

MEETINGS OF UNIVERSITY SOCIETIES.

Scientific Association.

October 7, 1879. Twenty-seven persons present.

(1) A statement of the object and history of the Association was given in a brief address by the President, PROFESSOR SYLVESTER.

(2) PROFESSOR REMSEN gave an account of results obtained by the Meyer Bros., from investigations upon the nature of chlorine; showing that at high temperatures its specific gravity changes.

(3) A brief general account of the work of the Chesapeake Zoological Laboratory in 1879, was given by DR. CLARKE.

The facilities for work were much superior to those of the first season. A steam-launch from the Navy Department, and a well-equipped steam-yacht, provided by Maj. Ferguson, were at the disposal of the party. Among the most important results obtained may be mentioned:

(1) The embryological history of a number of brachyuran crustacea representing various genera, worked out by Prof. E. A. Birge.

(2) A careful study of *Aequinotrocha* and its wonderful change into the adult *Phoronis* form, made by Mr. E. B. Wilson.

(3) The development of the ctenophore *Mnemiopsis*, by Professor Nunn, who succeeded in getting valuable results regarding the changes which accompany the fertilization of the egg.

(4) Some very interesting points in regard to the earliest changes which occur in the fertilized eggs of *Hippa*, by Dr. Emil Bessels.

(5) Professor Brooks secured a very complete series in the development of a squid (*Loligo*), one of the most interesting results from the study of which is the discovery of a rudimentary *velum* in this group of molluscs.

(6) The most valuable work of the season was done by Professor Brooks, on the development of the American oyster. Some of the most important points reached are:

a. The oyster is unisexual.
b. Segmentation is very rapid, and results, (in two to twenty-four hours,) in a free-swimming gastrula-form with a *velum*.

c. The blastopore closes; the endoderm and ectoderm separate, and the two valves of the shell are formed separate, at the edge of the closed blastopore.

d. The mouth is formed by invagination at a point opposite the closed blastopore, and the anus is formed close by.

e. The shell grows rapidly, the embryo sinks, becomes attached and soon acquires the adult form.

The segmentation of the oyster is very peculiar, and throws considerable light on the origin and relationship of the Lamellibranchs to various other molluscan groups. The scientific report is now under way, and promises to be a very satisfactory and valuable one.

November 5, 1879. Eighteen persons present.

(1) DR. STORY presented, with comments, a communication by Mr. A. B. KEMPE, of London, On the Geographical Problem of the Four Colors.

A résumé of Mr. Kempe's proof that every map on a singly-connected surface can be colored with four colors, with an extension of the proof to certain cases not considered by the author. (See Am. Journ. of Math. II. 3.)

Remarks were made upon this paper by Mr. C. S. PEIRCE.

(2) DR. BROOKS read a paper On the Method of Inductive Reasoning by Selected Evidence in Morphological Problems.

The destruction, by natural selection, of those transitional forms of animal life which should connect the great groups, has brought into use a peculiar method of logical reasoning, by which a general law, drawn from phenomena which are manifested by a single representative of a group, is applied to the whole group. The paper was an attempt to indicate the limitations and scope of this form of reasoning.

(3) DR. NICHOLS read a paper On the Nature of the Absorption of Gases by Liquids.

This phenomenon is a special case of fluid diffusion. Whenever a liquid and gas are in contact, such diffusion occurs.

The rate of diffusion depends upon the nature of the liquid and gas, the pressure and temperature. Absorption and evaporation are strictly analogous, in each case the point of saturation is reached when an equal number of molecules leave and enter the liquid in a unit of time.

In some cases something akin to chemical union seems to occur. It differs from the union between H and O in H_2O , C and O in CO_2 , &c., in that, when the saturated solution is heated or its pressure reduced, gas molecules are given off instead of the more complex molecules supposed to exist in the solution.

December 3, 1879. Twenty-five persons present.

(1) Remarks were offered by the Vice-President, PROFESSOR REMSEN in the Chair, expressing the great loss which the scientific world has sustained in the recent death of Prof. James Clerk Maxwell, Professor of Experimental Physics in the University of Cambridge, England.

From a letter of W. Spottiswoode, Esq., President of the Royal Society, London, to Prof. Sylvester:

"The death of Clerk Maxwell has made a sad gap in the ranks of science. He died after a short illness of a few weeks, from some internal inflammation to which it proved impossible to get access. He retained his faculties to the last, and was quite conscious of his approaching end. He had begun, and finished half of the first volume of a new edition of his Electricity. He had lately finished the volume of Cavendish's papers, which he had lately edited, but he was also pouring forth a great quantity of new matter which I fear no one can take up. Lord Rayleigh has, in reply to a very strongly-supported request, undertaken the professorship."

The members of this University may be interested in knowing that for several years Professor Maxwell has been interested in the work of Professor Rowland and of Professor J. Willard Gibbs, with the former of whom he frequently corresponded.

Lord Rayleigh, who has been chosen as the successor of Professor Maxwell, was recently President of the London Mathematical Society. Professor De Morgan was the first President of this Society, and Professor Sylvester the second.

(2) The regular communications of the evening were opened with a paper by MR. E. H. HALL, on a New Action of the Magnet on Electric Currents.

Mr. Hall's experiments show that when a strong magnetic current passes in the same direction as a neighboring electric current, it causes the latter to change its course. It is well known that magnets may act mechanically upon conductors bearing electric currents. But the fact that a magnet can act upon the electric current itself, and permanently modify the conditions of flow, even in a fixed conductor, is now for the first time made known. (This paper is printed in the American Journal of Mathematics for December 1879.)

(3) PROFESSOR ROWLAND offered two explanations of this phenomenon:

(1) That it is an action somewhat analogous to the magnetic rotation of the plane of polarization of light, i. e. the effect on the electric current is to cause it to rotate around the line of magnetic force.

(2) That it is a case similar to magneto-electric induction, the electric current being analogous to the moving conductor in the case of ordinary induction.

At the close of the meeting the Association adjourned to the Physical Laboratory, where a physical demonstration of this discovery was given by Mr. Hall.

(4) MR. C. S. PEIRCE discussed a new point in respect to the Geographical Problem of the Four Colors, showing by methods of logical argumentation that a better demonstration of the problem than the one offered by Mr. Kempe is possible. (See meeting of Nov. 5, 1879.)

(5) PROFESSOR REMSEN made a communication upon some experiments of Seelheim.

In the course of these, it was found that platinum, at high temperatures in the presence of chlorine is volatilized. Attention was called to the point that this fact will vitiate the results obtained by the Meyer Brothers in their experiments upon the nature of chlorine gas, in which they had discovered that chlorine at high temperatures changes its specific gravity.

(6) DR. IRBY gave a description of peculiar twin crystals of calcite (artificially produced), exhibiting specimens.

These crystals are produced by a process recently described by L. Baumhaer, of Lüdinghausen. The experiment was also tried in the presence of the Society, a portion of one crystal being transferred by pressure from the original to the twin position.

Historical and Political Science Association.

October 23, 1879. Forty-eight persons present.

(1) Address from PRESIDENT GILMAN on the Educational Progress of the United States from 1869 to 1879, since printed in the American Journal of Social Science, No. 9, Boston, 1879.

(2) Communication by DR. W. H. BROWNE, Librarian of the University of Old Maryland Land Grant, (dated 1673,) which was

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Internationale gradmessung. Permanente commission, Hamburg, 1878

VERHANDLUNGEN
DER VOM 4. BIS 8. SEPTEMBER 1878 IN HAMBURG VEREINIGTEN
PERMANENTEN COMMISSION
DER EUROPÄISCHEN GRADMESSUNG
redigirt von den Schriftführern
C. BRUHNS. A. HIRSCH.
ZUGLEICH MIT DEM GENERALBERICHT FÜR DAS JAHR 1878
herausgegeben vom
CENTRALBUREAU DER EUROPÄISCHEN GRADMESSUNG.
MIT ZWEI LITHOGRAPHIRTEN TAFELN.

COMPTES-RENDUS
DES SÉANCES DE LA COMMISSION PERMANENTE DE
L'ASSOCIATION GÉODÉSIQUE INTERNATIONALE
POUR LA MESURE DES DEGRÉS EN EUROPE
RÉUNIE À HAMBURG DU 4 AU 8 SEPTEMBRE 1878
rédigés par les secrétaires
C. BRUHNS. A. HIRSCH.
Publiés pour servir de rapport général pour l'année 1878
par
LE BUREAU CENTRAL DE L'ASSOCIATION GÉODÉSIQUE INTERNATIONALE
AVEC DEUX PLANCHES.

BERLIN, 1879.
VERLAG VON GEORG REIMER.
DRUCK VON P. STANKIEWICZ BUCHDRUCKEREI, BEUTH-STR. 5.

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Herr *Hirsch* theilt mit, dass laut eingegangener Schreiben die Herren *Faye* und *Ganahl* bedauern, nicht anwesend sein zu können, während Herr *Sainte-Claire Deville* seine Ankunft für morgen in Aussicht stellt.

Herr Director Dr. *Neumayer*, der bedauert durch Gesundheits-Rücksichten verhindert zu sein, den Sitzungen anzuwohnen, ladet durch ein Schreiben die Versammlung zur Besichtigung der Seewarte ein, wo unter Anderm ein Registrirpegel, welchen Herr *Reitz* für das geodätische Institut angefertigt hat, aufgestellt ist. Herr *Neumayer* stellt der Versammlung täglich zwei Exemplare der Wetterberichte zur Verfügung.

Der erste Gegenstand der Tagesordnung ist der Bericht der permanenten Commission, welchen Herr *Bruhns* in deutscher, Herr *Hirsch* in französischer Sprache vortragen.

Bericht der permanenten Commission.

Während der im vorigen Jahre vom 27. September bis 2. October abgehaltenen allgemeinen Conferenz in Stuttgart versammelte sich die permanente Commission daselbst am 1. October und 3. October. In der ersten Sitzung constituirte sie sich, indem Herr General *Ibañez* als Präsident, Herr *von Bauernfeind* als Vice-Präsident, die Herren *Bruhns* und *Hirsch* als Schriftführer wiedererwählt wurden; ihre Aufgabe in der zweiten Sitzung war, die Protokolle zu vollziehen und die Beschlüsse der allgemeinen Conferenz zur Ausführung zu bringen. Letzteres ist soweit geschehen als es möglich war; Herr *Baeyer* hat dem Grossherzoglich Badischen Ministerium in Carlsruhe die Beschlüsse der Conferenz in Betreff der Berechnung und Publication der Nivellements mitgetheilt.

Die permanente Commission beauftragte ihre Schriftführer, die Sitzungsberichte zu redigiren und durch das Central-Bureau den Druck besorgen zu lassen. Selbiges ist geschehen, und liegen die Sitzungsberichte in deutscher und französischer Sprache gedruckt vor, auch sind denselben eine Anzahl von Abhandlungen angehängt, und zwar:

- 1^a). Sur le mouvement simultané d'un pendule et de ses supports, par M. Ch. *Cellerier*;
- 1^b). De l'influence de la flexibilité du trépied sur l'oscillation du pendule à réversion par M. *Peirce*;
- 1^c), 1^d). Erste und zweite Note zu Herrn *Peirce's* Mittheilung von Th. *von Oppolzer*;
2. Dello stato attuale delle osservazioni mareografiche in Italia e dei relativi studi. Relazione di A. *Betocchi*;
3. Die Berichte der Specialcommission über die zwei wissenschaftlichen Fragen, die Ausgleichung der Dreiecksnetze betreffend, mit den Voten vieler Commissare.

Ferner ist den Sitzungsberichten der Generalbericht über die Fortschritte der Europäischen Gradmessung im Jahre 1877 angefügt und zum Schluss noch eine Abhandlung des Herrn *Plantamour*: „*Recherches expérimentales sur le mouvement simultané d'un pendule et de ses supports*,“ abgedruckt.

Das befriedigende Resultat dieser letzteren Untersuchungen ist, dass den Pendellängen, die mit dem Schweizer Apparat ermittelt sind, die Grösse $0^{\circ}1724 \pm 0^{\circ}0014$ für Genf und $0^{\circ}1302 \pm 0^{\circ}0032$ für die übrigen Schweizer Stationen, sowie $0^{\circ}1357 \pm 0^{\circ}0027$ für Berlin hinzugefügt werden muss.

Die permanente Commission hat durch Circular für die diesjährige Sitzung Hamburg einstimmig gewählt, nachdem dieselbe von dem Hohen Senate dieser Stadt eine freundliche Einladung erhalten hatte, für welche die permanente Commission hierdurch ihren lebhaften Dank sich auszusprechen erlaubt.

Die permanente Commission hat, wie leider fast alljährlich, auch dieses Jahr den Tod eines Commissars, des Directors der Delfter polytechnischen Schule, des Herrn *Cohen Stuart*, welcher besonders durch die Nivellements in Holland die Europäische Gradmessung gefördert hat, zu beklagen. Bewahren wir demselben ein freundliches Andenken.

Als neuer Commissar für Spanien ist Herr Oberst *Barraquer* eingetreten.

Mit Freuden können wir constatiren, wie auch aus dem Generalbericht hervorgeht, dass in allen beteiligten Ländern die Arbeiten der Europäischen Gradmessung fortgeschritten sind.

Eine Anzahl neuer Publicationen sind seit der vorigen Conferenz erschienen z. B. die Arbeiten des geodätischen Instituts in Berlin im Jahre 1877, enthaltend die Bestimmung des Längenunterschieds zwischen Berlin und Paris, Berlin und Bonn, Bonn und Paris; ferner ein Précisionsnivellement der Elbe; ein Werk „Ueber die Figur der Erde“ von Professor *Brunn*. Ein erster Theil des dritten Bandes der „Triangulation du royaume de Belgique, Observations astronomiques, partie théorique“, ist erschienen von dem Dépôt de la guerre in Brüssel. Ferner: „Die geodätischen Hauptpunkte der dänischen Gradmessung und ihre Coordinaten“; eine Publication der Schweizer Commission, enthaltend die Bestimmung der Längendifferenz zwischen Zürich—Pfänder—Gäbris; eine Publication der französischen Commissare: „Die Längenbestimmung zwischen Paris und Algier“, u. A.

Von den in diesem Jahre ausgeführten Arbeiten werden wir im Laufe dieser Sitzungen hören, und ist das Material, welches uns zur schliesslichen Ableitung der Grösse und Figur der Erde dienen wird, auch im verflossenen Jahre wesentlich vermehrt.

Herr *Sadebeck* trägt auf Ersuchen des Herrn *Baeyer* den Bericht des Central-Büros vor.

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