Professor Bastin's work has been of this type, consequently it is difficult to compare him with such men as Chamberlin, Salisbury, and Williston. My impression is that he does not measure up to these men. Neither do I think he is of the grade of Michelson, E. H. Moore, or Stieglitz. Nevertheless, I think he is scientifically a high grade man.

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A fairly safe means of determining how a scientific man is regarded by his peers in this country is by noting whether or not he is elected to such honorary scientific societies as, The National Academy of Sciences, The American Philosophical Society, and The American Academy of Arts and Science. I do not think Mr. Bastin is a member of any of these societies, and I do not recall that his name has as yet been brought forward by his geological colleagues. It should be stated, however, that he is yet rather young for election to membership in The National Academy of Sciences.

Trusting that what I have written will be of some assistance to you, I am

Very sincerely yours,

F. R. Moulton.

