12 Papers, April 1881

Comm: on School April 1st. 1881 —

1. Report of Comm: consisting of E. S. Philbrick & Mr Carson on raising salaries of the two Instructors in the Shops. —
Not ready yet to Report. —

2. Report of Comm: on Grounds — on the application of 4th year Class for leave to have Lawn Tennis on the Space between Gymnasium & Shops. Philbrick Prof Atkinson & Flint — To be reported on when Mr P. shall have conferred with the Profs.

3. ~~Mention my interview with Mr E. W. Bowditch~~ —

4. Speak of Prof Ware's proposed resignation: & of the future organisation of the Dept —

5 - Ask Prof. Ware to explain his views in person to the Comm. Prof Ware addressed the Comm: on the Subject for more than an hour.

There were present Messrs Flint - E S & J D Philbrick - Mr Paine & Mr Lincoln -

Dr. William Everett thanks Mrs Rogers very sincerely for remembering him in her invitations; but is constrained to reply that his various engagements will not permit of his coming into Boston on Tuesday evening next.

Quincy Mass

2 April 1881.

1901 I.
Washington D.C.
April 6. 1881

Prof. W. B. Rogers
My dear Sir

The Trustees of All Souls Church have again proffered the use of their rooms for the use of the Academy.

A committee of publication was appointed at the session of Nov. last. viz. Messrs. Hilgard, Baird, Gibbs & Agassiz. But as yet there has been nothing to consult about. I hope at the approaching session we may find something.

I supposed from one of your letters that you would soon be here. Prof. Abbe is desirous of bringing Gen Hazen, Chief Signal Officer, into cordial relations to the Academy: & also that the Academy should ~~the Academy~~ should endorse the proposition of the "Am. Metrological Society" for "Standard Time". I have some questions with regard to both, but will yield graciously.

I omitted Prof Silvester's name from the published list of nominees: 1st because our changed Constitution does not provide for vote of absentees for a "foreign associate"; & 2d because such nominations were suspended in April last ~~were suspended~~ until a Committee should report on the Election of Foreign Associates. I do not find that such a Committee was appointed. It may have been without appearing on record.

It may be well for a Committee of the Academy (if you are here you would properly be its head) to wait on President Garfield, notify him of our session & request his presence, & ask for an appointment of a time when the Academy can be received by him. This is in accordance with precedents in cases of an incoming President.

I hope to be able to attend the meeting of the Academy: but Vermont snow storms have sadly demoralized my locomotive machinery.

Very truly yours

J. H. C. Coffin

Prof Coffin Ap. 5,

1107

Washington
April 7. 1881.

Dear Prof Rogers

Referring to your kind letter of last winter. I write now to say that I know of nothing which would withstand my accepting the position of which you wrote me, should the directors of the Inst. see fit to offer it –

Regarding the matter, thus far, as confidential. I have, of course, said nothing respecting it to my colleagues at New Haven or to the governing body of Yale College. I should be unwilling to have announcement made of any action that might be taken, prior to communicating with those to whom I owe so much.

Very truly yours
Francis A. Walker

Prof Wm. B. Rogers, LL.D.
Prest. Mass. Inst. of Technology

From Prof. F A Walker.

117 Marlborough St.
April 7. 1881.

Dear Mr. Slack.

The Institute will be glad to contribute to your exposition. & The "Committee on the Museum" of the Institute, of which Mr. Cobb is the Chairman, has been charged with the care of the subject & will hold a meeting ere long.

Yours faithfully
William B Rogers

Pres. Ch. W. Slack.

X

Brookline April 8th '81

My dear Sir

Mr. Carson & myself, after looking into the case of Foley & Smith, conclude to recommend the payment of $100. per mo. from Apl 1st & they agree to stay a year at that rate.

Yrs truly

E S Philbrick

To Prof W B Rogers
Boston

School of Mines, Columbia College,
Corner 49th Street & 4th Avenue.

New York, April 8th 1881,

Prof. Wm B. Rogers,

Dear Sir:—

The undersigned, having joined in nominating Prof. Thos. Egleston of the School of Mines, Columbia College, for election to the National Academy of Sciences, take the liberty of sending you herewith a list of his published scientific papers, hoping that this record will afford satisfactory evidence of his fitness for membership.

Yours Very Truly,

W. P. Trowbridge
J. S. Newberry
Chas F Chandler

University of Virginia, Va
April 8th 1881

Prof. Wm B. Rogers.

Dear Sir,

I am very much obliged to you for your kind offer to help me with the Smithsonian Institution. More than a month before I wrote to you, I had written to Prof Lesley, asking him if he thought it probable that the Am. Phil. Soc. of Phil^{a}, would publish my memoir. As he did not answer, I had given up expecting to hear from him when I wrote to you. Since I wrote my letter to you, I have at last heard from Prof. Lesley. He says that he thinks it will be only a question of funds with the Phil. Soc., and that if they have the money they will publish my work. As I had written to Prof Lesley first, it is proper that I should first find out whether the Phil Soc. can publish the Memoir or not. As, however, this Soc. has many calls for money, there is some doubt about their ability. It would perhaps be well to find out if the Smithsonian would be willing to publish such a work. In the meantime I am under many obligations to you for your kindness.

Yours truly
Wm M. Fontaine

P.S.
As soon as I get this off my hands, I will take up the Fredericksburg flora, which is rich and very interesting.

Wm. F.

Boston April 8. 1881.

Dear Sir

I write in behalf of the Committee in charge of the School of Drawing and Painting at the Museum of Fine Arts, to ask whether the authorities of the Institute of Technology would be disposed to unite with them in establishing in Boston an Academy, or School of Fine Arts, in which much of the work now in hand can be done to better advantage than by either institution alone. They have learned that some change is to be made in the conduct of the Department of Architecture at the Institute, and have heard it suggested that the Institute might be disposed to give a larger development than it has hitherto done to the practical and scientific side of the subject.

In that case it may not be inopportime to ask whether it cannot be made practicable to divide the work, uniting so much of the instruction in Architecture now given as relates to the fine arts, with the instruction in drawing and painting now given at the Museum, and upon this foundation to erect an independent School of Fine Arts, on a scale, and of a kind, suitable to the importance of the city and to its eminence in the arts.

They believe that if such a combination could be effected, and if the endowment necessary to its maintenance could be secured, that the authorities of the Museum would extend to such an institution the same favor that has already been exercised towards the Drawing School under their charge, and in a larger degree.

The details of such an arrangement would have to be carefully considered. But it may not be premature to suggest that such a School of Fine Arts would have its own professors of Drawing, Painting, Architecture, and so forth, who, with their assistants, would probably be under the supervision of a general director, and that if the authorities of the Museum should accept the care of the funds raised for this purpose and should grant the use of their building and of their collections for its use, these officers would naturally be appointed by the trustees of the Museum, among whom the Institute is already officially represented.

Any course of instruction in Architecture would however almost necessarily embrace many topics not conveniently taught in a school of art, but which would form an essential part of the practical and scientific instruction in architecture still carried on by the Institute. If it should be arranged that the students in Architecture at the Museum should still pursue their studies at the Institute, a half or a third of their fees would be paid into the Institute treasury, while the students of architecture at the Institute, pursuing in the main a more practical course of study, might in turn take a part of their instruction at the Museum.

Each institution would have in charge the work which it was best qualified to perform. For the present, and until the erection of new buildings at the Museum should provide the necessary space for drawing-rooms and lecture-rooms, the new school would probably be glad to occupy a part of the space at the Institute now occupied by the Department of Architecture, paying a suitable rent therefor.

Edw^d Cabot
Chairman

R

117 Marlborough St
April 10. 1881

Dear Mr. Ross.

I am leaving for Mr Cobb, the Chairman of our Museum Comm: a note lately rec^d from Mr. Slack requesting the Institute to make the usual exhibit of Graphical & other work at the~~ir~~ exposition of the Mass. Charitable Mech. Assoc^n. It will be well I think to furnish something to each of the two expositions, as I have said to Mr. Cobb, but of course Mr Augustus Lowell must control the disposition of the contributions from his School of Industrial design.

I have suggested to Mr Cobb to have a meeting of the Committee this month – & regret that I shall not be present. But I shall be glad to aid in any subsequent Conference or action on the subject.

We leave for Washington tomorrow – where I have many preparations to make for the meeting of the Natl Academy of Sciences over which I am expected to preside

With kindest wishes & regard – as ever

yours faithfully
William B Rogers

M. D. Ross Esq.

Wm. B. Rogers
April 10, 1861

X

University of Va
April 11th 1881

My dear Mr Rogers

I am rejoiced to inform you that we have the requisite amount of subscriptions on our list to secure Mr Vanderbilts offer & thereby the Telescope and Astronomical foundation. That is we have the $50.000 on our list with a margin for subscriptions which may have become uncollectable in the long interval in which we have been at work. I got the six names which were necessary to render the five hundred dollar sub=scriptions valid in the last weeks of our work. These names besides yours are

Mrs C. F. Venable $500*
S. W. Venable. $500* (additional to $500 subscribed before by each)*
John W Garrett. Balt $500
Francis White " $500
Enoch Pratt " $500
and yours $500 -

We are collecting now but I have remembered the condition of yours that only one half be paid now & that we wait until later for the balance - Please remember me to Mrs Rogers & tell her that Lelia has the engraving & the photograph & I feel assured she will make an excellent portrait - I shall feel very happy if these additions to our scientific equipment here both of which you have so substantially aided shall serve each year to direct more & more of our brightest young men each year into the fair fields of pure and applied science - I am very proud to tell you that my eldest son now about twenty four years old is Professor of General and applied Chemistry in the University of North Carolina and is doing good work - He studied here with Mallet and afterwards in Germany - With most affectionate respect

Your old pupil
Chas S Venable

Prof W B Rogers LL.D. &c

Naval Observatory,

Washington, D. C., April 19, 1881.

I am requested by Admiral Rodgers to say that he and Mrs. Rodgers will be very happy to see all the Members of the Academy and their families at the Naval Observatory on Wednesday the 20th instant, at at 8 o'clock

The Herdic coaches run regularly to within a short distance of the Observatory, and for a small consideration will take parties to the door. Any one taking the Avenue cars must give direction to be let out at 22nd Street, which ensures good walking to the gate.

(10)

Stated Session held in Washington.
April 19th ~~to~~ 22d 1881.

The meetings were held in All Souls Church
The President, William B. Rogers in the Chair.

The following members (35) were in attendance.

Abbe
Abbot
Baird
Barker
Coffin
Cope
Cooke
Chandler
Ferrel

Gill
Guyot
Hall (Asaph)
Hilgard
Humphreys
Hill
Hunt
King
Langley

Marsh
Meigs
Morse
Newcomb
Peters
Powell
Peirce
Rogers (Wm B)
Rodgers (John)
Rogers (Fairman)

Schott
Scudder
Silliman
Walker
Warren
Wood
Woodward.

Letter from The President ~~Garfield~~ of the U.S.
~~Invitation~~ & Reception.

After a brief welcome from ~~the~~ President Rogers, a letter was laid before the academy from his Excellency President Garfield acknowledging an invitation from the Presdt of the academy ~~Rogers~~ to attend its meetings & expressing the hope that he would be able to do so, & also appointing Thursday evening April 21st as the time for the reception of the Academy at the White House.

(11)

Appointment of a Committee on Meteorology

A communication was laid before the Academy from Genl. William B Hazen Chief Signal Officer U.S.A. under date of April 4th 1881, asking that a permanent committee be appointed with whom the Signal Office might confer from time to time as to the best means of advancing the science of Meteorology & its applications to the benefit of Agriculture & Commerce.

The following named members were thereupon appointed by the President a committee on Meteorology to confer & cooperate with the Chief Signal Officer:

Mr Newcomb Chairman
& Messrs Loomis, Gibbs (W) Newton (H A) Ferrel Schott & Langley.

Messrs Rood & Young were subsequently added to the Committee.

(~~Report of The Home Secretary.~~)

[illegible]

([illegible] Statement. [illegible] Messrs [illegible] 1881).

No 12. & resolutions relating to

[4/19/1881]

(12)

Report of the Home Secretary.

The Home Secretary reported that the only printing done during the year was that of the usual circulars & an appendix to the Pamphlet containing the Constitution & list of Members giving the changes made at the April Session of 1880. All other important proceedings of the Academy in November 1879 & April 1880 appeared in the Annual Report of the President published by Congress in 1880. ~~Seven~~

~~Seventy Books & Pamphlets had been received~~

Seventy Books & Pamphlets had been received.

[4/19/1881]

(12)

Report of Treasurer.

"National Academy of Sciences
April 19th 1881.

The Treasurer reports
the ~~The~~ current account as follows:

Cash balance from past year		1222.19
Dues collected from members during the past year . . .		530.00
		1752.19
Expended for printing	14.10	
" " Stationery	75.75	
" " meetings	111.00	
" " copying	62.50	
	263.35	263.35
Cash balance on hand		1488.84
Due from members		40.00
Total Assets		1528.84

"The trust fund account is as follows:

"The income balance from past year . .		3188.29
"The " receipts for this year. . . .		2397.58
		5585.87
"Expended:		
Appropr. by directors of the Bache fund	500.00	
Safe rent	5.00	505.00
Income balance on hand . . .		5080.87
"In addition to which there "is uninvested capital		43.18
"Total balance in Trust account		$5124.05

[4/19/1881] (14)

No change has been made in the investments.

(Signed) Fairman Ro~~d~~gers,
Treasurer.

Philadelphia, April 17th 1881.

The Committee appointed at the April session 1880, of the National Academy of Sciences, to examine the securities in the hands of the Treasurer report that they have examined the said securities and find that they are "as follows:

United States Loan	5 per cent	$1350.00
United States Loan	5 per cent	2500.00
United States Loan	5 per cent	8100.00
United States Loan	4½ per cent	30050.00
United States Loan	4½ per cent	50.00
United States Loan	4 per cent	3850.00
City of Davenport Loan	6 per cent	1000.00
Philadelphia City Loan	6 per cent	600.00

"Also the deed for 160 acres of Missouri Lands. Also the agreement (one of four) made with the Pennsylvania Company for Insurance on Lives and Granting Annuities, as to the use and final disposition of the Joseph Henry Fund of $40,000.

[4/19/1881]

Also a receipt from J. E. Hilgard for the deeds for part of lot No 6 Square 120, which property is to pass into the hands of the heirs of Professor A. D. Bache. Nine Documents.

(Signed) John L. Le Conte.

On motion of Mr Hilgard Messrs Morse and Schott were appointed a Committee to audit the Treasurer's accounts.

The report of the Auditing Committee on the Treasurer's accounts for the fiscal year ending April 19th 1881 was read & approved.

Stated Business.

Mr Hilgard made the following statement in regard to the Academy property in Washington and presented ~~a~~ the following resolution in regard to the same recommended by the Council, which was adopted.

[4/19/1881] (16) #7

[illegible] relating to Prof. Hilgard's statement.

District of Columbia
City of Washington

At an annual meeting of the National Academy of Sciences held in the city of Washington at All Soul's Church, it was, on the 19th day of April 1881

Resolved, that the rear part of lot 7 in square numbered 120 in the City of Washington in the District of Columbia as deeded to Joseph Henry, Benjamin Peirce and James D. Dana or the survivor or survivors of them to be held in trust for the benefit of the National Academy of Sciences by indenture of date the third day of March A.D. 1874 and duly recorded in Liber numbered 744, folio 153 et. seq. one of the Land Record Books of the said District of Columbia be sold unto Seaton Schroeder of the United States Navy for the sum of one thousand dollars cash.

And it is further Resolved that James D. Dana, surviving Trustee named in said indenture of March 3rd. 1874 be and he is

hereby authorized and directed to convey the said part of said lot unto the said Seaton Schroeder by a good and sufficient deed in fee simple".

In testimony whereof, I, Wm B. Rogers, President of The National Academy of Sciences have hereunto set my hand and affixed the seal of the said Academy on this 17th day of April, A.D. 1881.

(Signed) Wm B. Rogers
President of the National
Academy of Sciences.

L.S.

~~Mr Newcomb made the following~~ Statement in regard to the bequest of the late Professor Watson: by Mr Newcomb –

[4/19/1881]

(18)

It is known to members of the Academy that our late lamented colleague Professor James C. Watson has bequeathed all his estate after satisfying certain claims and paying certain annuities to relatives to the National Academy of Sciences in trust for the promotion of astronomical researches. Having been named one of the executors I took occasion during a journey to Madison last January to inform myself of the condition of the estate and the probable benefits to be derived from it. I find that although almost the entire property was in the State of Michigan yet as he was a resident of Wisconsin at the time of his death and as his estate was entirely personal the Courts of the latter had exclusive jurisdiction of the bequest.

As none of the executors named in the will are residents in Wisconsin and as they are widely scattered it will be difficult for more than one to act and the administration will have to be conducted under the direction of the Probate Court at Madison.

It is difficult to see what amount if any the Academy will ultimately receive for the purposes desired by the testator owing to two causes. The unsettled condition of several business enterprises in which our colleague had invested much of his means and the indefinite character of his business arrangements with the university of Wisconsin. The only items of the estate to which even an approximate cash value can be assigned consists of stock

and policy in the Mutual Life Insurance Company of Michigan the total value of which probably amounts to about $30,000.

The next item in importance is the Printing and Publishing Company of Ann Arbor, of which the deceased owned 499 shares out of the total of 500. The actual cost of this stock was about $26000. but the property at present owned by the Company is of so miscellaneous a character and it is so complicated by litigation as to make it hardly possible even to guess at the value of its assets.

I judge however from a general examination of its property that should the company go into liquidation it might realize anywhere~~s~~ from $5000 to $15000 but a debt of $5000 is due from it so that the net amount may ~~a~~range from zero to $10000 the lower ultimate being the more probable than the upper one. The next item in importance is the Chase Publishing Company of Toledo which is said to be profitable but to it no definite value can be assigned.

On the other hand our colleague at Madison expended considerable sums on improvements of the Observatory and its grounds without any distinct understanding with the Board of Regents as to who should ultimately bear the expense. These improvements include the Watson solar observatory, the students observatory, the fitting up of the Director's house, the purchase of the transit instrument and several other items. An amount

of between $5000 and $10000 is I believe due on these various improvements so that if the estate is to pay for them all it will be materially diminished.

I may also add that under the laws of Wisconsin Mrs Watson is entitled in lieu of the provision made for her in the will to accept one third of the net proceeds of the estate. It has been suggested that in the event of the estate not realizing the amount expected an arrangement should be made with Mrs Watson to allow her the entire income from it during her life on condition of the entire amount reverting to the Academy on her death. This arrangement will probably commend itself if the amount shall be found insufficient to carry out the objects which our lamented colleague had at heart in making the bequest.

Univ. of Va.
April 19. 1881

My dear Sir

A few days ago I received a kind note from Prof. W. Gibbs inviting me to be present during the meeting of the Nat. Acad. of Sciences which begins today — I hope to go on to Washington tomorrow night, and to have an opportunity of hearing some at least of the proceedings — I have some interesting results, just obtained, with regard to the molecular weight of hydro:fluoric acid, which I should be glad to lay before the Academy. As I have to go on to Baltimore on business connected with an investigation I am carrying out for the National Board of Health, it would suit me best, if according with the general arrangements of the Academy, to bring forward my little paper, which will not take more than about a quarter of an hour, on Thursday afternoon.

Looking forward with pleasure to seeing you and Mrs Rogers again and hoping for an opportunity to talk with you a little about our soon to be appointed astronomer,

I am, dear Sir,
Very truly yours,
J. W. Mallet

Prof. Wm. B. Rogers—
Presdt. Nat. Acad. of Sciences.

Prof. J. W. Mallet

NATIONAL ACADEMY OF SCIENCES,

1881.

Papers registered, Tuesday, April 19.

1\. On the domain of physiology.—J. Sterry Hunt.
12 minutes.

2\. The compass plant of the Western prairie.—B. Alvord.
15 minutes.

3\. The solar constant.—S. P. Langley.
20 minutes.

4\. The color of the sun.—S. P. Langley.
30 minutes.

5\. On mountain observations.—S. P. Langley.
10 minutes.

6\. On the relation of soils to health.—R. Pumpelly.

7\. Reduction to sea-level of barometric observations made at elevated stations.—Elias Loomis.

Members coming in after roll-call are requested to report to the Secretary.

NATIONAL ACADEMY OF SCIENCES,

1881.

Papers registered for Wednesday, April 20, and following days.

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5. On mountain observations.—S. P. LANGLEY.
10 minutes.

6. On the relation of soils to health.—R. PUMPELLY.

7. Reduction to sea-level of barometric observations made at elevated stations. – ELIAS LOOMIS.

8. On electric light photometry.—GEO. F. BARKER.
10 minutes.

9. On the condenser method of measuring high tension currents.—GEO. F. BARKER.
15 minutes.

10. On the carbon lamp fiber in the thermo balance.—GEO. F. BARKER.
10 minutes.

11. On the relation between strains and impacts and the structures of the feet of mammalia. –E. D. COPE.
20 minutes.

12. On the progress of pendulum work.—C. S. PEIRCE.
20 minutes.

13. Upon the production of sound by radiant energy.—A. GRAHAM BELL.
30 minutes.

14. On the later tertiary of the Gulf of Mexico.—E. W. HILGARD.

15. Recent researches in the vicinity of Behring's Strait, comprising—

I. An account of the land-ice of Kotzebue Sound and the Arctic Coast.
20 minutes.

II. Additions to our knowledge of the currents and temperature of the ocean in the vicinity of Behring's Strait.—W. H. DALL.
20 minutes.

16. A method for finding the proximities of the orbits of minor planets.—C. H. F. PETERS.
20 minutes.

17. Structure of the wings of insects, studied palæontologically.—SAM'L H. SCUDDER.
15 minutes.

18. Biographical memoir of S. S. Haldeman.—J. P. LESLEY.
(Appointed to be read on Thursday, at 3 P. M.)

Members coming in after roll-call are requested to report to the Secretary.

X

University of Virginia
April 23 1881

My dear Mr Rogers

Your kind letter of April 21 with check for two hundred and fifty dollars for Observatory endowment fund was received this morning. Many thanks for your great kindness to us throughout this undertaking in behalf of all my colleagues and your friends. I hope my friend Prof Mallet will see you in Washington. He promised to see you and talk with you *confidentially* with regard to some good name for the position of Observer among the scientific astronomers of the North. While of course

X

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
WASHINGTON.

April 28. 1881.

Dear Prof Rogers.

Permit me to introduce Mr. Goodfellow - of the Coast Survey Office, as a gentleman most worthy, on both personal and scientific grounds, of your confidence -

Mr Goodfellow desires to bring to your attention a matter vitally affecting the Coast Survey service.

So far as I understand the matter, the integrity & usefulness of that service are threatened by certain Martinet regulations conceived in the spirit which is very apt to actuate military & naval officers in dealing with civilian men of science —

However seems to be an infinite pity that at the very moment when the usefulness of the Signal office seems certain to be greatly increased by the willingness & even the desire of the military head to defer to scientific men, the usefulness of the Coast Survey should be threatened by increasing narrowness & prejudice, on the part of its chief, in dealing with the civilian officers of that Bureau —

With great respect
F. A. Walker

Prof Wm B. Rogers. LL.D

War Department
Office of the Chief Signal Officer.

Washington, D.C. April 29th 1881.

Prof. W. B. Rogers,
President of the National Academy of Science,
(Through Prof. J. H. C. Coffin, Secretary &c,
Washington, D.C.)

Sir:

I have the honor to acknowledge the receipt of your letter of the 22d inst., informing me of the appointment, on the part of the National Academy of Science, of a committee of conference on "Meteorological Science and its applications".

I beg you to inform the chairman that I shall be pleased to meet this committee whenever questions arise requiring its consideration, or to receive at any time from it, any suggestions as to methods by which we may successfully

successfully coöperate in the advancement of Meteorology.

I am, very respectfully,
Your obedient servant,
W.B. Hazen
Brig. & Bvt. Maj. Genl.,
Chief Signal Officer, U.S.A.

From Genl. Hazen
acknow^{g} – my appoint^{t}
of Comm of Academy
Ap. 25. 1881

Cambridge, April 30, 1881.

Dear Professor Rogers,

I went to Boston with Charles, this afternoon to call on you and Mrs. Rogers, and to ask you if you would come and see our Greek Play which is to be performed in the Sanders Theatre in the third week in May. You may have heard that we propose to have the Oedipus Tyrannus of Sophocles performed in Greek here; and I trust you and Mrs. Rogers will be interested enough in so novel a dramatic performance to come and see and hear it.

We shall prefer to have you come on the opening night, Tuesday, May 17; but if either Thursday or Friday night (May 19 or 20) or Saturday afternoon (May 21), will be more convenient to you, I can send you tickets for any of these.

If you will let me know which performance you prefer to attend, I will send you tickets with the greatest pleasure.

As no one answered your door bell this afternoon, I thought you must still be absent from town. I did not call last week because I knew that you were in Washington.

Hoping that you will be able to come. I remain with greatest respect,

very truly yours,

W. W. Goodwin.

Professor Rogers.

MASSACHUSETTS INSTITUTE
OF TECHNOLOGY.

Boston, April 30 1881

My dear Professor Rogers

The case of Mr Frank D. Chase, a very worthy student and Excellent Schol~~l~~ar who has had a very hard time to make the two Ends meet pecuniarily during his Course, and who is just now about to graduate, was referred to You by the Faculty. Hoping that if there was any thing on hand belonging to the Forbes Schol~~l~~arship fund that it might be appropriated to aid in this Case. And that if there was nothing on hand of that fund that the Corporation would accept his note in the place of payment at this time

Very Respectfully Yrs

Robert H. Richards
Secretary.

CONFIDENTIAL.

NATIONAL ACADEMY OF SCIENCES.

NOMINATIONS

Made at the April Session, 1881, to be voted on at the April Session, 1882.

Absent members may inscribe on a ballot the names of nominees, not exceeding five in number, and send it to the Home Secretary, Navy Department, Washington, D. C., by the day of meeting.

A. GRAHAM BELL.

? Proposed by—S. P. Langley, Simon Newcomb,
J. W. Powell, Geo. F. Barker.
Josiah P. Cooke.

DR. W. K. BROOKS,* Johns Hopkins University, Baltimore, Md.

Proposed by—Theo. Gill, Edw. D. Cope,
Edw. S. Morse, Sam'l H. Scudder,
S. F. Baird.

PROF. CHAS. A. GOESSMAN, Agric'l College, Amherst, Mass.

Proposed by—C. F. Chandler, T. Sterry Hunt,
Geo. F. Barker, E. W. Hilgard,
Benj. Silliman.

WM. HENRY DALL, Coast and Geodetic Survey, Washington, D. C.

Proposed by—J. E. Hilgard, Wm. Ferrel,
Theo. Gill, S. F. Baird,
Cleveland Abbe, Asaph Hall,
Chas. A. Schott.

PROF. EDWARD S. DANA,* New Haven, Conn.

Proposed by—Josiah P. Cook, R. Pumpelly,
O. C. Marsh, Benj. Silliman,
Francis A. Walker, Clarence King.

Prof. Thomas Egleston,* School of Mines, Columbia College, New York.

Proposed by—C. F. Chandler, F. A. P. Barnard,
J. S. Newberry, T. Sterry Hunt,
W. P. Trowbridge.

Daniel Cady Eaton, Professor of Botany, Yale College, New Haven, Conn.

Proposed by—S. F. Baird, H. C. Wood,
Theo. Gill, O. C. Marsh,
Sam'l H. Scudder, Benj. Silliman.

+ **Prof. Wm. Harkness,* Naval Observatory, Washington, D. C.**

Proposed by—John Rodgers, Asaph Hall,
J. H. C. Coffin, M. C. Meigs,
Cleveland Abbe, S. P. Langley.

Prof. Henry B. Hill, Cambridge, Mass.

Proposed by—Wolcott Gibbs, Geo. F. Barker,
Josiah P. Cooke, R. Pumpelly,
C. F. Chandler.

Prof. J. W. Mallet, University of Virginia.

Proposed by—G. F. Barker, Benj. Silliman,
C. F. Chandler, Josiah P. Cooke,
T. Sterry Hunt.

? **Frederick W. Putnam, Cambridge, Mass.**

Proposed by—J. W. Powell, Geo. F. Barker,
S. P. Langley, S. F. Baird,
Edw. S. Morse.

Prof. Chas. L. Jackson, Cambridge, Mass.

Proposed by—T. Sterry Hunt, Geo. F. Barker.
Josiah P. Cooke, R. Pumpelly,
C. F. Chandler, Wolcott Gibbs.

? **Chas. V. Riley, President U. S. Entomological Commission, Washington, D. C.**

Proposed by—Theo. Gill, T. Sterry Hunt.
Edw. S. Morse, J. W. Powell,
S. F. Baird.

Prof. Ira Remsen, Johns Hopkins University, Baltimore, Md.

Proposed by—Geo. F. Barker, Josiah P. Cooke,
C. F. Chandler, T. Sterry Hunt,
Benj. Silliman, Wolcott Gibbs.

Prof. J. J. Sylvester, Johns Hopkins University, Baltimore, Md.

Proposed by—S. Newcomb, Wm. Ferrel,
Asaph Hall. C. S. Peirce,
Geo. W. Hill.

Prof. Theo. G. Wormley,

Proposed by—Benj. Silliman, Geo. F. Barker.
H. C. Wood, J. J. Woodward,
C. F. Chandler.

+ **Prof. Nathaniel S. Shaler, Harvard College, Cambridge, Mass.**

Proposed by—R. Pumpelly, Clarence King,
T. Sterry Hunt, Sam'l H. Scudder,
J. W. Powell.

Sidney J. Smith,* New Haven, Conn.

Proposed by—Geo. F. Barker, O. C. Marsh,
S. F. Baird, F. A. Walker,
G. J. Brush, Sam'l H. Scudder.

Note.—The lists of published works of nominees marked with a * are in the hands of the Home Secretary. These, however, in some cases, extend only to early in 1879.

Nominations not acted on favorably are dropped unless renewed.

SIMON NEWCOMB,
Home Secretary.

Navy Department, Washington, D. C.,
March 18, 1882.

CONFIDENTIAL.

NATIONAL ACADEMY OF SCIENCES.

NOMINATIONS

Made at the April Session, 1881, to be voted on at the April Session, 1882.

Absent members may inscribe on a ballot the names of nominees, not exceeding five in number, and send it to the Home Secretary, Navy Department, Washington, D. C., by the day of meeting.

A. GRAHAM BELL.

Proposed by—S. P. Langley, Simon Newcomb,
J. W. Powell, Geo. F. Barker,
Josiah P. Cooke.

DR. W. K. BROOKS,* Johns Hopkins University, Baltimore, Md.

Proposed by—Theo. Gill, Edw. D. Cope,
Edw. S. Morse, Sam'l H. Scudder,
S. F. Baird.

PROF. CHAS. A. GOESSMAN, Agric'l College, Amherst, Mass.

Proposed by—C. F. Chandler, T. Sterry Hunt,
Geo. F. Barker, E. W. Hilgard,
Benj. Silliman.

WM. HENRY DALL, Coast and Geodetic Survey, Washington, D. C.

Proposed by—J. E. Hilgard, Wm. Ferrel,
Theo. Gill, S. F. Baird,
Cleveland Abbe, Asaph Hall,
Chas. A. Schott.

PROF. EDWARD S. DANA,* New Haven, Conn.

Proposed by—Josiah P. Cook, R. Pumpelly,
O. C. Marsh, Benj. Silliman,
Francis A. Walker, Clarence King.

PROF. THOMAS EGLESTON,* School of Mines, Columbia College, New York.

Proposed by—C. F. Chandler, F. A. P. Barnard,
J. S. Newberry, T. Sterry Hunt,
W. P. Trowbridge.

DANIEL CADY EATON, Professor of Botany, Yale College, New Haven, Conn.

Proposed by—S. F. Baird, H. C. Wood,
Theo. Gill, O. C. Marsh,
Sam'l H. Scudder, Benj. Silliman.

PROF. WM. HARKNESS,* Naval Observatory, Washington, D. C.

Proposed by—John Rodgers, Asaph Hall,
J. H. C. Coffin, M. C. Meigs,
Cleveland Abbe, S. P. Langley.

PROF. HENRY B. HILL, Cambridge, Mass.

Proposed by—Wolcott Gibbs, Geo. F. Barker,
Josiah P. Cooke, R. Pumpelly,
C. F. Chandler.

PROF. J. W. MALLET, University of Virginia.

Proposed by—G. F. Barker, Benj. Silliman,
C. F. Chandler, Josiah P. Cooke,
T. Sterry Hunt.

FREDERICK W. PUTNAM, Cambridge, Mass.

Proposed by—J. W. Powell, Geo. F. Barker,
S. P. Langley, S. F. Baird,
Edw. S. Morse.

PROF. CHAS. L. JACKSON, Cambridge, Mass.

Proposed by—T. Sterry Hunt, Geo. F. Barker.
Josiah P. Cooke, R. Pumpelly,
C. F. Chandler, Wolcott Gibbs.

CHAS. V. RILEY, President U. S. Entomological Commission, Washington, D. C.

Proposed by—Theo. Gill, T. Sterry Hunt.
Edw. S. Morse, J. W. Powell,
S. F. Baird.

PROF. IRA REMSEN, Johns Hopkins University, Baltimore, Md.

Proposed by—Geo. F. Barker, Josiah P. Cooke,
C. F. Chandler, T. Sterry Hunt,
Benj. Silliman, Wolcott Gibbs.

PROF. J. J. SYLVESTER, Johns Hopkins University, Baltimore, Md.

Proposed by—S. Newcomb, Wm. Ferrel,
Asaph Hall. C. S. Peirce,
Geo. W. Hill.

PROF. THEO. G. WORMLEY,

Proposed by—Benj. Silliman, Geo. F. Barker.
H. C. Wood, J. J. Woodward,
C. F. Chandler.

PROF. NATHANIEL S. SHALER, Harvard College, Cambridge, Mass.

Proposed by—R. Pumpelly, Clarence King,
T. Sterry Hunt, Sam'l H. Scudder,
J. W. Powell.

SIDNEY J. SMITH,* New Haven, Conn.

Proposed by—Geo. F. Barker, O. C. Marsh,
S. F. Baird, F. A. Walker,
G. J. Brush, Sam'l H. Scudder.

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Nominations not acted on favorably are dropped unless renewed.

SIMON NEWCOMB,
Home Secretary.

NAVY DEPARTMENT, WASHINGTON, D. C.,
March 18, 1882.

While April 1881 –
~~During~~ the reading of the
papers was in progress on ~~the~~ last day
~~of the~~ session ~~the~~ Prest:
Garfield entered the room
& ~~at the~~ invitation of the
Prest: of the academy
occupied
~~to take~~ a seat on the
platform, where he
remained till ~~the~~ close of
the meeting.

[J. E. Hilgard, Apr. 1881]

5

Restoration of Independence Manuscript.

In May 1880, the following communication was received from the Secretary of the Interior in behalf of the Commission appointed by Congress in August 1876 to take measures for restoring the writing of the Declaration of Independence and appended signatures:

"Department of the Interior
Washington, May 6, 1880.

Prof. William B. Rogers;
President of the National Academy of Sciences
Boston, Mass..

Sir:

By joint resolution of Congress, approved August 3, 1876, the Secretary of the Interior, the Secretary of the Smithsonian Institution, and the Librarian of Congress, were constituted a commission empowered to take measures to restore the writing of the Declaration of Independence and the signatures

[J.E. Hilgard, Apr. 1881]

nded thereto. In compliance with the direction of the Commission I have the honor to submit for your consideration the following resolution passed at a meeting held at the Department of the Interior on the 5th instant:

"That the Secretary of the
"Interior, Chairman of the Commission,
"present the question of restoration
"of the faded writing of the
"original manuscript of the Decla-
"ration of Independence to the
"President of the National Academy
"of Sciences, Professor William B.
"Rogers, of Boston, with the request
"to appoint a committee of Ex-
"perts, from the members of the
"Academy, to take the subject
"into consideration, and to
"report whether such restoration

[J. E. Hilgard, Apr. 1881]

"be expedient or practicable, and
"if so, in what way the object
"can best be accomplished."

(Signed) C. Schurz
Secretary of the Interior
and Chairman of the Commission

In conformity with the request of the Commission, I appointed the following named ~~gentlemen as~~ members of the Academy a committee to consider and report upon the subject:

Wolcott Gibbs, Chairman.
J. E. Hilgard
J. Lawrence Smith
R. E. Rogers
C. F. Chandler.

After a full consideration of the questions involved, this committee made the subjoined report, which was forthwith transmitted to the Secretary of the Interior.

[J. E. Hilgard, Apr. 1881]

Report of the Committee of the National Academy of Sciences on the restoration of the Manuscript of the Declaration of Independence.

"Prof. Wm B. Rogers;
President of the National Academy of Sciences.

Sir: The Committee of the National Academy of Sciences to which was referred the question of restoration of the faded writing of the original manuscript of the Declaration of Independence respectfully reports:

That in the judgment of the Committee it is not Expedient to attempt to restore the manuscript by chemical means, partly because such methods of restoration are at best imperfect and uncertain in their results, and partly because the committee believes that the

[J.E. Hilgard, Apr. 1881]

injury to the document in question, is due, not merely to the fading of the ink employed, but also and in a large measure, to the fact that press copies have been taken from the original, so that a part of the ink has been removed from the parchment.

Your committee is therefore of opinion that it will be best either to cover the present receptacle of the manuscript with an opaque lid, or to remove the manuscript from its frame, and place it in a portfolio, where it may be protected from the action of light, and furthermore that no press-copies of any part of it should in future be permitted."

[J. E. Hilgard, Apr. 1881]

Wolcott Gibbs, Chairman.
J. E. Hilgard.
J. Lawrence Smith
R. E. Rogers.
C. F. Chandler.

Deaths of Members.

Since the Meeting of the Academy in April last, we have been called upon to mourn the loss of four of our members by death: Mr. Jonathan Homer Lane; Count L. F. Pourtales; Prof. S. S. Haldeman; and Prof. Jas. C. Watson. Professors J. E. Hilgard; Alexander Agassiz; J. P. Lesley; and Simon Newcomb have been appointed to prepare biographical memoirs of the deceased in the order above named. The number of members of the Academy has thus been reduced from 100 to 96.

[J. E. Hilgard, Apr. 1881]

Permanent Committee on Meteorology to Coöperate with the Chief Signal Officer.

In a letter ~~received~~ dated April 4, 1881, Genl. Wm. B. Hazen, Chief Signal Officer requested the appointment by the President of the Academy of a permanent committee of its members, with whom he might ~~advise~~ confer on questions of scientific and practical meteorology. On consultation with the Council, I have appointed the following named members:

Annual Report
Ap. 1881

[Apr. 1881]

Notes of Address.

Words of Welcome and Short reference to the loss which the Academy has suffered by the death of four of its members —

The well known mathematician and astronomer Lane; the zealous zoölogist and hydrographer Pourtales; the naturalist and philologist Haldeman; and the astronomer Watson.

Brief Review of Scientific Progress during the past Year.

In asking the permission of the Academy to a brief retrospect of some a few of the steps of scientific progress which have marked the past year, I shall occupy but little of their time and limit my view chiefly to the department of Physical Science, reserving the great fields of Natural History and Geology perhaps for remarks on some future occasion.

[April 1881]

Astronomy.

In Astronomy we may signalize the addition of ten small planets, of which two have been discovered by Professor Peters, thus bringing the number of the rapidly increasing group of Asteroids to 220.

Taking advantage of the favorable position of Mars, Professor Young of Princeton, has made a new determination of the relation between the polar and equatorial diameter of that planet, giving a value for the compression of $\frac{1}{23.6}$ instead of $\frac{1}{26}$ to $\frac{1}{36}$ as previously accepted.

At the same time, Professor Asaph Hall has ascertained with greater precision than was before attainable the times of revolution of the two Satellites of Mars of which he was the discoverer.

Within the period under consideration Professor H. Draper has been successful in obtaining an

[April 1881]

instructive photograph of the Nebula in Orion; an account of which was I believe ~~as~~ communicated to the Academy at its November meeting.

I should here also refer to the recent ~~later~~ labors of Professor Pickering of Cambridge, in Star Photometry by the use of ingenious, and in many respects original instruments and methods, leading to an estimation by photometric values of the diameters of the Satellites of Mars, Saturn, Uranus, and Neptune, as well as of several of the Asteroids. Professor Pickering is also successfully occupied in applying photometric measures in the comparison of Stars; and especially in the determination of the periodical variations of light in Variable Stars of short period.

[April 1881]

Relations of Pressure, Temperature, and Volume in Gases and Vapors.

The laws of Marriotte and Charles so long accepted as fundamental, have, as all know, been shown of late years to be true only within a limited range, varying with the several gases experimented on, so that $p \times v$ the product of pressure and volume can no longer be assumed as constant, even at considerable distances above the critical point; and if the law of Avogadro is to be considered as essentially dependent on this constancy, it must be regarded as becoming more and more questionable.

Among the important additions to our knowledge of the varying coefficients of dilatation and of compressibility of gases under very strong pressures, are the results obtained

[April 1881]

by Amagat at St. Etienne, who availing himself of a deep mine shaft, secured command of a mercurial column 380 metres, (upwards of 1200 feet) high, equivalent to 431 atmospheres. These experiments made at temperatures of 18° to 22°, have enabled him to compare O. N. air. C.O. Methene, Ethylene &c, at these temperatures, under pressures varying from 28 to 431 atmospheres, and he has found, as recently announced, that within this range the product $p\,v$ first diminishes and then increases as the pressure (p) is increased. In the case of Ethylene, beginning with a pressure 31.78 and increasing p to 84.16 atmos., the product pv falls from $2\frac{1}{3}$ to 1, and increasing p to 398.71 the product rises from 1 to 3.13. Nitrogen at $430\frac{3}{4}$ atmos. had volume only $\frac{3}{4}$ of amount required by Marriotte's law. Amagat

[April 1881]

found, as might be expected, that the expansion by heat as we approach the critical temperature first increases, and then diminishes indefinitely. Carbonic Acid under pressure of 110 atmos., when heated from 40° to 60° had its **volume** doubled.

These interesting experimental results have been somewhat anticipated by VanderWaal & Clausius, as has been stated, on theoretical grounds, and able discussions relating to the subject are given in a recent paper on Vapor Densities, by Professor J. W. Gibbs.

[April 1881]

Hannah's Experiments.

Connected with these investigations, we should note Professor Hannah's late very curious experiments giving further evidence of the continuity of the gaseous and liquid states.

Starting from the early experiment of Cagniard Latour, Professor Andrews of Belfast as is well known by his masterly researches showed clearly the insensible transition from the one of these conditions to the other at the critical temperature, but Professor Hannah has given further proof of this continuity, by demonstrating the solubility of solids in gases under great pressure, and at temperatures much above the critical point. Thus alcohol gas under strong pressure even at 100°C above its critical temperature point, retained in solution the Potass. Iodide which had been dissolved in it while a liquid. The same is true with other

[April 1881]

substances including Chloride of Cobalt, and what is specially interesting, these solids dissolved in the gas, especially the last named, as also a preparation of Chlorophyl, gave the same absorption spectra as in the ordinary liquid solution.

One of the most striking, and I may add, unexpected results of investigations in this line of inquiry has recently been brought to light by Dr. Carneally in his so called experiment of "Hot Ice", in which by a continuous exhaustion, which removed from a mass of ice enclosed in his apparatus, every vestige of vapor as fast as it could be formed, he was able to heat the walls of the vessel in contact with the ice, to a high temperature without causing it to melt, so that while the ice was observed slowly to waste away like a mass of camphor in the air, it passed from the solid to the gaseous state without passing through the intermediate liquid condition.

[April 1881]

Besides this, the thermometer imbedded in the Ice, formed around it, at the beginning of the experiment, ~~w~~ rose to a high temperature, corresponding to that of the enclosing tube heated by a Bunsen burner, but did not melt the Ice in contact with it.

Although the evidence is strong that the therm: indicated the real temperature of the Ice ~~also~~, a reliable determination _calorimetrically_ seems to be needed to set the question at rest.

One might perhaps imagine that in these conditions the evaporation from the free surface of the Ice would, with such a complete removal of vapour pressure, carry off the minutest film of liquid, _in the instant of its formation_, while the absence of all bubbles or vacuities in the Ice leaves no opportunity for an interior melting & disintegration & something of this kind has indeed been suggested as explan^{n} of the phenomenon

Relations of Light, Electricity & Magnetism

Among the most recent discoveries in _Electro-optics_ or the relations of Light, Electricity & Magnetism, should be mentioned the results obtained experimentally by Kerr, Henri Becquerel~~le~~, Kundt & others. Prof^{r} Kerr, having exposed various Dielectrics, such as Carbon-di-Sulphide in a flat Cell with glass sides, to powerful Electric Stress, by connecting the opposite surfaces with the poles of a Holtz machine,

[April 1881]

found that a beam of light, in passing through the cell suffered double refraction & that the amount of this change was in direct proportion to the Electric tension due to the charge, & he has more lately extended his experiments ~~them result~~ to opaque bodies & has shown that a plate of Magnatised iron, sufficiently thin to transmit some light, has the power of rotating the plane of polarization of the incident ray.

Henri Becquerel, in his recent experiments on the rotary polarization induced in gasses by magnetic stress, has added largely to our knowledge of Magneto-optics.

The startling discovery of Faraday, ~~that~~ which has so long furnished a subject of interest in the Physical Laboratory, namely; the change of the plane of ~~production rotary~~ polarization ~~of~~ induced in a beam of light when transmitted through heavy glass under strong magnetic stress, ~~has been~~ was the starting point of successive discoveries in the comparatively new department of Magneto-optics to which Becquerel has recently made such important contributions. Using a copper tube closed at the ends with glass as the receptacle of the various gasses to be experimented on, he Becquerel placed it so as to form the core of an electro-magnet, transmitting the beam of light through the cylinder ~~of~~ longitudinally, ~~he~~ found of course that it suffered no change ~~of course~~ in its transmission, as long as the electro-magnet remained unexcited.

but the moment that the magnetic tension was brought into play, the beam was subjected to a change the same in kind as that observed by Faraday in the case of heavy glass & by him & others in several solids & liquids. Nitrogen & its Oxide, Carbonic Acid, Ethylene & Oxygen &c were successively tried, & in all cases rotation of the polarization was the result. Comparing the effect of the magnetic strain on the different colored rays, he found that with the exception of oxygen the rotation of the plane of polarization was nearly proportional to the inverse square of the wave length as in the case ~~of [illegible]~~ of ~~non~~magnetic solids & liquids

It may be added that Kundt & Roentgen have recently shown, as might perhaps have been expected, that atmospheric air produces a like effect; & ~~they have~~ ~~made it probable~~ have added to Becquerel's inference from observation that the earths magnetism exerts an influence on the direction of the plarization of light passing through the atmoshere

(*. Insert on preceding page) We should not omit to mention in this place as ~~seemingly~~ connected with the agency of magneto-electric tension, the very remarkable discovery of Mr Hall of the same University of a new action of magnetism on in Electric currents, which has been so happily summarised by Profr Rowland, in this form namely: "Whenever a substance transmitting an electric current is placed in a magnetic field, besides the ordinary electro-motive force in the medium, we now have another acting at right angles to the current & to the magnetic lines of force."

(Insert paragraph from page 12,)

Electro-Magnetic Theory of Light.

[April 1881]

The Electro-Magnetic theory of Light due ~~wh~~ chiefly, if not wholly, to the subtle & profound genius of the late Professor Clerk Maxwell, & which many distinguished Mathematicians & Physicists are we believe inclined to accept has direct relation to the facts of magneto-electric tension which have been referred to, & while perhaps explanatory of them would seem to be fortified by other recent researches & experiments.

According to this view Light is to be regarded as an Electro-Magnetic disturbance, an Electric vibration rather than a material one. ~~It is a~~

It is a deeply interesting fact that the rate of propagation of an Electro-Magnetic wave, as computed, turns out to be the same as the velocity of light, & not ~~long since~~ that recently Profr Rowland of Johns Hopkins University by very delicate measures of the ratio of the electro-magnetic to the electro-static units of Electricity, ~~observations have found experimental evidence that these quantities are identical~~ that this ratio is almost exactly ~~the vel. of~~ the velocity of Light,

Adopting ~~the~~ Maxwell's Theory, Thompson of Cambridge Engd, has very lately investigated the effect on the velocity of Light in a Dielectric, caused by the motion of the latter, & finds that it is increased by $\frac{1}{2}$ the velocity with which the Dielectric is moved, & this is precisely the result of Fizeau's expt. of the displacement of the Interference-fringes in such a case.

Recent discoveries in Connection with Heat

In the measurement of Temperature nothing so important I think has been lately achieved as Prof. Langley's ingenious & exquisitely delicate or actinic thermal balance, in which by an arrangement of very thin parallel ribbons of metal ~~in connection~~ traversed by electric currents, he has been able by the disturbance of their balanced action, through the impulse of heat rays on one of them, to indicate a difference of temperature as small as the $\frac{1}{50000}$ of 1° Fahrenheit.

Investigations & Applications of the Principle of the Photophone

1. Mercadier's researches. Radiophone
Thermophone

2. Tyndal's application to the comparason of Diathermancy of gasses & vapors. (At the same moment almost Lecher attempts to confirm Magnus)

3. Roentgen's experiments on the same.

4. Graham Bell's brilliant further application to the ~~luminous~~ acoustic exploration of the Spectrum. an account of which is promised to the Academy during our session.

Recent progress of Molecular Physics & Chemistry

1. Crafts & Meier have lately shown that variations of density of Iodine vapor, with temp: & press: correspond to a progressive dissociation from the molecule I_2 at low temperature to I at high.

2. Julius Thomson's Thermo-Chemical investigations of the molecular structure of the Hydro-Carbons.

3 Berthelot's Mechanics of Chemistry founded on Thermo-Chemical researches. both of which have been so ~~ably~~ presented & discussed by Prof. Cooke.

~~4~~

Refer very briefly to the progress of Nat: Hist & Geology. ~~Progress of the~~

Refer to the ~~brilliant~~ great work already begun in the Laboratories of Research in the U.S. In Physics & [illegible] Chem., in Petrology & my branch of Geology

1881

Notes of Address to N A S.
April 1881