# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY




1902


BRITISH MUSEUM
NATURAL HISTORY

Sir Richard Temple, Bart., G.C.S.I., F.R.S., etc.
President of the Hampstead Scientific Society, from January, 1901,
until his death on 15th March, 1902.

*The Editor of the Hampstead and Highgate Express has kindly given permission for this reproduction of the above portrait.*

# Hampstead Scientific Society

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# Report of the Council and Proceedings

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With a List of the Members.

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*For the Year* 1902.

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PRICE THREEPENCE

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HAMPSTEAD N.W.
MDCCCCIII

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THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History and Photographic.

By the generous gift of Colonel Heberden, the Society is the possessor of a reflecting telescope of 10½ inch mirror, which is erected in a small observatory on the East Heath, by permission of the London County Council. Particulars as to the use of the Telescope can be obtained of the Hon. Astronomical Secretary.

A General Meeting of the Society is held at the Hampstead Library, Prince Arthur Road, on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 p.m. precisely. Meetings of the various Sections are also held regularly at the Hampstead Library.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, of having free access to the Telescope, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections; full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretary, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society can be obtained of the undersigned.**

BASIL W. MARTIN,
*Hon. Secretary of the Society,*
17, Denning Road,
Hampstead, N.W.

*March, 1903.*

# Hampstead Scientific Society.

## LIST OF OFFICERS
### FOR THE YEAR 1903.

Elected at the Annual Meeting, 6th February, 1903.

**President.**

Sir Samuel Wilks, Bart., M.D., LL.D., F.R.S.

**Vice-Presidents.**

Walter Baily, M.A., F.Z.S.*
Edward Bond, M.A., M.P.
Mrs. Sophie Bryant, D.Sc.
Prof. F. Y. Edgeworth, M.A., D.C.L.
Sir Henry Harben, J.P.
Prof. W. M. Flinders Petrie D.C.L., LL.D., F.R.S.
Frank Podmore, M.A.
Prof. Silvanus P. Thompson, D.Sc., F.R.S.
P. E. Vizard.*
Arthur Wilson, B.A.

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex officio*)

C. O. Bartrum, B.Sc.*
C. W. Cunnington, M.R.C.S.
H. B. Curwen.*
W. Garnett, M.A., D.C.L.
John Hayns, F.J.I.
James Hepburn.
E. S. Payne.*
Walter Schröder.
E. W. H. Shenton, M.R.C.S., L.R.C.P.
A. W. Stokes, F.C.S., F.I.C.
Edward Swain.
A. E. Tebb, M.D., B.S., D.P.H.
F. Womack, M.B., B.Sc.

**Hon. Treasurer.***

E. Compson Crump,
L. & S.W. Bank, Ltd.
High Street, Hampstead.

**Hon. Secretary.***

Basil W. Martin, F.Z.S.
17, Denning Road,
Hampstead.

**Astronomical Section:**
**Hon. Secretary ***

P. E. Vizard,
3, Pilgrim's Lane.
Hampstead.

**Photographic Section:**
**Hon. Secretary ***

J. P. Bushe-Fox.
Ben Lomond House,
Downshire Hill, Hampstead.

**Natural History Section:**
**Hon. Secretaries ***

J. W. Williams, M.R.C.S., F.L.S.
128, Mansfield Road, N.W.
AND
Basil W. Martin, F.Z.S., M.B.O.U.

**Executive Committee.*

# Report of the Council.

FOR THE YEAR 1902.

*Read at the Annual Meeting, 6th February, 1903.*

THE Council beg to report that 87 new members have been elected during the past year, and that allowing for resignations and removals the number of members now stands at 286, consisting of 204 gentlemen and 82 ladies; a total increase of 55 members since the last report.

The Council have to record with the greatest possible regret the loss the Society has sustained by the death of its second President, Sir Richard Temple, who died on the 15th March, 1902. The Council, at a meeting held on the 21st March, passed a vote of condolence and deepest sympathy with Lady Temple and her family, a warm tribute being paid to the untiring and constant interest displayed by the late President in the affairs of the Society.

As briefly mentioned in their last report the Council heard with the deepest regret of the death of Dr. Edmund Gwynn, on the 27th January, 1902, a Vice-President, who had been closely connected with the work of the Society since its formation.

At the General Meeting on the 4th April, 1902, Sir Samuel Wilks, Bart, F.R.S., was unanimously elected President of the Society for the remainder of the year.

The Accounts of the Society have been duly audited for the twelve months ending 31st December, 1902. A statement of Receipts and Expenditure appears on page 9. It is very much hoped that those members who are able will contribute more than the minimum of five shillings, as the work carried on by the Society and the Sections entails considerable expenditure. The Hon. Treasurer gratefully reports that among the subscriptions of various amounts there were : 14 at £1 1s., 2 at £1, 12 at 10/6, 26 at 10/-, and 10 at 7/6. Dr. Williams has generously borne the expenses of printing and postage for the Natural History Section.

The attendance at the General and Sectional Meetings has been good. The total number of meetings during 1902 was thirty-six.

Abstracts of the papers read and the proceedings at the meetings will be found accompanying this Report (see page 10).

Four Out-door Meetings have taken place during the year (see page 17).

Dr. J. W. Williams attended the Congress of the South Eastern Union of Scientific Societies at Canterbury last June, as the delegate of the Society. The attendance at the Congress was good and the proceedings were of great interest. The number of societies affiliated is thirty-seven—including the Hampstead Scientific Society. Members of affiliated societies are admitted to the Congress on payment of 2/6. The Congress will meet in June, 1903, at Dover.

The Council wish to record their thanks to Sir Samuel Wilks, Bart., F.R.S., for generously bearing the expenses in connection with the publication of his Lecture, "The Relation of Science to Art," delivered before the Society on May 12th, 1902.

In connection with the Astronomical Section, Mr. P. E. Vizard delivered a series of four lectures during January, February and March, and a further series of four lectures in November and December (see page 18). The Telescope has been visited by a good number of members and others during the past year; 135 visits in all having been made. Unfortunately a large number of the nights advertised proved unfavourable, the sky not being clear.

The Natural History Section has held seven meetings, when the papers and exhibits were of exceptional interest, an account of which appears on page 20. It is to be regretted that the material for the publication of "The Fauna and Flora of Hampstead and Its Neighbourhood" was not sufficiently advanced for the first part to have appeared during 1902. It is hoped, however, that an announcement will be made before very long. The General Editors are Mr. Basil W. Martin, F.Z.S., and Dr. J. W. Williams, F.L.S.

The Photographic Section has held twelve meetings and proves a very popular Section of the Society. A full list of the meetings appears on page 25.

The Council wish to put on record that the Conversazione held at the Town Hall on October 29th to inaugurate the fourth Session, was an unqualified success, there being over two hundred and fifty people present. The Society is very much indebted to Prof.

Boyd Dawkins, D.Sc., F.R.S., who kindly gave an Address on "The Forest Primæval of the Coal Measures" (see page 15.)

The Council have pleasure in reporting that the Borough Council has consented to maintain a public museum and art gallery, provided that the money for the erection of the necessary buildings can be raised by public subscription. A deputation from the Society, consisting of Sir Samuel Wilks, Bart., F.R.S., and Mr. Basil W. Martin, F.Z.S., attended the Meeting of the Borough Council on Thursday, 16th October, 1902, when a Petition, together with one of the same nature from each of the other Societies in Hampstead, was presented for the purpose of obtaining the sanction of the Borough Council to the scheme. The Council of the Society sincerely trust that the members will give it their hearty support.

The Council desire to place on record their high appreciation of the valuable services rendered by the Hon. Secretary, Mr. Basil W. Martin, F.Z.S., which have been given with marked advantage to the Society from its formation to the present time.

In accordance with Rule 16, the Council beg to recommend that Prof. Boyd Dawkins, D.Sc., F.R.S., be elected an Honorary Member of the Society.

# STATEMENT OF ACCOUNTS.

## For the Year ending 31st December, 1902.

### RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| Balance brought forward ... ... ... ... | 2 | 11 | 11 |
| 1902 Subscriptions paid in 1901, brought forward ... | 13 | 7 | 6 |
| Subscriptions paid in and for 1902 ... ... ... | 65 | 3 | 6 |
| Donation—Sir Samuel Wilks, Bart., M.D., F.R.S. ... | 7 | 5 | 6 |
| Sale of Conversazione Tickets ... ... .. ... | 4 | 3 | 0 |
| Lecture Ticket sold ... ... ... ... ... | 0 | 2 | 0 |
| Year's Receipts ... ... ... ... ... ... | 92 | 13 | 5 |
| Loss on Year's Working, deficit due to Treasurer ... | 16 | 0 | 11 |
| | £108 | 14 | 4 |

### EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... ... | 16 | 19 | 3 |
| Report for 1901 . . ... ... ... ... ... | 8 | 1 | 0 |
| Rent for Lecture Rooms... ... ... ... ... | 10 | 19 | 0 |
| Advertisements ... ... ... ... ... ... | 6 | 2 | 0 |
| Do. of Syllabus ... ... ... ... ... | 5 | 2 | 0 |
| Royal Photographic Society Subscription ... | 1 | 1 | 0 |
| S. E. Union Scientific Societies ,, ... ... | 0 | 10 | 0 |
| Field Nat. Quarterly Subscription ... ... ... | 0 | 10 | 0 |
| Photographic Section, for Special Expenses ... ... | 7 | 19 | 5 |
| Operating Lantern, etc. ... ... ... ... .. | 5 | 2 | 0 |
| Repairs, Telescope House ... ... ... ... | 6 | 5 | 6 |
| Conversazione Expenses ... ... ... ... ... | 16 | 8 | 2 |
| Sundry Expenses, per Hon. Secretary— | | | |
| Postages ... ... ... ... 11 13 2 | | | |
| Stationery ... ... ... 2 4 7 | | | |
| For Small Items ... ... ... 8 1 3 | | | |
| Floral Tributes ... ... ... 1 16 0 | | | |
| ——— | 23 | 15 | 0 |
| Year's Expenditure ... ... ... ... | £108 | 14 | 4 |

Subscriptions for 1903 paid in 1902, £20 3s. 6d.—In Hand, £20 3s. 6d.

E. COMPSON CRUMP, *Hon. Treasurer.*
*31st January, 1903.*

*Audited and found correct,* E. S. PAYNE,
WALTER SCHRÖDER.

# Abstract of Proceedings.

1902.

## General Meetings.

Friday, 3rd January. Mr. Walter Baily, M.A., a Vice-President, in the Chair.

The Rev. F. A. Walker, D.D., F.L.S., F.E.S., gave a lecture on "The Entomology of Iceland," illustrated by specimens.

Dr. Walker first gave a brief review of previous entomological explorations into Iceland and then described the *raison d'être* of the scientific expeditions of 1889 and 1890. The total absence of butterflies there, he said, was for long a disputed point, but was now an established fact. There were three orders of insects occurring in largest numbers both of species and individuals, Lepidoptera heterocera (Moths), Coleoptera (Beetles), and Diptera (Flies), while Neuroptera were only represented by Phryganidæ. The lecturer spoke of the scarcity of Hymenoptera, and the similarity of the Icelandic and Scotch fauna, extending to melanic and albino types, and said there was possibly a slight admixture of Lapland and Finnish forms in Iceland. Stale fish were much frequented by Diptera, whilst buttercups were greatly affected alike by Geometridæ and Diptera, and the siesta of Noctuæ on wild thyme was a sight peculiar to Iceland.

On Friday, 31st January, 1902, the Annual General

Meeting was held under the presidency of Mr. Walter Baily, M.A., a Vice-President, in the absence, through illness, of the President, Sir Richard Temple, Bart. The Report of the Council was read and adopted. Sir Richard Temple, Bart., was elected President for the year 1902, and the officers and Council were also elected.

Dr. Lindsay Johnson, F.R.C.S., gave an address entitled "A Century's Progress in Colour Photography and the Knowledge of Colour Vision."

Friday, 7th February, 1902, Sir Samuel Wilks, Bart., M.D., F.R.S., a Vice-President, in the Chair.

Mr. Walter Baily, M.A., gave a lecture entitled "The Zero of Temperature," illustrated by experiments. The lecturer said that the position of the zero of temperature, at which there would be absolutely no heat, had been known for many years, but had attracted little attention until quite recently, when the great advance in obtaining low temperature had caused this point of absolute cold to be nearly reached. Liquids, such as mercury, alcohol, or ether, were conveniently used in thermometers to determine temperatures, but they could give no standard scale of temperature, as they expanded irregularly, and the laws of their expansion were not understood. As to gases, the expansion with temperature was always the same under constant pressure, whatever gas was used, and the size of a certain quantity of gas was in proportion to the quantity of heat in it. Hence, in a gas, the size was the measure of heat, and might be properly taken as the standard measure of temperature. The construction of a gas thermometer was explained, and an experiment was shown in which the volume of a certain quantity of air was observed at two different temperatures, from which the lecturer explained how the absolute zero could be calculated. This was 273 degrees centigrade below freezing point of water (-460 F.). A diagram was shown, representing a ther-

mometer graduated in centigrade degrees from the absolute zero, and it was pointed out that mercury froze at 235 degrees above the absolute zero, and alcohol at 145 degrees. Below this temperature an air thermo meter could be used until oxygen turned liquid at 92 degrees, and then a hydrogen thermometer could be used until that gas liquified at 23 degrees. Below this point the only gas which remained in that condition was helium, which was therefore the only substance of which thermometers could be made for temperatures below 23 degrees. The lowest temperature yet reached was that at which hydrogen became solid, viz., 16 degrees above absolute cold.

Friday, 7th March, 1902. Sir Samuel Wilks, Bart., M.D., F.R.S., a Vice-President, in the Chair.

Mr. Martin Jacoby, F.E.S., read a paper entitled "Insects at Home and Abroad." Mr. Jacoby gave an account of the more familiar insects to be met with in houses and gardens, and made remarks on their habits, lives, and injurious or beneficial effects. He also drew attention to the many erroneous ideas in connection with familiar insects. After which he spoke in glowing terms of the enormous number of handsome butterflies, moths and other insects to be found in the tropics, especially in South America and the great Malayan Islands. The fauna of the latter places often enabled us to form an idea as to which of the neighbouring continents these islands were probably formerly attached, since the same species were found in both.

Friday, April 4th, 1902. Sir Samuel Wilks, Bart., M.D., F.R.S., a Vice-President, in the Chair.

The Chairman, before the commencement of the business of the evening, spoke in feeling terms of the late Sir Richard Temple, the President of the Society,

and the great loss the Society had sustained by his death. The Council of the Society had already passed a vote of condolence with Lady Temple and her family, and he asked the Hon. Secretary to read that resolution, which the meeting would be asked to adopt.

The Hon. Secretary then read the resolution as follows, which was unanimously adopted by the meeting:

"*Minute of Council, 21st March, 1902.*—On the motion of the Chairman a vote of condolence and deepest sympathy with Lady Temple and her family in their bereavement was passed. A warm tribute was paid to the untiring and constant interest displayed by the late President in the affairs of the Society. The Council wished to put on record the great sorrow of the members at the loss to the Society of its distinguished and accomplished President, Sir Richard Temple."

Sir Samuel Wilks, Bart., F.R.S., was unanimously elected President of the Society for the remainder of the year 1902.

Dr. Edward W. H. Shenton, M.R.C.S., L.R.C.P., read a paper entitled "The Medical Application of the Röntgen Rays" (illustrated with numerous skiograms and X-ray apparatus).

The lecturer showed the use of the rays in the treatment and diagnosis of disease. The results, he said, with regard to rodent ulcers, a mild form of cancer, were highly satisfactory. He warned his hearers against giving credence to reports of cancer-cures, as, although there were undoubted cases of disappearance of the growth under X-ray treatment, it was impossible to say that cancer was cured until the case had been watched for many years.

The lecturer pointed out how useful the rays are in the diagnosis of disease, most bone-lesions being capable of detection by their means, and that they had done much towards perfecting bone-surgery. With suitable apparatus exposures should never exceed one minute;

and dermatitis, or skin-trouble, except in rare instances, was the fault of the operator. Not a single case had occurred in Guy's Hospital Radiographic Department.

Dr. Shenton showed a number of objects under the X-rays, and exhibited a high-frequency apparatus.

Friday, 7th May, 1902, Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

Dr. G. D. Pidcock, M.A., M.R.C.P., read a paper entitled "Bacteria and their Allies," illustrated by lantern slides, and by diagrams and microscopical specimens.

The lecturer, after pointing out the importance of Bacteriology at the present time in connection with the medical and other sciences and industries, gave a short history of its origin and progress, from about 250 years ago, when Leeuwenhoek first discovered bacteria in putrid water. A description of how bacteria exist in air, water and soil, was then given. The process of sterilisation was briefly described, and the method of growing bacteria artificially in various media, for studying them systematically. The various forms of bacteria were then described in detail, together with the effects wrought by their growth, often in the shape of disease. Photomicrographs of many of them were thrown on the screen, together with the malaria organism, showing its life history in man and the mosquito. Special mention was made of the recent discoveries with regard to the fertilising of soil by bacteria. Photographs were shown of the very remarkable effects on the growth of certain of the leguminous plants, when grown in soil inoculated with their own special bacterium and when not so treated. Finally, Dr. Pidcock pointed out that were it not for the decomposing action of the putrifactive bacteria on dead animal and vegetable matter, the higher plants could not exist; and, again, without plants to feed upon, the higher animals would, of course, soon become extinct. The bacilli, which are the cause

of diphtheria, leprosy and woolsorter's disease, were shown under the microscope.

On Monday, the 12th May, 1902, Sir Samuel Wilks, Bart., F.R.S., President of the Society, delivered a lecture entitled "The Relation of Science to Art; in Reference to Taste and Beauty." Mr. Edward Bond, M.P., President of the Hampstead Art Society, was in the Chair.

This Lecture has been published by the Society, and can be obtained from Mr. S. C. Mayle, 70, High Street, Hampstead, price 7d., post free.

On Wednesday, 29th October, 1902, a very successful Conversazione was held at the Town Hall, to inaugurate the Session 1902—3. Prof. Boyd Dawkins, M.A., D.Sc., F.R.S., very kindly gave an address on "The Forest Primeval of the Coal Measures," illustrated by lantern slides. Sir Samuel Wilks, Bart., F.R.S., the President, was in the Chair. During the evening a choice selection of music was given by a string quartette consisting of Mr. Herbert McQuown, Dr. A. E. Tebb, Dr. C. N. Cobbett and Dr. F. Womack; with Mr. William Gardner at the piano; and Mr. Martin Jacoby played some admirable violin solos. Dr. Edward W. H. Shenton exhibited Röntgen ray and high frequency apparatus; and there were microscopical exhibits by Messrs. A. W. Stokes, C. O. Bartrum, K. I. Marks, Basil W. Martin, Dr. Lindsay Johnson, Dr. Pidcock, Dr. Williams, Dr. Jessop, Dr. J. W. Anderson, and Messrs. R. & J. Beck, Ltd.

Friday, 5th December, 1902. Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

Mrs. Sophie Bryant, D.Sc., read a paper on "Bees as Builders of the Honeycomb and otherwise."

The lecturer introduced the subject by a rapid

sketch of the history of a bee community from the time of the renewal of active life in Spring, till the abdication of the queen-bee in anticipation of her successor's birth, and the colonising flight of the faithful emigrant-swarm following her lead. The subsequent career of the remnant left in charge of the old hive and of the rising generation—their nephews and nieces—just born, or coming to birth out of the brood cells, was next detailed, the special points of interest being (i.) The young queen's destruction of her natural rivals, the sister princesses, still dormant in the royal cells; (ii.) The marriage flight; (iii.) The career of the drones and their final massacre; and (iv.) The winter-sleep. Returning to the story of the emigrant swarm, the lecturer touched briefly on possible contingencies in the absence of the bee-keeper and then went on to describe the procedure of the colony when once it gets itself safely lodged in the comfortable hive provided for it by its captain of industry, the honey-grabbing man. The clustering of the bees with the wax-makers in their centre, the deposition of the flat cakes of wax hanging from the roof, and the final architectural achievement of excavating and building up the honeycombs, all this was described in detail. A magnified model of the honeycomb made of separate cells, fitting together in two layers, was then shown, and the advantages of the form for maximum stability and economy of wax being noted, the lecturer stated as the central object of her discourse, the investigation of the problem how far does the geometrical nature of things co-operate with the social intelligence of the bee in producing this ideally perfect cell-structure. It was shown (i.) That if a space is filled as closely as possible with deformable spheres which are then squeezed together uniformly until no interstices are left, each sphere becomes a twelve-faced solid with rhombic faces, eight of whose fourteen vertices are of the same shape as the end of a bee-cell; (ii.) If, therefore, two layers of cylinders

with spherical ends be arranged with the spherical ends fitting as closely as possible, and the whole be squeezed together uniformly, a structure of solids exactly like the honeycomb will be the result; (iii.) That this result is geometrically identical with the result which would be obtained by two sets of similar excavating agents distributed uniformly and as densely as possible (relative to the size of the holes they make) on two sides of a thick plate of material to be excavated, provided that the excavators on each side are in positions relative to those on the other side, corresponding to the axis of the opposite layers of cylinders in (ii.). This proviso, it would seem, is a remarkable part of the achievement to be ascribed to the social intelligence of the bee in the architecture of the honeycomb. The lecturer concluded with a brief account of the subsequent history of the colonising swarm of bees.

## Outdoor Meetings.

On Saturday afternoon, 19th April, 1902, a party of members of the Society visited the Museum of Practical Geology in Jermyn Street. Mr. F. W. Rudler, F.G.S., the Curator, conducted the members round the Museum and pointed out and explained all the most salient features of the interesting collections.

On Saturday, May 3rd, 1902, a ramble in the neighbourhood of Northwood was conducted by Mr. James E. Whiting. The company assembled at Northwood Station, and after strolling across the Common, took the road

which leads through the fields and lanes to Batchworth Heath, where tea was provided at "Ye Olde Greene Manne."

On Thursday, 19th June, 1902, a party of members visited the Zoological Society's Garden in Regent's Park. In the unavoidable absence of Mr. Bartlett, the Superintendent, Mr. Basil W. Martin, F.Z.S., conducted the members round. All the more important houses and enclosures were visited, and their occupants were pointed out and described.

On Saturday, 12th July, 1902, a visit was paid to Ken Wood, by kind permission of Lord Mansfield. The party was conducted by Mr. James E. Whiting and the Hon. Secretary, Mr. Basil W. Martin; Mr. P. E. Vizard giving a short history of Ken Wood.

## Astronomical Section.

Two Courses of Lectures, as under, were given by Mr. P. E. Vizard :—

Monday, January 27th.—"The Calendar."

Different Starting-points for Time-Reckoning; Jews, A.M.; Romans, A.U.C.; Mahometans, the Hegira; Christians, A.D.; Divisions of Time (Year, Month, Week, Day) in vogue among different Nations, Ancient and Modern; the Julian Calendar; the Gregorian Calendar: History of its Adoption by England Old and New Style.

Monday, February 10th.—"The Poles and their Movements."

The Celestial Pole: not a fixed point, describes a circle in 26,000 years; Precession of the Equinoxes; The Terrestial Pole: Is

it a fixed point? Efforts made to reach it; Condition of things at the Pole: as regards the Compass, the Seasons, Day and Night, the Rising and Setting of Stars, the Moon, etc.

Monday, February 24th.—"The Great Ice Age."

Geological evidences of its Existence; Its Cause—owing to changes in ellipticity of the Earth's Orbit, etc.,; Bearing of the Subject on the Age of the Earth.

Monday, March 10th.—"The Astronomy of "Paradise Lost.'"

The Astronomy of Milton and Dante compared; The Localities of Milton's Heaven, Hell, Earth, Chaos, etc.; Milton's Age a period of Transition, hence both the Ptolemaic and Copernican Systems given in the Poem; Astronomical Effects of the "Fall."

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Thursday, November 6th.—"Comets and Shooting Stars." (Illustrated by Lantern Slides.)

Objects of alarm and supposed portents of calamity in early times Orbits of Comets, their Origin and Composition; History of the chief recorded Comets.

Shooting Stars, their Nature, Origin, and Destiny; Aerolites Meteor Swarms; November Meteors; connection between Comets and Shooting Stars.

Thursday, November 20th.—"Astrology."

Its History and Antiquity; its relation to Astronomy; references to it in the Bible, Shakespeare, Scott, etc.; method of erecting a "Horoscope" or "Nativity"; Astrological character of the various Planets: Influence of the Heavenly Bodies on the Earth; Astrological Words in our Language; Belief in Astrology in the Present Day; its nature and consequences.

Thursday, December 4th.—"Birth, Growth and Death of Worlds." (The Nebular Hypothesis.)

Difference between old and new ideas as to Scientific Method theory of Kant and Laplace; Planets thrown off from Sun,and Moons from Planets; Arguments for and against the Theory; Planets in different stages of Evolution; Saturn's Ring;

Various forms of Nebulæ; Theory of the Origin of the Minor Planets; Exhaustion of Light and Heat; Dark Stars; Scientific Hypothesis and Imagination.

Thursday, December 18th.—"Astronomy in the Poets."

Astronomical references in Chaucer, Spenser, Shakspeare, Milton, Tennyson. etc.

A considerable number of members and their friends have visited the Society's Telescope during the year; the total number of visits having been 135. The unfavourable state of the weather again proved a great hindrance on several occasions.

## Natural History Section.

Friday, 10th January, 1902. Professor Edgeworth, M.A., D.C.L., in the Chair.

A collection of land and fresh-water mollusca from the United States, was exhibited by Mr. Hugh Findon. Mr. Basil W. Martin, F.Z.S., showed an exceptionally large Mole (*Talpa europœa*, Linn.) which had been caught on Hampstead Heath, and sent by Mr. J. E. Whiting for exhibition. The specimen measured nine inches in total length. Mr. Martin also exhibited, on behalf of Mr. Whiting, a Hampstead specimen of the Lesser Redpoll (*Linota rufescens*, Vieill.) and pointed out that the bird was an occasional visitor to the neighbourhood in autumn and winter. Mr. F. W. Bourne of Messrs Arnold and Sons, showed a new "electric flash lamp," which might be useful in "mothing."

Dr. J. W. Williams, F.L.S., F.R.M.S., gave a

lecture on "The Anatomy of a Sea-Anemone," taking *Actinoloba dianthus* (Ellis) as the type. Reference was made to the general anatomy and physiology of Amœba (as illustrative of cell-life), and of Hydra (as illustrative of the typical structure of a cœlenterate). A detailed account of the anatomy of the sea-anemone was given illustrated by diagrams, dissections, and microscopical preparations. Mr. Martin Jacoby, F.E.S., exhibited and made remarks upon a collection of Coleoptera from South America.

Friday, 14th February, 1902. The Rev. F. A. Walker, D.D., F.L.S., in the Chair.

Mr. F. P. Smith gave a lecture entitled "Spiders and their Ways," illustrated by nearly fifty excellent lantern slides. The structure, classification, and habits of spiders were fully dealt with, and also the way in which they should be preserved for scientific purposes.

Friday, 14th March, 1902. Sir Samuel Wilks, Bart., M.D., F.R.S., in the Chair.

The Rev. F. A. Walker, D.D., F.L.S., gave a lecture entitled "The Entomology of Paris and its Neighbourhood" (illustrated by exhibits). Dr. Walker enumerated the insects he had met with during June, July and September, 1901, in the suburbs and environs of Paris, and made special reference to the Hymenoptera.

Dr. J. W. Williams, F.L.S., F.R.M.S., exhibited *Volvox globator*, and made some remarks upon its structure, methods of reproduction, and "place in nature." Dr. Williams pointed out that some authorities now classed it neither among the plants nor among the animals, though the zoologist and the botanist each claimed it. Mr. K. I. Marks, F.R.M.S., exhibited under the microscope a L.S. of the leaf of *Ficus elastica* showing cystoliths. Mr. Montagu F. Hopson, F.E.S., showed a series of *Dilina tiliæ* (Lime-hawk Moth), *Ithysia zonaria*

(Belted Beauty), and *Amphidasys betularia* (Peppered Moth). Mr. Hugh Findon exhibited and make some remarks upon a collection of Ammonites. Mr. Basil W. Martin, F.Z.S., made remarks upon Prjevalsky's Horse (*Equus prjevalskii*) which had lately arrived in the Zoological Society's Gardens and pointed out that it was a true horse and in all probability the descendant of the original stock from which the horse of domesticity had been derived.

Friday, 11th April, 1902. Sir Samuel Wilks, Bart., M.D., F.R.S., in the Chair.

Dr. J. W. Williams, F.L.S., exhibited under the microscope and otherwise, specimens of the fresh-water sponge (*Ephydatia fluviatilis*) and opened a discussion on its structure and affinities. Specimens of *Philodina roseola* (Ehr.), a "revivified rotifer," were shown by Mr. K. I. Marks, F.R.M.S. Mr. Basil W. Martin, F.Z.S., exhibited on behalf of Mr. J. E. Whiting, a case of the Indian Leaf Butterfly (*Kallima huttoni*), illustrating protective resemblance. Mr. Montagu F. Hopson, F.E.S., exhibited specimens of Clear-wing Moths, which superficially resemble wasps, hornets or bees, and are examples of a form of mimicry. Mr. Hugh Findon read a paper entitled "The Approximation of the Forms of Living Mollusca to their Fossil Prototypes." Mr. Findon illustrated his subject with a number of recent shells, together with their fossil forms, and showed very clearly how the types persist through the different deposits to the present day. Dr. J. W. Williams exhibited under the microscope a L.S. through the eye of *Pecten opercularis*, as an example of a molluscan eye.

Friday, 9th May, 1902. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Mr. K. I. Marks, F.R.M.S., exhibited *Protococcus pluvialis* (Br.), and read a short paper upon this and

allied species. Mr. Hugh Findon showed a series of *Helix*, exhibiting gradations in contour. Mr. Montagu F. Hopson, F.E.S., exhibited a series of *Eurymus hyale* (Linn.) *E. hyale* var., *helice* (Stephens), and *E. kirbyi* (Lewis). Mr. A. R. Gillman, F.Z.S., exhibited and made remarks upon a Bluethroat (*Cyanecula suecica*, Linn.), and a Hampstead Tree-creeper (*Certhia familiaris*, Linn.). Dr. J. W. Williams, F.L.S., showed a Gymnoblastic Hydroid, *Tubularia larynx* (E. and S.), and described its structure and life-history, and he also exhibited a T.S. of the foot of *Helix aspersa* (Linn.). Sir Samuel Wilks, F.R.S., exhibited on behalf of Mr. J. E. Whiting, specimens of the Mining Bee (*Andrena fulva*) found on Hampstead Heath, and read a short note about them. Mr. Basil W. Martin, F.Z.S., M.B.O.U., read a paper entitled "Feathers: Their Structure and Uses," illustrated with diagrams and microscopical preparations.

Friday, 14th November, 1902. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Mrs. Beach exhibited a collection of Mosses, the majority being British, and made some remarks upon them. Mr. K. I. Marks, F.R.M.S., showed *Synchæta pectinata* (Ehr.), and read a note on this rotifer. Mr. Hugh Findon exhibited a collection of Hampstead Mollusca, made by him in 1902, and enumerated twenty-three species of snails and slugs as the first part of his list of Hampstead Mollusca. Dr. J. W. Williams, F.L.S., exhibited under the microscope a section through the digestive gland of *Helix aspersa* (Linn.), and drew attention to its structure and functions. He stated that the functions of this gland were very complex, and that the name, "hepato-pancreas," given to it by some authors, did not sufficiently describe it. It was a maker of glycogen, a storer of calcium phosphate, and a secretor of a proteolytic ferment, which was similar to, if not identical

with, the trypsin in the pancreatic juice of mammals. The calcium phosphate was probably used up in the making of the autumn epiphragm; and the glycogen combined with the intra-molecular oxygen in the muscle-tissues, producing a "chemical explosion," which resulted in the characteristic slow wave-like contraction of unstriated muscle in the Mollusca and in unstriated muscle generally. Mr. Basil W. Martin, F.Z.S., exhibited on behalf of Mr. J. E. Whiting, a Pied variety of the Common Blackbird (*Turdus morula*, Linn.), and stated that it was recently found dead in Avenue Road, St. John's Wood.

Mr. C. S. Nicholson, F.L.S., read a paper entitled "Local Variations in Plants," and illustrated it with a number of specimens from his herbarium.

Friday, 12th December, 1902. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Mrs. Park exhibited a number of Jurassic Fossils, and read explanatory notes of the Jurassic formations. Mr. Hugh Findon, on behalf of Mr. George Dolman, showed *Apiocrinites parkinsoni* from the Bradford Clay. Mr. Frank Podmore, M.A., exhibited the impression of the foot of a Cretaceous Deinosaur (Iguanodon). Mr. K. I. Marks, F.R.M.S., read a paper on "The Rotifera —their Haunts and Habits." Mr. Marks's paper was illustrated by drawings and living specimens under the microscope. Dr. J. W. Williams, F.L.S., made some remarks upon *Testacella haliotidea* and *T. scutulum*, and described the anatomical distinctions between these two species. *Testacella scutulum*, he said, was a common slug in North London, but very often overlooked because in its quiescent condition it resembled a pebble.

# Photographic Section.

COMMITTEE FOR 1903:

Miss Blyth, H. B. Curwen, P. Joshua, Miss Kearne, E. G. Neville, J. P. Bushe-Fox (Hon. Secretary.)

During the past year substantial progress has been made by this Section. A keen interest has been shown by the members, and the attendance at the meetings has been excellent.

The Lectures and Demonstrations, of which twelve have been given during the year, proved most interesting and instructive, both to beginners and the more advanced.

A Conversazione was held on May 23rd, 1902, when a loan collection of photographs, from the Royal Photographic Society, which included the work of many leading photographers, was exhibited. Some very good examples of X-ray work, by Dr. Shenton, were also shown.

At a meeting held on October 13th, 1902, it was decided to form a Sectional Fund to provide prizes, etc., and to meet the many extra expenses incurred by the Section.

The Annual Exhibition was held on December 19, 1902. There were nearly twice as many exhibits as at the previous exhibition, and the general standard of the work was extremely good. Mr. J. C. S. Mummery, F.R.P.S., kindly consented to act as Judge, and he awarded the silver medal to Mr. J. P. Bushe-Fox, and the bronze medal to Mr. E. G. Neville. The prize for

the special competition was won by Mr. H. B. Curwen. Excellent work was also shown by Messrs. H. J. Aubrey, R. H. Prance, Miss Blyth, and Mrs. Shenton. The exhibition was also open on the Saturday morning following.

Altogether the work of this Section shows great promise, and it is fully anticipated that much good work will be done and many new members enrolled during the forthcoming year.

The following is the list of meetings held during year :—

1902.

Jan. 8.—"Portraiture," Illustrated with Slides by Mr. Harold Baker.
24.—Demonstration on the Carbon Process.
Feb. 12.—"Pictorial Photography," Illustrated with Slides by Mr. Horsley Hinton.
Mar. 12.—"Architectural Photography," Illustrated with Slides by Mr. H. W. Bennett.
April 9.—"Flower Photography," Illustrated with Slides by Mr. H. T. Malby.
25.—Practical Demonstration on Development, by Mr. P. Joshua.
May 23.—Conversazione. Loan Collection of Photographs.
Oct. 13.—Business Meeting.
Nov. 12.—Bromide Enlarging Demonstration, by Mr. J. P. Bushe-Fox.
28.—Slides of Canadian Scenery, by Members of the Toronto and Montreal Camera Club.
Dec. 10.—"Lantern Slide Making," Illustrated with Slides by Mr. J. A. Hodges.
19—Annual Exhibition.

# Hampstead Scientific Society.

## Rules.

*As amended and approved at the Annual Meeting, 6th February, 1903.*

1. The Society shall be called the "HAMPSTEAD SCIENTIFIC SOCIETY," and shall have for its objects the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science.

2. The Society shall consist of ordinary members, ladies and gentlemen, who shall pay a minimum Annual Subscription of Five Shillings, and of Honorary Members. All Subscriptions shall be due on the 1st January in each year.

3. The Officers of the Society shall consist of a President, Vice-Presidents, Honorary Secretary and Honorary Treasurer, and a Council of Members not exceeding fifteen, including the Honorary Secretaries of Sections.

4. The President, Officers, and Council shall be elected annually.

5. The business of the Society shall be conducted by the Officers and Council in general Committee, five to form a quorum. The Council may appoint an Executive Committee for the purpose of transacting and arranging details in connection with the general work of the Society. The Executive Committee to consist of not less than seven, of whom the Honorary Treasurer, Honorary Secretary, and Sectional Honorary Secretaries shall be ex officio members. The Council of the Society shall meet not less than twice in each year.

6. The Council shall prepare, and cause to be read at the Annual Meeting of Members, a Report on the affairs of the Society for the preceding year.

7. Two auditors shall be elected at the Annual Meeting, who shall audit the Treasurer's Accounts, and the Treasurer shall produce a Balance Sheet and Statement of Accounts at the Annual Meeting.

8. Candidates for membership shall be proposed by an existing member and seconded by one or more members. The election of members may take place at any ordinary meeting of the Society. The voting to be by show of hands, or by ballot, and when a majority of members present are in favour of the candidate, he or she shall be duly elected

9. No new member shall be entitled to any of the privileges of the Society until the Subscription for the current year shall have been paid.

10. Each member shall have the right of being present, and to vote, at all general meetings of the Society, and to propose candidates for membership. Each member shall also have the privilege of introducing two visitors to the ordinary and field meetings of the Society.

11. No member shall have the right of voting or be entitled to any of the advantages of the Society if his, or her, subscription shall be twelve months in arrears. If any member's subscription shall be in arrears for two years the Council shall have the power, in its discretion, to remove his or her name from the list of members.

12. The Annual General Meeting shall be held during the first three months of the year, for the election, or re-election, of Officers for the year ensuing, to receive the Reports, and to transact any other business.

13. The Ordinary Meetings of the Society shall be held on the first Friday in the months of November, December, January, February, March, April and May, or at such other date, and at such place, as may be determined by the Council.

14. At the written request to the Secretary of not less than ten members, a Special Meeting may be summoned, and no other business may be transacted but that which was stated on the notice convening the meeting. Ten days notice in writing shall be given by the Secretary to each member of the Society; such notice to contain a copy of the requisition.

15. The telescope, and any instruments, books, slides, etc., in the possession of the Society shall be made available for members' use under such regulations as the Council may direct.

16. The Council shall have the power to recommend to the members any gentleman or lady, not a member of the Society, who may have contributed scientific papers, or otherwise benefited the Society, to be elected an Honorary Member; such election to be by show of hands.

17. Separate Sections of the Society may be formed, at the discretion of the Council, for the purpose of carrying on work in particular branches of Science. The Honorary Secretary of each Section shall be an ex officio member of the Council and Executive Committee.

18. No alteration or addition to these Rules shall be made except at the Annual General Meeting, or at a meeting specially convened for the purpose. Notice of any such proposed alteration shall be given to the Secretary at least fourteen days before the Annual Meeting.

# List of Members.

***Corrected to 6th March, 1903.***

**Members are particularly requested to notify any change of address to the Hon. Secretary of the Society, 17, Denning Road, Hampstead, N.W.**

## Honorary Members.

Dawkins, Prof., W. Boyd, M.A., D.Sc., F.R.S., Owen's College, Manchester
Heberden, Colonel Henry, R.A., J.P. ... 28, Buckland Crescent, Hampstead
Jermyn, F. Lubbock ... ... ... 135, King's Road, Brighton

## Ordinary Members.

Abbott, Rev. E. A., D.D. ... ... Wellside, Well Walk
Adams, Thomas... ... ... ... 3, Christchurch Road
Adams, W. Coode, M.B. ... ... 1, Eton Avenue
Alcock, S. P. ... ... ... ... 5, Rudall Crescent
Allcock, Miss N. ... ... ... 20, Shirlock Road, Gospel Oak
Ambrose, Lawrence ... ... ... Westover, West Heath
Anderson, Douglas ... ... ... 13, Nassington Road
Anderson, J. W., M.D. ... ... Fawley House. Fawley Road
Andrews, E. Collingwood, M.A.,M.D.... 110, Finchley Road.
Ashworth, Percy H. ... ... ... 30, Heathurst Road
Aubrey, Hampton J. ... ... ... 3, Fawley Road, West Hampstead
Avenell, George ... ... ... 56, Mansfield Road

Baily, Walter, M.A., F.Z.S. (Vice-President) ... 4, Rosslyn Hill
Baker, F. H. ... ... ... ... 141, Haverstock Hill
Bakewell, H. J.... ... ... ... 60, South Hill Park
Bakewell, Miss M. ... ... ... 24, Nassington Road
Ball, E. ... ... ... ... ... 82, South Hill Park
Barratt, T. J. ... ... ... ... Bellmoor, Hampstead Heath
Bartlett, R. D. ... ... ... ... 45, Adelaide Road
Bartrum, C. O., B.Sc. ... ... ... 17, Denning Road (Member of Council)
Bartrum, Miss E. M. ... ... ... 96, Heath Street
Bartrum, Miss M. W. ... ... ... 96, Heath Street
Beach, Mrs. C. ... ... ... ... 11, Park Hill Road
Beckley, Mrs. E. M. ... ... ... 21, Rosslyn Hill

Blyth, E. K. ... ... ... ... 6, Rosslyn Hill
Blyth, Miss E. T. ... ... ... 6, Rosslyn Hill
Bond, Edward, M.A., M.P. ... ... Elm Bank, Windsor Terrace
(Vice-President)
Borrelly, M. ... ... ... ...
Boulting, William, L.R.C.P ... ... Guyon House, 98, Heath Street
Brand, Charles J. ... ... ... 27, Downside Cresent
Brand, Mrs. A. E. ... ... ... 27, Downside Crescent
Bridger, Miss N. ... ... ... 66, South Hill Park
Bright, Mrs. ... ... ... ... 16, Heath Mansions, The Grove
Browne, Mrs. ... ... ... ... Clifton Lodge, East Heath Road
Bryant, Mrs. Sophie, D.Sc. ... ... 6, Eldon Road
(Vice-President)
Bull, J. B. ... ... ... ... Elmleigh, Elm Row
Burt, Miss M. S. ... ... ... 6, Downshire Hill
Bushe-Fox, J. P. (Photographic Secretary) Ben Lomond House, Downshire Hill
Butcher, Arthur ... ... ... 66, Rosslyn Hill

Challen, Frank ... ... ... ... 20, West Hill, Highgate
Champneys, Mrs. ... ... ... Hall Oak, Frognal
Chandler, P. W. ... ... ... 5, Rosslyn Gardens
Channing, F.C., F.Z.S.... ... ... 62, Fellows Road
Chapman, Henry ... ... ... 21, Westbere Road, West Hampstead
Chegwidden, Ernest ... ... ... 45, Adelaide Road
Chinnock, Miss ... ... ... ... 4, Worsley Road
Clarke, Henry, J.P. ... ... ... Cannon Hall
Clarke, Miss ... ... ... ... 56, Antrim Street
Claudet, A. C. ... ... ... ... 27, Daleham Gardens
Clothier, Miss ... ... ... ... 26, Ellerdale Road
Coates, Joseph ... ... ... ... 13, Willoughby Road
Colles, W. M. Junr. ... ... ... 16, Birchington Rd., W. Hampstead
Cropper, J. C. ... ... ... ... 19, Arkwright Road
Crump, E. Compson (Hon. Treasurer) ... 28, High Street
Cuff, Miss ... ... ... ... 34, Lambolle Road
Cunnington, C. W., M.R.C.S., D.P.H. 86, West End Lane
(Member of Council)
Curwen, H. B. (Member of Council) ... Enfield House, Windmill Hill

D'Ambrumenil, B. ... ... ... 6, Gainsborough Gardens
Deacon, Rev. A. E., M.A. ... ... Christ Church Vicarage
Deedes, Rev. Brook, M.A. ... ... The Vicarage, Hampstead
Delf, Miss F. G. ... ... ... 90, Fitzjohn's Avenue
Dolman, George ... ... ... 82, High Street
Drake, H. O. ... ... ... ... 35, Heath Street
Drake, Miss ... ... ... ... 3, Inglewood House, W. Hampstead
Drake, Miss J. ... ... ... ... 3, Inglewood House, W. Hampstead

Drummond, J. C. ... ... ... 12, Worsley Road
Drummond, Mrs. ... ... ... 12, Worsley Road
Drysdale, Mrs. ... ... ... ... Wick Hall, Radley, Berks
Dudman, J., Junr. ... ... ... 56, Rosslyn Hill
Dunbar, J. ... ... ... ... 6, Pilgrims Lane

Edgeworth, Professor F. Y., M.A., D.C.L. (Vice-president) 5, Mount Vernon
Evans, Miss M.... ... ... ... 11, Ferncroft Avenue

Fairclough, Alfred N. ... ... ... 8, Dartmouth Road, Brondesbury
Faraday, Harold ... ... ... 15, Cannon Place
Faraday, Paul ... ... ... ... 15, Cannon Place
Farmer, A. J. ... ... ... ... 26, Nassington Road
Farnell, Miss E. ... ... ... Bayford House, Windsor Terrace
Fielder, Mrs. ... ... ... ... West Hill Lodge, Upper Frognal
Figgis, Samuel ... ... ... ... Montague Grove, Frognal
Findon, Hugh ... ... ... ... 58, Carleton Road, Tufnell Park, N.
Flight, W. C. ... ... .. ... Silvermere, Finchley Lane, Hendon
Flook, Walter ... ... ... ... Heathlea, Willow Road
Forbes, Mrs. ... ... ... ... Egremont, 16, Willoughby Road
Forster, R. H. ... ... ... ... Artillery Mansions, Victoria St., S.W.
Frodsham, G. W. ... ... ... 16, Kingdon Road, West Hampstead
Fulleylove, Christopher ... ... 21, Church Row

Gard, W. G. Snowdon, LL.B., F.G.S.... 20, Upper Park Road
Garlick, Miss ... ... ... ... 11, Well Road
Garnett, Richard, C.B., LL.D. ... 27, Tanza Road
Garnett, William, M.A., D.C.L. (Member of Council) ... The Wabe, Redington Road
Ghenry, M. E. J. ... ... ... 12, Cressy Road
Gillman, A. R., F.Z.S., M.B.O.U. ... 5, Fellows Road
Glanville, Miss ... ... ... ... 5, Belsize Park Gardens
Godden, William ... ... ... 38, Burrard Road, West Hampstead
Goldsmith, Philip B. ... ... ... 3, Downside Crescent
Goodchild, Herbert, M.B.O.U. ... 119, Gloucester Road, Regent's Park
Goodyer, L. R. ... ... ... ... 6, Canterbury Mansions, W. Hampstead
Graham, H. Howgrave ... ... ... 12, Willow Road
Gundry, Joseph ... ... ... 158, Adelaide Road
Gysi, Max ... ... ... ... 3, Pilgrim's Lane

Hailston, Harold ... ... ... 91, Adelaide Road
Hall, L. B. ... ... ... ... Ivy House, Hampstead Square
Hallowes, S. M. ... ... ... Heath Fern Lodge, Heathside
Hallowes, Vernon B. ... ... ... Heath Fern Lodge, Heathside
Hannam, Miss Florence ... ... 6, Belsize Terrace

| | |
|---|---|
| HARBEN, Sir HENRY, J.P., (Vice-President) | Seaford Lodge, Fellows Road |
| Harvey, S. Smith | 1, Marlborough Mansions, Cannon Hill |
| Hastie, Peter | 24, Park Hill Road |
| HAYNS, JOHN, F.Inst.J. (Member of Council) | Campbell Cottage, 20, John Street |
| Hemmingway, Walter | 291, Finchley Road |
| HEPBURN, JAMES (Member of Council) | Hampstead Lodge, Marlborough Hill, N.W. |
| Hoch, Benjamin | South Villa, Vale of Health |
| Hoch, Mrs. G. | South Villa, Vale of Health |
| Homfray, Mrs. G. | 16, Church Row |
| Homfray, Miss | 16, Church Row |
| Hopkins, A. E. | 35, Antrim Mansions |
| Hopson, Montagu, F., F.E.S. | 30, Thurlow Road |
| Hopson, Mrs. | 30, Thurlow Road |
| Hough, E. | 8, Eldon Road |
| Howard, George | St. Mary's, West Finchley |
| Hudson, Miss Constance | 22, Kemplay Road |
| Hunter, J. W. | 41, Lancaster Road, South Hampstead |
| Isles, Miss M.A. | 16, Elsworthy Road |
| Inglis, C. H. | 15, Downside Crescent |
| Jacoby, Martin, F.E.S. | 7, Hemstal Road, Hampstead |
| James, Leonard, M.A. | 8, Lyndhurst Road |
| James, Mrs. | 8, Lyndhurst Road |
| Jealous, Mrs. | 33, Pond Street |
| Jessop, Edward, M.R.C.S., L.R.C.P. | 81, Fitzjohn's Avenue |
| Jevons, Miss | Wedderburn Cottage, Wedderburn Road |
| Jevons, Miss H. W. | 19, Chesterford Gardens |
| Johnston, Mrs. Charles | 72, Fitzjohn's Avenue |
| Jones, A. D. | St. Aubyn's, The Vale |
| Jones, H. Sydney | 39, Heathurst Road |
| Jones, E. Vaughan | 9, Well Walk |
| Jones, V. Vaughan | 9, Well Walk |
| Jones, Miss H. Vaughan | 9, Well Walk |
| Joshua, Philip | 45, Belsize Avenue |
| Kearne, S. R. | 1, Lyndhurst Gardens |
| Kellow, F. C. | 80, Haverstock Hill |
| Kinder, Miss M. A. | 44, Willow Road |
| King, Arthur H. | Church House, Highgate, N. |
| King, Henry | Leverton House, Pond Street |
| King, Mrs. M. L. | 5, Willoughby Road |

Kinns, Rev. Samuel, Ph.D., F.R.A.S... 182, Haverstock Hill
Kirkman, Rev. Joshua, M.A. ... ... St. Stephen's Vicarage, Thurlow Rd.

Lister, Miss ... ... ... ... Upper Heath
Lown, H. F. ... ... ... ... 38, Netherhall Gardens
Lucey, H. C. ... ... ... ... 13, Willow Road
Lynn, Miss ... ... ... ... Grove Lodge, The Grove

Malcolm, W. F. ... ... ... Birnan House, Fitzjohn's Avenue
Mallam, W. A., M.R.C.S., L.R.C.P. ... 63, Rosslyn Hill
March, Miss M. ... ... ... 74, Park Hill Road
Marks, K. I., F.R.M.S. ... ... 9, Randolph Gardens, N.W.
Maroti, C. H. ... ... ... ... 22, Winchester Road, N.W.
Marshall, Alfred ... ... ... 29, Heathurst Road
Martin, Basil W., F.Z.S., M.B.O.U.... 17, Denning Road
(Hon. Secretary of the Society)
Martin, Miss F.... ... ... ... 3, Foley Avenue
Mayle, Sydney C. ... ... ... 70, High Street
Melliss, H. ... ... ... ... 30, Denning Road
Mellor, F. A. ... ... ... ... 62, Parliament Hill
Meredith, A. S.... ... ... ... 17, Buckingham Mansions, West End Lane, N.W.
Meredith, Mrs. ... ... ... ... 17, Buckingham Mansions, West End Lane, N.W.
Millar, Henry E. ... ... ... Heathdown, East Heath Road
Milne, F. G. ... ... ... ... 30, Mackeson Road
Milvain, Thomas, K.C., M.P. ... ... 17, Rutland Gate, S.W.
Money, C. J. ... ... ... ... 8a, Heath Street
Moore, Miss M. E. ... ... ... 5, Gayton Crescent
Moore, Mrs. Wm. ... ... ... 16, Denning Road
Moreno, Dr. Francisco P., C.M.Z.S. ... Rathcote, Pattison Road
Mullins, E. G. ... ... ... ... Ivy Mount, Arkwright Road
Murdoch, G. H. ... ... ... 31, Nassington Road

Neatby, E. A., M.D. ... ... ... 178, Haverstock Hill
Neville, E. G. ... ... ... ... 57, Gondar Gardens
Nicholson, C. S., F.L.S. ... ... 22, Crouch Hall Rd., Crouch End, N.
Nicholson, Miss M. E. ... ... ... 8, Hampstead Hill Mansions
Nunn, S. T. ... ... ... ... Mt. Ephraim, Minster Rd., Brondesbury
Nunn, T. W. ... ... ... ... Mt. Ephraim, Minster Rd., Brondesbury

Orr, Miss M. S.... ... ... ... 30, Heathurst Road

Paine, F. E. ... ... ... ... Hillfield, Haverstock Hill
Park, B. C. P. ... ... ... ... 19, Primrose Hill Road
Park, Mrs. ... ... ... ... 19, Primrose Hill Road

Park, D. F., F.Z.S. ... ... ... 24, Belsize Crescent
Pawling, Mrs. Sydney ... ... ... 55, Frognal
PAYNE, E. S. (Member of Council) ... 45, Rosslyn Hill
Peacock, W. Folds ... ... ... 31, Parliament Hill
Pearsall, H. D., M.Inst.C.E. ... ... 21, Parliament Hill
Pearse, D. C. ... ... ... ... 14, Willow Road
Perrins, Ronald... ... ... ... 1, Kemplay Road
PETRIE, Prof. W. M. FLINDERS, D.C.L., LL.D., Ph.D., F.R.S. (Vice-President) 8, Well Road
Petrie, Mrs. Flinders ... ... ... 8, Well Road
Phillips, E. B. ... ... ... ... 33, Finchley Road
Pidcock, G. D., M.A., M.D., M.R.C.P. 74, Fitzjohn's Avenue
Player, J. H. ... ... ... ... 16, Prince Arthur Road
Playne, Miss A. M. ... ... ... 27, Church Row
PODMORE, FRANK, M.A. (Vice-President) ... ... 6, Holly Place
Potter, G. W. ... ... ... ... 4, Gayton Crescent
Prance, R. H. ... ... ... ... 29, Netherhall Gardens
Price, W. ... ... ... ... 39, Courthope Road
Pridham, Miss ... ... ... ... 5, Squires Mount
Pridham, Miss A. J. ... ... ... 5, Squires Mount

Quekett, O. C. ... ... ... ... 70, Greencroft Gardens

Rabone, Alec ... ... ... ... Elm Lodge, Elm Row
Raisin, H. W. ... ... ... ... 41, Heathurst Road
Raisin, Mrs. ... ... ... ... 41, Heathurst Road
Raisin, W. F. ... ... ... ... 41, Heathurst Road
Rayner, Henry, M.D. ... ... ... Upper Terrace House
Rickett, W. R., J.P. ... ... ... Sunnyfield, West Heath
Ridley, Miss J.... ... ... ... 31, Daleham Gardens
Rising, W. T. ... ... ... ... 9, High Street
Roddick, J. R. ... ... ... ... 103, South Hill Park
Rodgers, H. J. ... ... ... ... Elm Lodge, Elm Row
Ross, Miss Louisa ... ... ... 53, Agamemnon Road
Rowney, W. G.... ... ... ... Noel House, Gainsborough Gardens
Rudler, F. W., F.G.S. ... ... ... 18, St. George's Road, Kilburn, N.W.
Rye, H. ... ... ... ... ... 9, Wentworth Mansions, John Street

Sabey, G. E. ... ... ... ... 29, Agamemnon Road, W. Hampstead
Sabey, Miss G. ... ... ... ... 44, Park Street, N.W.
Schooling, Mrs.... ... ... ... 9, Rona Road, Gospel Oak
SCHRÖDER, WALTER ... ... ... Telegraph Hill, West Heath (Member of Council)
Scott, Victor ... ... ... ... Bank House, Willesden Green

Sharman, Henry, M.D. ... ... Sedgemoor, Arkwright Road
Shenton, E. W. H., M.R.C.S., L.R.C.P. 7, Heath Mansions, The Grove
(Member of Council)
Shenton, Mrs. Edward... ... ... 7, Heath Mansions, The Grove
Simmons, C., M.A. ... ... ... The School, Holly Hill
Smith, John ... ... ... ... 8, King Henry's Road
Squier, Percy H. H. ... ... ... 35, Eresby Road, West Hampstead
Stevenson, Miss ... ... ... 2, Prince Arthur Road
Stokes, A. W., F.C.S., F.I.C. ... ... 60, Park Hill Road
(Member of Council)
Stokes, Mrs. ... ... ... ... 60, Park Hill Road
Stopes, Miss Marie C. C., B.Sc. ... 25, Denning Road
Strand, A. C., M.R.C.S., L.R.C.P. ... 34, Baker Street, W.
Strange, R. Gordon, M.B., B.S. ... 2, Belsize Avenue
Strange, Miss ... ... ... ... 2, Belsize Avenue
Swain, Edward (Member of Council) 5, Tanza Road

Taylor, E. Claude, M.D., F.R.C.S., M.S. Eland House, Rosslyn Hill
Tebb, A. E., M.D., B.S., D.P.H. ... 226, Finchley Road
(Member of Council)
Tebb, Mrs. A. E. ... ... ... 226, Finchley Road
Thomas, G. Danford, M.D., F.Z.S. ... 20, Brunswick Square, W.C.
Thompson, F. E., M.A. ... ... 16, Primrose Hill Road, N.W.
Thompson, A. Hugh, M.A., M.D. ... 26, Ellerdale Road
Thompson, Mrs. ... ... ... 26, Ellerdale Road
Thompson, Professor Silvanus P., D.Sc., Morland, Chislett Rd., W. Hampstead
F.R.S. (Vice-President)
Thorn, Miss E. S., B.A. ... ... 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss M.... ... ... ... 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss R. ... ... ... ... 16, Estelle Road, Gospel Oak, N.W.
Thornely, W. ... ... ... ... High Close, Holford Road
Thornely, Miss ... ... ... ... High Close, Holford Road
Thrower, Alfred ... ... ... 1, Chalcot Gardens
Turner, G. H. ... ... ... ... 35, Rosslyn Hill

Underdown, Herbert W. ... ... 22, Belsize Crescent
Underdown, Miss E. ... ... ... 22, Belsize Crescent

Venning, S. D. ... ... ... ... 172, Broadhurst Gardens
Viner, Miss F. A. ... ... ... 15, Thurlow Road
Vizard, P. E. (Vice-President and ... 3, Pilgrims Lane
Astronomical Secretary)
Vizard, W. G. ... ... ... ... 22, Downshire Hill

Wainwright, Shirley ... ... ... Elm Lodge, Elm Row
Walker, Rev. F. A., D.D., F.L.S., F.E.S. Dun Mallard, Shoot-up-Hill, N.W.

Wallis Ernest ... ... ... ... Lested Lodge, Well Walk
Wallis, Mrs. ... ... ... ... Lested Lodge, Well Walk
Ward, Lawrence ... ... ... 159, Broadhurst Gdns., W. Hampstead
Watkins, C. A. ... ... ... ... 77, Fitzjohns Avenue
Watts, P. A. ... ... ... ... 49, Goldhurst Terrace
Wells, Josiah ... ... ... ... 1, Arkwright Road
Wesley, James H. ... ... ... 81, Fairbridge Road, Upper Holloway
White, C. T. ... ... ... .. 17, Parolles Road, Upper Holloway
Whiting, James E. ... ... ... 41, Heath Street
Whittingham, C. J. ... ... ...
Wightman, Charles ... ... ... 43, Portland Place, W.
Wilkins, Miss ... ... ... ... 1, Ellerdale Road
WILKS, Sir SAMUEL, Bart, M.D., LL.D., F.R.S. (President) 8, Prince Arthur Road
Wilks, Mrs. ... ... ... ... 19, Denning Road
WILLIAMS, J. W., M.R.C.S., L.R.C.P., F.L.S., F.R.M.S. (Natural History Secretary) 128, Mansfield Road
Williams, P. H. ... ... ... 2, Osborne Mansions, Chapter Road Willesden Green
Willis, Herbert J. ... ... ... 26, Kemplay Road
WILSON, ARTHUR, B.A.... (Vice-President) ... ... Wyldes, North End
Winstanley, Mrs. L. M. ... ... 48, Upper Park Road
Withers, J. E. ... ... ... ... 1, Lawn Road
WOMACK, FREDK., M.B., B.Sc.... (Member of Council) ... 2, Greencroft Gardens
Woodman, H. W. ... ... ... 31, Carlingford Road
Woodward, Frank ... ... ... 10, Church Row
Wray, Cecil, F.G.S. ... ... ... 12, South Hill Park Gardens
Wray, Leonard, F.Z.S.... ... ... 56, Hillfield Road, West Hampstead
Wright, E. B. ... ... ... ... 13a, Gardner Road

Yeld, Miss M. ... ... ... ... 17, Platts Lane

# Hampstead Scientific Society.

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The following publications can still be obtained from the Publisher, Mr. S. C. Mayle, 70, High Street Hampstead:

| | |
|---|---|
| Report and Proceedings, | 1899—1900 |
| ditto. | 1901 |
| ditto. | 1902 |

Price 4d. each, post free.

"The Relation of Science to Art; in Reference to Taste and Beauty," by Sir Samuel Wilks, Bart., M.D., F.R.S. (The Lecture delivered before the Society on the 12th May, 1902). Price 7d., post free.

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Full particulars as to the Sections of the Society can be obtained from the respective Hon. Secretaries, and as to membership, etc., from the undersigned.

17, Denning Road, Hampstead.

Basil W. Martin,
*Hon. Secretary of the Society.*

# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY






1903

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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## With a List of the Members.

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*For the Year* 1903.

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PRICE THREEPENCE.

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HAMPSTEAD, N.W.
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THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

By the generous gift of Colonel Heberden, the Society is the possessor of a reflecting telescope of 10½ inch mirror, which is erected in a small observatory on the East Heath by permission of the London County Council. Particulars as to the use of the Telescope can be obtained of the Hon. Astronomical Secretary.

A General Meeting of the Society is held at the Hampstead Library, Prince Arthur Road, or at the Town Hall (Small Hall), on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 p.m. precisely. Meetings of the various Sections are also held regularly at the Hampstead Library.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, of having free access to the Telescope, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretary, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained of the undersigned.**

C. O. BARTRUM,
*Hon. Secretary of the Society,*
3, Holford Road,
Hampstead, N.W.

*February*, 1904.

# Hampstead Scientific Society.

## *List of Officers for the Year 1904.*

Elected at the Annual Meeting, February 5th, 1904.

**President.**

Sir SAMUEL WILKS, Bt., M.D., LL.D., F.R.S.

**Vice-Presidents.**

WALTER BAILY, M.A., F.Z.S.*
EDWARD BOND, M.A., M.P.
Mrs. SOPHIE BRYANT, D.Sc.
Prof. F. Y. EDGEWORTH, M.A., D.C.L.
Sir HENRY HARBEN, J.P.
Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.
FRANK PODMORE, M.A.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*)

GEORGE AVENELL.
C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS, F.I.J.
E. S. PAYNE.*
WALTER SCHRÖDER.
E. W. H. SHENTON, M.R.C.S., L.R.C.P.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.
F. WOMACK, M.B., B.Sc.

**Hon. Treasurer.***

E. COMPSON CRUMP,
L. & S.W. Bank, Ltd.
High Street, Hampstead.

**Hon. Secretary.***

C. O. BARTRUM, B.Sc.
3, Holford Road,
Hampstead.

**Assistant Secretary.**

D. C. PEARSE,
14, Willow Road,
Hampstead.

---

**ASTRONOMICAL SECTION:**

**Hon. Secretary.***

P. E. VIZARD, F.R.A.S.
3, Pilgrim's Lane.
Hampstead.

**PHOTOGRAPHIC SECTION:**

**Hon. Secretary.***

J. P. BUSHE-FOX.
Ben Lomond House,
Downshire Hill, Hampstead.

**NATURAL HISTORY SECTION:**

**Hon. Secretary.***

J. W. WILLIAMS, M.R.C.S., F.L.S.
128, Mansfield Road, N.W.

---

* *Executive Committee.*

# Report of the Council.

FOR THE YEAR 1903.

*Read at the Annual Meeting, February 5th, 1904.*

THE Council beg to report that 66 new members have been elected during the past year, and that, allowing for resignations and removals, the number of members now stands at 315, consisting of 223 gentlemen and 92 ladies; a total increase of 29 members since the last report.

The Council regret to record the loss by death of one of their number, Mr. James Hepburn, who has been a generous supporter of the Society since its foundation.

Early in the year the Council received with much regret a letter of resignation from the Honorary Secretary, Mr. Basil W. Martin, as he found that the large amount of work entailed was endangering his health. He was persuaded, however, to continue in the Honorary Secretaryship on the understanding that a paid Assistant Secretary should be appointed, who would relieve him of much of the clerical detail. Mr. D. C. Pearse has satisfactorily filled this position, which entails considerable labour.

In May Mr. Martin found himself again compelled to tender his resignation, as circumstances had arisen which required him to leave London. The Council accepted his resignation with very much regret. The following resolution was unanimously passed by the Council :—

> "The Council of the Hampstead Scientific Society receives with great regret the resignation of the Honorary Secretary, Mr. Basil W. Martin, and desires to record its cordial appreciation of the valuable services he has rendered to the Society in that capacity from the period of its formation some four years ago.
>
> "The Council fully recognises that it is largely due to his untiring efforts and able organisation, that the Society has reached its present satisfactory position."

A testimonial, consisting of an Illuminated Address and a Student's Microscope with a cheque for five guineas in lieu of a high power objective, was subscribed for by a large number of the members and presented to Mr. Martin. A water-colour painting of Wyldes, Hampstead Heath, by Mr. E. S. Eastment, was also generously contributed by Miss Constance Garlick.

At the Conversazione, held on November 6th, Mr. Basil W. Martin was unanimously elected an Honorary Member, on the recommendation of the Council.

The work since then has been carried on by Mr. C. O. Bartrum and Mr. J. P. Bushe-Fox, as joint Honorary Secretaries.

The Accounts of the Society have been duly audited for the twelve months ending December 31st, 1903. A statement of Receipts and Expenditure will be found on page 9. It is hoped that those members

who are able will contribute more than the minimum subscription, as five shillings does not cover the considerable expenditure entailed by the work of the Society and the Sections. The Hon. Treasurer gratefully reports that among the subscriptions there were: 2 at £2 2s., 9 at £1 1s., 4 at £1, 1 at 15/-, 16 at 10/6, 30 at 10/-, 9 at 7/6. As in former years, Dr. Williams has generously borne the expenses of printing and postage for the Natural History Section. The Council are indebted to the President, Sir Samuel Wilks, Bt., for his kindness in obtaining a number of special donations to the funds of the Society.

The total number of meetings held during 1903 has been thirty-nine, including five out-door meetings (see page 19). Abstracts of the papers read and the the proceedings at the meetings will be found accompanying this Report.

Mr. E. S. Payne attended the Congress of the South Eastern Union of Scientific Societies at Dover, as delegate of the Society, which is affiliated to the Union. The proceedings were of great interest. The Congress will meet this year at Maidstone, in June, under the presidency of Mr. F. W. Rudler, I.S.O., F.G.S., who is a member of the Hampstead Scientific Society.

In connection with the Astronomical Section, Mr. P. E. Vizard delivered a series of four lectures during February and March, and a further series of four lectures in November and December (see page 20). Several evenings were arranged for work with the Society's telescope, but in consequence of the unfavourable state of the weather, very few were available.

The Natural History Section, which has made considerable progress, has held seven meetings. Several original communications have been made, and the many exhibits have created much interest. Since the resignation of Mr. Martin the whole work of the Section has devolved upon Dr. Williams.

The Photographic Section has held twelve meetings during the year. The excellence of the work shown at the Annual Exhibition held in December testifies to the progress made by the Section. An interesting loan Exhibition was also held in May. The thanks of the Society are due to many well known photographers who were good enough to lend specimens of their work.

The Conversazione held at the Town Hall, on November 6th, to inaugurate the fifth Session, proved a great success, nearly three hundred persons being present. The address by Mr. Jonathan Hutchinson, M.D., LL.D., F.R.S., upon "Leprosy in Ancient and Modern Times," was a striking exposition of his views and greatly interested the audience. Dr. F. Womack devoted great pains and patience to explaining and demonstrating the properties of Radium.

# STATEMENT OF ACCOUNTS.

*For the Year ending 31st December, 1903.*

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1903 Subscriptions paid in 1902, brought forward .. | 20 | 3 | 6 |
| Subscriptions paid in, and for 1903 .. .. .. | 63 | 19 | 0 |
| Donations per Sir Samuel Wilks— | | | |
| Mr. T. J. Barratt .. .. .. 2 2 0 | | | |
| Miss James .. .. .. 5 0 0 | | | |
| Mr. D. Jones .. .. .. 1 0 0 | | | |
| Miss Martin .. .. .. 1 0 0 | | | |
| Mrs. Niles .. .. .. .. 2 2 0 | | | |
| | 11 | 4 | 0 |
| Donation—Mr. P. E. Vizard .. .. .. .. | 1 | 10 | 0 |
| Sale of Tickets Conversazione .. .. .. | 2 | 15 | 0 |
| Ditto. Lectures .. .. .. .. .. .. | 1 | 2 | 0 |
| Receipts in 1903 .. .. .. .. .. | 100 | 13 | 6 |
| Deficit on year 1902, brought forward 16 0 11 | | | |
| Deficit on 1903 .. .. .. .. 6 9 9 | | | |
| Present total Deficit due to Hon. Treas. 22 10 8 | 22 | 10 | 8 |
| | £123 | 4 | 2 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery .. .. .. .. | 15 | 2 | 0 |
| Rent Town Hall .. .. .. .. .. .. | 5 | 5 | 0 |
| Rent Stanfield House .. .. .. .. .. | 9 | 14 | 0 |
| Printing Report ... .. .. .. .. .. | 11 | 12 | 0 |
| Advertising Syllabus .. .. .. .. .. | 4 | 13 | 0 |
| Photographic Section .. .. .. .. .. | 10 | 5 | 0 |
| Royal Photographic Society .. .. .. .. | 1 | 1 | 0 |
| Conversazione .. .. .. .. .. .. | 12 | 17 | 7 |
| Operating Lantern, etc. .. .. .. .. | 2 | 5 | 6 |
| Telescope House, etc. .. .. .. .. .. | 1 | 10 | 0 |
| Sundry Expenses, per Hon. Secretary— | | | |
| Postages .. .. .. .. 12 10 7 | | | |
| Stationery .. .. .. .. 2 0 4 | | | |
| Lecturers' Expenses .. .. 2 11 4 | | | |
| Lantern .. .. .. .. 1 12 0 | | | |
| Field Nat. Subscription .. .. 0 10 0 | | | |
| Sundries .. .. .. .. 2 15 7 | | | |
| | 21 | 19 | 10 |
| Assistant Secretary .. .. .. .. .. | 10 | 0 | 0 |
| Cheques (100), stamps and postages for Subn. Receipts | 0 | 18 | 4 |
| Expenditure in 1903 .. .. .. .. .. | 107 | 3 | 3 |
| Deficit in 1902 brought forward .. .. .. | 16 | 0 | 11 |
| | £123 | 4 | 2 |

Subscriptions for 1904 paid in 1903, £11 8s. 0d.—In hand £11 8 0

E. COMPSON CRUMP, *Hon. Treasurer.*
*20th January, 1904.*

*Audited and found correct*, E. S. PAYNE,
WALTER SCHRÖDER.

# Abstract of Proceedings.

1903.

## General Meetings.

Friday, 2nd January. Sir Samuel Wilks, Bt., M.D., F.R.S., President, in the chair.

**Professor F. Y. Edgeworth, M.A., D.C.L.,** read a paper entitled "**Observations on Bees and Wasps.**" He remarked that the idea underlying the paper was to obtain from the observation of insect communities more perfect statistics than human society presents. When the statistician observes some attribute of man, *e.g.*, the death rate, before he has obtained returns enough to determine the average accurately the conditions have begun to change—sanitation perhaps has improved, or aggregation into towns has increased. Human society will not stand still to be measured. It is otherwise with those creatures whose evolution is very slow. The average time which a bee or wasp takes to gather a load of honey or other food is doubtless sensibly constant from age to age. The lecturer had found great differences in this average time according to the nature of the material from which a load was procured. Two or three minutes only would be required to take in a cargo of liquid honey, but half-an-hour or forty minutes might be required in the case of certain other kinds of food. If the proportion of workers employed on different tasks were constant we should expect that, though the several tasks occupied very different times, the average time spent by a

worker in collecting material would be constant. The measurement of this average time is blocked by the difficulty of marking an individual insect as it issues from the nest. The lecturer had triumphed over this difficulty, and invented methods of measuring the average duration of a wasp's (or bee's) absence from the nest without marking the individuals. One method, appropriate to the early morning or late evening, gave very consistent results—that the duration of a wasp's voyage at those periods of the day was from ten minutes to a quarter of an hour. The duration seemed rather shorter for hive bees and longer for humble bees. Another method proper to the central portions of the day, when a regular flow into and out of the nest had been set up, gave a different result. The average length of a wasp's voyage at midday periods proved to be more than half-an-hour. It should seem that the apportionment of tasks at different hours was not the same. In the course of his address the lecturer adverted to some curious habits of wasps, which he had noticed while collecting his statistics.

On Friday, February 6th, the Annual General Meeting was held under the presidency of Sir Samuel Wilks, Bt., F.R.S., the President. The Report of the Council was read and adopted. The President, Officers and Council were elected.

The meeting was resolved into an Ordinary Meeting. **Mr. Charles R. Darling. A.R.C.S., A.I.C.,** gave a lecture on **"Electrography, or the Photographic effects of Electricity"** illustrated with experiments. The lecturer explained that the name "Electrography" was applied to processes in which an image was obtained upon a suitable medium by passing an electric current from one conducting plate to another through the medium. When one plate is a coin and the other is zinc and a sheet of damp

paper is used as the medium, an image of the coin is formed upon the paper. This image becomes visible on treating the paper with nitrate of silver and hydroquinone. The undeveloped image will remain several weeks unimpaired. A suggested explanation of this effect is that metal from the zinc plate is carried by the current into the paper. It is then assumed to be capable of producing chemical changes, which result in the production of images when the paper is treated with suitable chemicals. Other suggested explanations are, the production of peroxide of hydrogen by the current, and the presence of an electric charge. But none of these explanations account for all the observed phenomena. When the paper is first treated with nitrate of silver and the current is afterwards passed, a deposit of the metal is obtained on the surface of the paper where there is contact. In this way by using printers' type, a perfect copy of the letters is formed. Printing may thus be performed by electricity without ink, 36,000 copies per hour being possible with suitable machinery. By treating the paper with different chemicals prints of different colours can be obtained.

Friday, March 6th. Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

**Mr. A. W. Stokes, F.C.S., F.I.C.,** gave a lecture on **"A Cup of Tea,"** which was illustrated with lantern slides. He pointed out that all nations, wild or civilized, had found it necessary to concoct drinks more stimulating than water. These may be of two kinds—fermented sugary solution or leaf or berry infusion. The former owe their stimulating effect to alcohol, the latter to alkaloids. Tea was discovered by the Chinese at a time so remote that they ascribe to it a supernatural origin. It first came to England about 1571, when it was sold for as much

as ten guineas per lb. Previously wine or beer was the only beverage for all meals. The method of preparing tea in China and Ceylon, the various forms —green, black and brick tea—and the various fashions of drinking it, were descanted upon. The lecturer explained the chemical constituents of tea, its adulterations, and their manner of detection. Famous tea drinkers were referred to, such as Dr. Johnson, whose teapot held half-a-gallon, as also its opponents, led by the great John Wesley.

Friday, April 3rd, Sir Samuel Wilks, Bt., F.R.S., President, in the chair.

**Dr. J. W. Anderson,** gave a lecture on "**How to determine Character from the Head and Face,**" illustrated by lantern slides. Dr. Anderson described a system of physiognomy for which he claimed the merit of being physiologically and psychologically defensible and which he had satisfied himself was true. It differed from phrenology in being founded upon faculties and not qualities. The shape of the head was determined by the relative development of different parts of the brain and from it could be gauged the degree of development of the functions located in the various parts. The blood supply to each part, together with hereditary tendency, determined the degree of development of that part. The lecturer described as the most perfect head one which formed a circle from the root of the nose to the protuberance at the back of the occiput, the centre of the circle being immediately in front of the ear—an equally developed head in every direction.

Friday, May 8th. Sir Samuel Wilks, Bt., F.R.S., President, in the chair.

**Professor W. M. Flinders Petrie, D.C.L., LL.D., F.R.S.,** gave a lecture entitled "**History before Writing**" illustrated with lantern slides.

Professor Petrie said he was anxious to give the audience an outline of the method whereby they were able to reach back to some definite and exact knowledge of the ages before those which had a written history. It might seem somewhat of a paradox to speak of history before writing because to most people history was written history, but he knew of no word which would express the fact that knowledge had been gained of history which was not written, and so he had fallen back on this title. He would remind them that it was possible to have a highly civilized people without the art of writing, and that the want of that art did not reflect on their civilization or entitle people of to-day to look upon them as savages. In the early times in Egypt—times which were before anything that could be called civilization—rude flint implements were used. These palæolithic flints had been found scattered over the desert and all over the Nile Valley, sometimes 10 feet below the surface in the Nile gravel, where they must have been deposited when the Nile filled the whole of the valley, long before the prehistoric period. He pointed this out as an instance of how much could be recovered of things bearing upon a period of which little or nothing was known. He had now definite proofs of three periods in the history of palæolithic man. In all probability Egypt was one of the last homes of palæolithic man. Relics of the earliest times showed that there were in Egypt two definite peoples—one of a long slender type, and the other of a type which was almost identical with the bushmen of the present day, and which might be called the Hottentot type. The continuous civilization of Egypt started about 7,000 B.C., and it must have been 2,000 years before that that those two types existed there. Both the palæolithic and the neolithic periods were long before the time of written history. He showed one of the earliest groups of people, some of whom were covered with goat skins,

and then went on to say that he had been able to restore the times of these early people by means of jars and vases found in prehistoric graves. On these vases pictures of which were shown, were figures of combs, rings, and figures of animals. By arranging the vases, many of which were of highly polished pottery, in series he had been able to trace the changes which went on, and to reduce the various series to something like an organized system. He had obtained records from 5,000 or 6,000 prehistoric graves, and had selected nearly 1,000 specimens from all parts of the country, upon which to base his calculations. He then divided these specimens into fifty different scales, representing as many different periods of activity, and thus showed how he had been able to restore the definite history of the people, and how, though changes occurred, there were links joining up the whole and eventually connecting the prehistoric with historic times. Some of the vases were of beautiful workmanship, and showed groups of people, animals and monstrosities. Other articles discovered included tiles and implements used in sport and war; and in one grave, that of a child, were found some little toys used in a game similar to skittles. The pictures of many-oared sea-going ships upon some of the vases, and pieces of pottery entirely foreign to Egypt, proved conclusively that the prehistoric people carried on a trade with other places in North Africa, and with the Greeks, the Venetians and the Spaniards. In conclusion Professor Petrie showed a picture of the earliest line of continuous writing—in characters known as hieroglyphics—of the time of Menes, and said that, with the aid of the records he had shown, supplemented by continuous writing, the continuous history of Egypt for nearly 7,000 years could be traced.

On Friday, November 6th, the General Meeting took the form of a Conversazione at the Town Hall

to inaugurate the Session 1903-4. **Mr. Jonathan Hutchinson, M.D. LL.D., F.R.S.,** gave an address on **"Leprosy in Ancient and Modern Times."** Sir Samuel Wilks, Bt., F.R.S., occupied the Chair.

The lecturer took as his text 2 Kings v. 1 :— "Now Naaman, captain of the host of the king of Syria, was a great man with his master, and honourable, . . . he was also a mighty man in valour, but he was a leper." He argued from this and from other evidence, that leprosy is an ancient disease, not confined to the poor, but incidental among all classes; that it is a fallacy to suppose it contagious in an ordinary way or communicable by the breath or by inoculation. Attendants upon lepers do not contract the disease except from the same causes that produced it in their patients. The leper houses that existed in England in the early centuries of the Christian era, and in medieval times, were not for the purpose of isolating a contagious disease, but as retreats for poor helpless creatures. They were privileged who were admitted to them, their friends were allowed to visit them, and they were removed in case of ill-behaviour. Compulsory confinement is unnecessary and cruel. Leprosy under careful and proper treatment is by no means incurable. A bacillus has been found in the diseased tissue which seems closely allied to that of tuberculosis.

The lecturer gave some striking evidence in favour of his view that leprosy results from the eating of badly cured fish. Its prevalence is most marked in fishing districts, and its incidence varies closely with the habits of the people as regards fish eating. Leprosy was most common in our country in the 11th century, when the Roman Church enforced for sixty or eighty days of the year the eating of fish, much of which was doubtless improperly cured. There was no leprosy in Russia, where the Greek

Church forbade fish as an alternative to meat on fast days. Leprosy has always been prevalent in Roman Catholic centres and disappears when the habit of fasting is discontinued. When better food is obtained the disease inevitably dies out.

**Dr. F. Womack** explained and demonstrated the properties of Radium. Exhibits were kindly lent by Prof. Flinders Petrie, F.R.S., Mr. Frank Podmore, by members of the North London Natural History Society and others. During the evening a selection of music was given by Misses Frances and Amabel Marshall, Miss Ada Stuart, Miss Ruth Sandham, Miss May Walker and Dr. Ronald Carter.

Friday, December 4th, 1903. Sir Samuel Wilks, Bt., F.R.S., President, in the Chair.

**Dr. J. G. Garson,** gave a lecture upon "**Finger Prints and their Use as a Means of Identification.**" He began by describing the two kinds of markings that exist on the palmar surface of the hand from before birth onwards. The first of these and the most noticeable are the lines of folding of the skin, most marked opposite the joints; but the most numerous are series of alternating ridges and furrows which are distributed over the whole surface of the hand, although more marked in certain parts of i than in others. On the tops of the ridges are situated the openings of the sweat glands, and under them the terminals of the nerves of touch are most numerously situated. They appear, therefore, to have a close relation to the sense of touch, and, from the roughened surface they produce, play an important function in improving the power of grasping objects which on a smooth surface would have a tendency to slip. They are most strongly developed on the hands of persons who do a moderate amount of manual labour. Hard labour and no labour at all tend to

diminish their prominence, as do also certain kinds of work, such as bricklaying. In children and women they are finer than in men, and they increase in size with the growth of the child. On the free terminal ends of the fingers they are well marked, and form certain definite patterns to which a good deal of attention has been given of late years, on account of the great facility they afford for establishing personal identity.

Dr. Garson gave a demonstration of the method whereby impressions are taken with printers' ink upon paper of the surface markings of the finger, a permanent print being so obtained.

The four different types into which the patterns thus obtained may be divided were shown by lantern slides, the lecturer showing in much detail how these types may be further subdivided into more than a thousand varieties for classificatory purposes.

Examples of prints taken at intervals of from nine to thirty-one years on different individuals, at different stages of life from childhood onwards, were shown on the screen indicating that the patterns retain their characteristics throughout life.

Dr. Garson alluded to the use of finger impressions in identifying the perpetrators of crime and showed a photograph of a typical record, as kept by the Police authorities at Scotland Yard, of criminals that come under their charge.

Other uses to which the principle might be applied were mentioned—the identification of pensioners, the prevention of fraudulent enlistment, the proving of title to property, and the establishment of identity for persons travelling abroad.

## Outdoor Meetings.

On Saturday, May 9th, a visit was made to the Generating Station and Works of the Central London Railway at Shepherd's Bush. The engineer of the Works conducted the party round.

On Saturday, June 20th, a party met at Northwood Station, for a ramble in that neighbourhood. Mr. James E. Whiting lead the party and assisted the members in identifying the many botanical specimens they met with. Tea was provided at "Ye Olde Greene Manne."

On Thursday, July 9th, by the kind permission of Lord Mansfield, a visit was paid to Ken Wood. The party met at 6 p.m. The weather proved superb. Mr. J. E. Whiting conducted the party through the wood. Mr. G. W. Potter gave a short history of the house and grounds.

On Thursday, July 23rd, an evening Ramble in Bishops Wood was arranged, with the permission of the Ecclesiastical Commissioners. The party met at 6 p.m., amid pouring rain, and were conducted by Mr. J. E. Whiting.

On Saturday, October 10th, a visit was paid to the Bird Galleries of the Natural History Museum, South Kensington. Mr. W. P. Pycraft gave an interesting discourse upon the specimens.

# Astronomical Section.

Mr. P. E. Vizard gave the two following Courses of Lectures :—

Thursday, February 5th.—"History of the Progress of Astronomy."

Early Notions; Astronomy of the Egyptians, Greeks, Hindus; Astronomy of the Bible; Crystalline Spheres; Cycles and Epicycles; Ancient Astronomers, Hipparchus, Ptolemy; Birth and Progress of Modern Astronomy; The Telescope; Copernicus; Tycho Brahé; Kepler; Galileo; Newton; etc.

Thursday, February 19th.—"Lunar Superstitions."

Superstitions about first seeing the New Moon; as to things done when the Moon is waxing or waning; as to the effect of Moonlight during sleep ("lunatic," "moonstruck" etc.); as to death occurring at the turn of the tide; belief that changes of the Moon affect the Weather; Moon lying on her back; the "April Moon"; belief that the Moon dissipates clouds; the "Man in the Moon"; Moon appearing larger when near the horizon, etc.

Thursday, March 5th.—"Celestial Measurements."

How Distances of Heavenly Bodies are Measured; Parallax; Velocity of Light; the Sun's Distance; various methods of calculation; transit of Venus; The Moon's distance; Distances of the Fixed Stars; How Sizes of Celestia Bodies are measured; How they are Weighed; How Positions of Heavenly Bodies are indicated; Declination and Right Ascension, etc.

Thursday, March 19th.—"The Sun."

What it is to the Earth; its Distance; Size; Weight; Rotation; Heat; Constitution; the Sun's Place among the "Stars"; its Movement in Space; Eclipse of the Sun; Theories as to the Sun's Future.

Thursday, November 12th.—"Man's Place in the Universe, as indicated by the New Astronomy."

A. R. Wallace's Theory that our Earth lies in the Centre of the Stellar Universe, and that Life exists only on the Earth; Points bearing on the Argument; Our Position with regard to the Milky Way; Is the Stellar Universe of Finite or Infinite extent?

Thursday, November 19th.—"Man's Place in the Universe" (continued).

Recapitulation of previous Lecture; Movements and Distance of Stars; Spectroscopic Results in Relation thereto; Planetary and Stellar Conditions for the Support of Life; Is it probable that we have a Monopoly of Life? Replies to Wallace by Professor Turner, Flammarion, Maunder, etc.; Brief reference to the Life and Work of A. R. Wallace.

Thursday, December 3rd.—"Time and its Measurements."

Instruments for Measuring Time; Sun-dials, Clocks and Watches; Divisions of Time (Day, Week, Month, Year) at Different Epochs and among Different Nations.

Thursday, December 10th.—"Time and its Measurements" (continued).

Recapitulation of previous Lecture; Sidereal, Solar and Mean Time; Equation of Time; Standard and Local Time; Effect on Time of Travelling East and West.

The unfavourable weather greatly interfered with the use of the Society's Telescope.

# Natural History Section.

Friday, 9th January, 1903. Sir Samuel Wilks, Bart., F.R.S., in the chair.

Mr. Walter Wesché, F.R.M.S., showed an interesting collection of Diptera, many of which were local specimens, being taken in his garden in Belsize Park Road. Mr. K. I. Marks, F.R.M.S., exhibited a "palpus" under the microscope which Mr. Wesché had recently discovered in the Diptera; this "palpus" was stated by the exhibitor to be a "vestigial structure." Sir Samuel Wilks, on behalf of Mrs. Allen, showed the eggs of a tortoise (*sp.* ?) which were laid in Mrs. Allen's garden; and he also exhibited a section of a plane tree which presented unequal growth, the side of lesser growth being due to want of air, sunshine and other accidents concomitant with the tree being planted against a wall. A series of Southern and Tropical cones was shown by Mr. Hugh Findon, and he raised the question of the cause of their diverse markings. Dr. J. W. Williams, F.L.S., stated that this was due to the special placing in special ways of the pigment secreting cells at the edge of the mantle, a special placing which would and does vary with the species. Dr. J. W. Williams exhibited the Rosy Feather Star *(Antedon* vel *Comatula rosacea)* and its pentacrinoid form, and made some observations on its structure and life history. The Crinoidea, he remarked, were a decadent class. Palæontologically speaking with few exceptions (as *Marsupites*) they were throughout their whole life stalked, whereas the majority of species now living were not stalked but free swimming in the adult stage, though stalked in the larval or pentacrinoid stage. This was a good illustration of Hæckel's "fundamental biogenetic law" that "the development of the individual is an epitome of the

development of the race." The decadence of this class was illustrated by the fact that, taking into a large account the "imperfection of the geological record," 200 genera with 1,500 species are known from the rocks, while those known to be now living belong to 12 genera and 400 species.

Mr. J. E. Whiting then read an interesting paper (illustrated with exhibits) entitled **"Twenty years of Hampstead; being observations of a Field Naturalist."** His paper dealt entirely with the avifauna of the district and he reviewed what had come under his notice of the haunts and habits (nest-building and otherwise) of the birds he had seen in the immediate neighbourhood.

Friday, 13th February, 1903. Sir Samuel Wilks, Bart., F.R.S., in the chair.

The following exhibits were placed upon the table and commented upon by the several exhibitors:—Stone Implements from the Federated Malay States, by Mr. Cecil Wray, F.G.S.; Stone Axes from New Guinea, by Sir Samuel Wilks; a series of Death-heads and Hawk Moths, by Mr. Martin Jacoby, F.E.S.; a series of Belemnites and some recent dibranchiate cephalopoda, by Mr. Hugh Findon; some British snakes and South African snake skins, by Mr. L. B. Hall, F.L.S.; a T.S. of the stem of *Cyperus longus*, by Mr. K. I. Marks, F.R.M.S.; and a L.S. of the eye of the fresh-water crayfish *(Astacus fluviatilis)*, by Dr. J. W. Williams, F.L.S., F.R.M.S.

Mr. Martin Jacoby, F.E.S., read a paper on **"The Study of Entomology and its Pleasures,"** dealing with his subject mainly from its educational value in cultivating powers of observation and deduction. He pointed out that the study of the life-histories of insects,

especially those of foreign ones, was still in its infancy, and that greater value was attached to this branch of entomology than to species naming; that the study of the bionomics of these creatures required great perseverance, often under trying climatic conditions, since many were nocturnal in habit and spent their lives as larvæ under different environmental conditions to what they did as perfect insects. He also stated that our ideas as to what constituted a genus and a species were far from settled; what one would consider a species, another would class as a variety. The great advantage to be derived from the study of any branch of natural history, and in particular that of entomology, was discussed by Mr. Jacoby at length, and he concluded by saying that everyone, even the merest amateur, would find an endless source of interest and pleasure if he tried to make himself an entomologist.

Friday, 13th March, 1903. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

The following exhibits were shown :—" A British Wild Cat," by Mr. Wilfred Mark Webb, F.L.S.; Malay Silver Work and Ornaments worn by Sakai men and women, by Mr. Cecil Wray, F.G.S.; a T.S. of the young stem of *Clematis japonica*, by Mr. K. I. Marks, F.R.M.S.; photographs showing the development of *Anosia erippus* after emergence from pupa, and also a specimen of *Orgyria gonostigma*, and some specimens of its common ally *O. antiqua* for contrast, by Mr. Montagu F. Hopson, F.L.S.; and *Obelia geniculata*, a hydroid zoophyte, by Dr. J. W. Williams, F.L.S.

The cat exhibited by Mr. Webb came not from Henley-on-Thames, as reported in the local press, but from Inverness. Dr. Williams and Mr. Martin maintained, owing to the absence of black spots on the forehead, the whiteness of the claws, and especially the great length of the tail as compared with the rest of

the body, that it was not a true Wild Cat (*Felis catus*), but a "reverted Tabby."

A paper on **"Fossil Hunting"** (illustrated with exhibits) was read by Mr. Hugh Findon. After claiming for this pursuit a place equal, if not superior, to other holiday occupations, Mr. Findon proceeded to describe the outfit necessary for collecting specimens, viz., a small sledge-hammer, a cold chisel, a pocket trowel, a satchel, tin boxes, and a geologically coloured map of the district. He then enumerated the following maxims to be borne in mind when out collecting:—1. Search always and everywhere. 2. Never go anywhere without some implement of some sort. 3. See that your tools are made of the best of everything, or they will fail you in time of need. 4. When exploiting the seashore keep an open way of retreat in case of emergency. Mr. Findon, with regard to the third maxim, gave a useful caution against "cheap" tools, but said that, nevertheless, it is not necessary to pay an enormous sum for a geological outfit if bought at an ordinary tool shop. The hammer which he carried with him on these occasions was a two-pound solid steel sledge, costing two shillings. The handle was a piece of American hickory, which is one of the toughest woods known—price, threepence. This must be accurately fitted to the head and wedged with a metal wedge. The other end was bound with wire, and was used to hit the fossils themselves when necessary. The chisel was much safer to use than a hammer blade, and it was best to get a second-hand one, as one could then see how it stands to the work. Having found one of well-tempered steel, sharpen it always on a grindstone, and keep it out of the hands of a blacksmith. Some fine fossils from the Lias of Whitby were then exhibited. Then, describing the Oolite, some beds of which are so remarkably fossiliferous as to be ninety per cent. so composed, Mr.

Findon showed fossils of that period. The Cretaceous rocks were then mentioned, and specimens from these strata, obtained in parts of Kent and Yorkshire, were shown. The Tertiary formations then claimed Mr. Findon's attention in the upward grade towards the present age. He observed that the fossils found in these beds were exceedingly perishable, and that they required treatment with some preservative before they were placed in the cabinet collection. This part of the paper was illustrated by shells from the Thanet sands, the Barton clay, the fluvio-marine beds of the Isle of Wight, and the Red Crag at Walton-on-the Naze. Mr. Findon concluded with offers of assistance to any intending fossil hunters.

Friday, 17th April, 1903. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Dr. J. W. Williams, F.L.S., F.R.M.S., gave a lecture (illustrated with lantern slides) on **"Plant-like Animals"** (Hydroid Zoophytes), and commenced by drawing attention to the probable way life first began upon the earth as a colloid material developed from inorganic materials. He stated that this primitive colloid living stuff fed for some ages on the inorganic material out of which it was formed, and then some of it began to feed upon itself, and it was from this latter that the animal kingdom had developed. Reference was made to the structure and life-history of Amœba, and the audience were then taken through Actinosphærium and Volvox to the multi-cellular animals. Dr. Williams showed how, if an animal like Volvox had dimpled in at one pole, there would arise a double-layered sac with a primitive mouth and a primitive digestive cavity. An organism like that formed the hypothetical group called by Hæckel the Gastreadæ, and it was probably from such creatures that the whole of the multi-cellular animals had evolved.

Some of these remained in their primitive condition and developed into hydroid zoophytes; the others went further and became primitive worms, and from these latter the whole of the Metazoa (including man) arose. The structure of Hydra was then fully described, and it was shown how a creature like Hydra could, by continuous budding, develop into a typical zoophyte, such as *Obelia geniculata*. This last was explained in detail, and reference was made to the manner in which small, free-swimming jelly-fish (medusæ) arose from the sides of the reproductive zooids of the hydroid colony, and how in near relation to the radial canals of these medusæ the reproductive elements developed and afterwards gave rise to the adult form. Reference was then made to the structure of other zoophytes, such as *Bougainvillea ramosa*, *Corymorpha nutans*, *Tubularia indivisa*, *Eudendrium ramosum*, *Cordylophora lacustris* (a fresh-water species), *Myriothelia phrygia*, *Syncoryne eximia*, *Hydractinia echinata* and *Clavatella prolifera*.

Friday, 15th May, 1903. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Mr. Basil W. Martin, F.Z.S., gave a lecture on **"Birds; their History and Structure,"** illustrated with lantern slides, many of which were lent by the Society for the protection of Birds. After defining the characteristics of birds, and how they differ from other animals, the lecturer traced the connection between birds and reptiles, and showed how, during the course of evolution, birds had been derived from reptiles. The skeleton of a bird was next described, and the more important features detailed, such as the skull with the lower jaw composed of several separate bones instead of only one as in mammals; the breast-bone, or sternum, to which the muscles which raise and depress the wings are attached, and which in

birds that have great powers of flight have a prominent middle ridge or keel. The bones of the wing were compared with those of other animals, including man, and it was shown how these bones had been adapted to their particular use in the various groups of animals. Mr. Martin then went on to describe the structure and development of feathers, and showed that they are essentially the same as hair, scales, and nails. He touched on such points as the bony ring round the eye, which enables the sight to be adjusted automatically; the nictitating or winking membrane for clearing the surface of the eye of dust, a rudiment of which is still to be found in the inner corner of the human eye; the beak and its adaptation to the various kinds of food of birds; and the development of the embryo within the egg. The last part of the lecture was devoted to describing the different orders into which birds are divided, a British bird being taken as a type in each case, and the principal points of its life-history, etc., detailed. At the conclusion of his lecture, Mr. Martin referred to the excellent work being done by the Society for the Protection of Birds, a work which all bird-lovers should support.

Friday, 13th November, 1903. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

Dr. J. W. Williams, F.L.S., exhibited the Ammonite (*Ammonites bifrons*), a common Whitby fossil, reported to have been found in the Tube boring in Heath Street, and pronounced it "a fraud." He gave many reasons for the belief that at a very recent date it had been in an aquarium, and, apart from that, stated that it was impossible for any Ammonite to be found in its natural place in the formations of Hampstead Hill. Hampstead Hill, he explained, was composed of London clay, capped by a thin layer of Bagshot sand, and resting upon a layer of rocks, known

as the Lower London Tertiaries. In none of these rocks had an Ammonite ever been found. The last Ammonite disappeared with the Cretaceous period. It had been suggested that this special Ammonite was a "derived fossil," and brought there by the glacial drift. That theory was at once shown to be erroneous by the scratchings on the fossil, which were circular, and not longitudinal or even oblique. It was not a case of ice-grinding at all, but of recent grinding upon a grindstone. There was little doubt that it had been taken down into the boring in a workman's pocket. then purposely imbedded in some of the blue clay and foisted upon the public.

Mr. Frank P. Smith gave a lecture on **"The Infinitely Little"** (illustrated with lantern slides). In his introductory remarks, the lecturer stated, that perhaps, a more fitting title would have been, "A Trip to the Infinitely Little," for he intended to begin with the consideration of objects of large size. In order to convey to the audience a perfectly clear idea of the relative size of the objects which he wished to exhibit, he commenced with a few coloured examples of well-known insects, molluscs and birds' eggs. These, he stated, were photographed approximately life-size upon the slides. A series of objects was then shown with magnifications ranging from eight diameters upwards. A number of parasites were passed rapidly through the lantern, and also a selection of parts of well-known insects. A short account was given of the method employed by the larva of the ant-lion in capturing its prey, illustrated by a photograph of the head of the insect in question. This creature marks out a ring on a loose sandy soil, and then removes the earth within its area, forming a funnel-shaped depression. At the bottom of this pit, it buries itself, leaving little but its jaws exposed. Unwary and over-curious ants soon begin to investigate this death-trap, and

their explorations are abruptly terminated by a sand-grain hurled adroitly, with almost unerring aim, by the hidden watcher below. They roll, surprised and stunned, to the bottom of the funnel, where a pair of fearful jaws are awaiting to receive them.

The magnification was now increased, and two series of objects were shown—"Pond Life" and "Spider Faces." The former consisted of a number of well-known forms of the smaller inhabitants of ponds and ditches, the lantern slides being of course prepared from drawings. The "spider faces" apparently came somewhat as a surprise to the audience, as nothing like them had been previously seen. Photographed in their natural colours and faithfully reproducing the most hideous expressions of mingled surprise, cunning, and brutality, their appearance was almost horrifying; and the more nervous members of the audience were by no means re-assured by the lecturer's statement that several of the most ferocious of the spiders were very common in the Hampstead district. The final series of slides, might well have been termed a "rush" to the "Infinitely Little," for within the space of a few minutes, the audience were taken from the comprehensible to the incomprehensible. A slide was shown of a filamentous marine alga (*Polysiphonia fastigata*) considerably magnified, and upon it was a small black spot. The magnification was then increased so that this spot filled the entire field of view, and under these conditions, the bacillus of anthrax was shown. A diatom (*Licmophora*) was exhibited during growth, and its minute size explained, the exquisitely marked siliceous skeletons of this and other members of the diatomaceæ, being then exhibited under increasing magnification. Aulacodiscus and Arachnoidiscus were enlarged to fill the entire field of view, and finally, a tiny fragment of a far smaller and delicately marked diatom (*Pleurosigma*

*Angulatum*) was shown, the actual size of the dots which appeared as large pennies upon the screen, being quite beyond conception.

Friday, 11th, December, 1903. Sir Samuel Wilks, Bart., F.R.S., in the Chair.

The following exhibits were laid upon the table and commented upon by the several exhibitors:—fossil sponges, by Mrs. Park; a collection of fresh-water mussels (*Unionidæ*), some being from a Highgate Pond, by Mr. Hugh Findon; propagative buds on the leaf of a moss (*Orthotrichum lyelli*), by Mr. L. B. Hall, F.L.S.; and an Ascidian (*Distaplia magnilarva*), by Dr. J. W. Williams.

Mr. A. W. Stokes, F.I.C., F.C.S., gave a demonstration on **"A Rapid Method of Dry-Mounting."** About nine-tenths of the objects supposed to be mounted dry, he stated, are found, in the course of time, to have the lower surface of their inclosing cover-glass bedewed with spherules of moisture or with minute crystals. Occasionally, the object itself is overgrown with fungus also. In mounting an object, a cell of some kind is usually needed. This may be formed of a ring of cement, paper, glass, vulcanite, or tin. In fastening this ring on to the glass slip, or in fixing the cover-glass, some cement must be used. Such cements are usually made liquid by water, alcohol, or turpentine. It is quite impossible, if any of these liquid cements are used to fasten down the cover-glass, for the cell to be a dry cell, since the liquid must dry into as well as outside of the cell. Mr. Stokes takes a mixture of equal parts of paraffin wax and bees' wax; a piece the size of a pea is placed on a glass or metal slip. This is heated till it melts and forms a thin film; in contact with this are placed the rings intended to form the cells. First one side, then the other side of the rings, is brought in contact with

the melted wax. The rings are taken off, and in a second or two the adherent wax is cold and hard. One of these rings is placed on a clean glass slip in the position desired, and heat applied below the slip till the waxed surface of the ring melts and adheres. It is now allowed to cool. The object, meanwhile, is dried in a desiccator over sulphuric acid or calcic chloride. It is then placed in the cell and fastened in position by a minute fragment of wax. Gum will not do for fixing the object, since, if really dry, it will not adhere at all. A cover-glass is now taken, one side cleaned and heated, and while still hot it is placed on the top of the cell. The top surface having already, as described, been covered with wax, the glass at once adheres, and the object is dry-mounted permanently. There is no liquid to sweat, and no time wasted in waiting for the cell to dry. So strongly does the mixture of waxes adhere, that it is not easy, without applying heat, to detach either cell or cover-glass. Cells can be made of tissue-paper if needed, or any of the ordinary rings will do. Vulcanite cells are preferable. Examples of old methods were exhibited, and numerous slides were shown, under a microscope, electrically lighted, to illustrate the adaptability of this method to such objects as Crustaceans, Crystals, Foraminifera, Polycistinæ, seeds, leaf-surfaces, etc.

## Photographic Section.

COMMITTEE FOR 1904:

H. J. Aubrey, Miss Blyth, H. B. Curwen, Miss Hannam, J. R. Roddick, J. P. Bushe-Fox, (Hon. Secretary).

A large number of new members have joined this Section during the past year, amongst them being

several well-known photographers. The year has been marked by the increased interest shown in the work of the Section which has maintained a high standard of excellence, and the average attendance at the fortnightly meetings has greatly increased.

The following were the meetings held during the past season :—

1903.

Wed. Jan. 14.—"The Wonders of Photography," Illustrated with Slides by Mr. Snowden Ward.

Fri. 23.—Demonstration on the Ozotype Process, by Mr. J. Manly.

Wed. Feb. 11.—"Negative making." Illustrated with Slides, by Mr. Chapman Jones, F.R.P.S.

Fri. 27.—The Bromide Process, demonstrated by Kodak, Ltd.

Wed. Mar. 11.—Members' Lantern Night.

Fri. 27.—Röntgen Ray Photography. Dr. Edward W. H. Shenton, M.R.C.S., L.R.C.P.

Wed. April 3.—Methods of Control in Photographic Printing. Illustrated with Slides, by Mr. G. J. T. Walford.

Fri. 24.—"The After Supper Photographer." Mr. W. Hemingway.

Fri. May 22.—Conversazione. Loan Collection of Photographs.

Wed. Nov. 11.—Demonstration on the Carbon Process, by The Autotype Co.

„ 25.—"Exposure and Development," Illustrated with Slides, by the Rev. F. C. Lambert, M.A.

Dec. 18, 19.—Annual Exhibition.

The thanks of the Section are especially due to the Demonstrators who have so ably shown the different processes in which they are experts.

One of the most enjoyable evenings was the Members' Lantern Night, when about 60 slides were entered for competition, the prize being awarded to Mr. J. P. Bushe-Fox for a study of sheep on the Sussex Downs.

A Conversazione and Loan Exhibition of Photographs was held on May 22nd. The pictures which were kindly lent by many of the leading artists in the Photographic world formed an exhibition of exceptional value. Many of the exhibits had previously won medals at exhibitions in different parts of the country.

The Annual Exhibition of Members' work held on Dec. 18th, and 19th, showed considerable progress when compared with the exhibitions of former years; the majority of the pictures being much above the average.

The Judge, Mr. J. T. Ashby, F.R.P.S., made the following awards. Landscape Section, 1st, Mr. J. P. Bushe-Fox; 2nd, Mr. H. B. Curwen; 3rd, Mr. R. H. Prance.—Portraiture Section, 1st, Mr. C. P. Small; 2nd, Mr. H. J. Aubrey; 3rd, Mr. H. Nevil Smart.—Architecture Section, 1st, Mr. H. B. Curwen; 2nd, Mr. J. R. Roddick.—Non-Enlargement Section, 1st, Mr. Victor Scott; 2nd, Miss E. Heath.

The Society's Silver medal was awarded to Mr. J. P. Bushe-Fox for his picture "Ebb Tide," Mr. J. T. Ashby declaring it to be highly pictorial in feeling and of fine technical quality. The Bronze medal went to Mr. C. P. Small for an excellent portrait study, while a certificate was given to Mr. Denman Jones for a beautiful photograph of a swan.

During the year a special fund was started to help defray the many incidental expenses incurred by this Section. The receipts up to Dec. 31st, 1903, were £6 16*s*., the expenditure being £6 2*s*. 2*d*., leaving a balance of £0 13*s*. 10*d*. It is hoped that all members interested in this Section will contribute to this fund as the expenses are extremely heavy.

# Hampstead Scientific Society.

## Rules.

*As amended and approved at the Annual Meeting, February 5th, 1904.*

1. The Society shall be called the "HAMPSTEAD SCIENTIFIC SOCIETY," and shall have for its objects the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science.

2. The Society shall consist of ordinary members, ladies and gentlemen, who shall pay a minimum Annual Subscription of Five Shillings, and of Honorary Members. All Subscriptions shall be due on the 1st January in each year.

3. The Officers of the Society shall consist of a President, Vice-Presidents, Honorary Secretary and Honorary Treasurer, and a Council of Members not exceeding fifteen, including the Honorary Secretaries of Sections.

4. The President, Officers, and Council shall be elected annually. The Council shall have power to fill up any vacancy that may occur among the Officers and Council pending the Annual General Meeting.

5. The business of the Society shall be conducted by the Officers and Council in general Committee, five to form a quorum. The Council may appoint an Executive Committee for the purpose of transacting and arranging details in connection with the general work of the Society. The Executive Committee to consist of not less than seven, of whom the Honorary Treasurer, Honorary Secretary, and Sectional Honorary Secretaries shall be *ex officio* members. The Council of the Society shall meet not less than twice in each year.

6. The Council shall prepare, and cause to be read at the Annual Meeting of Members, a Report on the affairs of the Society for the preceding year.

7. Two auditors shall be elected annually, who shall audit the Treasurer's Accounts, and the Treasurer shall produce a Balance Sheet and Statement of Accounts at the Annual Meeting.

8. Candidates for membership shall be proposed by an existing member, and seconded by one or more members. The election of members may take place at any ordinary meeting of the Society, the voting to be by show of hands, or by ballot; and when a majority of members present are in favour of the candidate he or she shall be duly elected.

9. No new member shall be entitled to any of the privileges of the Society until the Subscription for the current year shall have been paid.

10. Each member shall have the right of being present, and to vote, at all general meetings of the Society, and to propose candidates for membership. Each member shall also have the privilege of introducing two visitors to the ordinary and field meetings of the Society, except when otherwise arranged by the Council.

11. No member shall have the right of voting, or be entitled to any of the advantages of the Society if his or her subscription shall be twelve months in arrears. If any member's subscription shall be in arrears for two years the Council shall have the power, in its discretion, to remove his or her name from the list of members.

12. The Annual General Meeting shall be held during the first three months of the year for the election, or re-election, of Officers for the year ensuing, to receive the Reports, and to transact any other business.

13. The Ordinary Meetings of the Society shall be held on the first Friday in the months of November, December, January, February, March, April, and May, or at such other date, and at such place, as may be determined by the Council.

14. At the written request to the Secretary of not less than ten members a Special Meeting may be summoned, and no other business may be transacted but that which was stated on the notice convening the meeting. Ten days' notice in writing shall be given by the Secretary to each member of the Society, such notice to contain a copy of the requisition.

15. The telescope, and any instruments, books, slides, &c., in the possession of the Society shall be made available for members' use under such regulations as the Council may direct.

16. The Council shall have the power to recommend to the members any gentleman or lady, not a member of the Society, who may have contributed scientific papers, or otherwise benefited the Society, to be elected an Honorary Member ; such election to be by show of hands.

17. Separate Sections of the Society may be formed, at the discretion of the Council, for the purpose of carrying on work in particular branches of Science. The Honorary Secretary of each Section shall be an *ex officio* member of the Council and Executive Committee.

18. No alteration or addition to these Rules shall be made except at the Annual General Meeting, or at a meeting specially convened for the purpose. Notice of any such proposed alteration shall be given to the Secretary at least fourteen days before the Annual Meeting.

# List of Members.

***Corrected to March 4th, 1904.***

**Members are particularly requested to notify any change of address to the Hon. Secretary of the Society, 3, Holford Road, Hampstead, N.W.**

## Honorary Members.

Dawkins, Prof., W. Boyd, M.A., Owen's College, Manchester
D.Sc., F.R.S.
Heberden, Colonel Henry, R.A., J.P., 28, Buckland Crescent, Hampstead
Jermyn, F. Lubbock .. .. 10, Montpelier Crescent
Martin, Basil, W., F.Z.S. .. .. Darley Abbey, near Derby

## Ordinary Members.

Abbott, Rev. E. A., D.D. .. Well Side, Well Walk
Acret, Charles, F.R.G.S. .. .. 43, Rosslyn Hill
Adams, Thomas .. .. .. 3, Christchurch Road
Adams, W. Coode, M.B. .. .. 1, Eton Avenue
Alcock, S. P. .. .. .. 5, Rudall Crescent
Allcock, Miss N. .. .. .. 20, Shirlock Road, Gospel Oak
Allen, A. Jukes .. .. .. 17, Well Walk
Ambrose, Lawrence .. .. Westover, West Heath
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Anderson, J. W., M.D. .. .. Fawley House, Fawley Road
Andrews, E. Collingwood, M.A., 110, Finchley Road
M.D.
Ashworth, Percy H. .. .. 30, Heathurst Road
Aubrey, Hampton J. .. .. 3, Fawley Road, West Hampstead
Avenell, George .. .. .. 56, Mansfield Road
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Baily, Walter, M.A., F.Z.S. .. 4, Rosslyn Hill
(Vice-President)
Baker, F. H. .. .. .. 141, Haverstock Hill
Bakewell, H. J. .. .. .. 60, South Hill Park
Barratt, T. J. .. .. .. Bellmoor, Hampstead Heath
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(Hon. Secretary of the Society)
Bartrum, Miss E. M. .. .. 3, Holford Road
Bartrum, Miss M. W. .. .. 3, Holford Road

Batley, H. Gurson .. .. .. 21, Fellows Road
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Beckley, Mrs. E. M. .. .. 21, Rosslyn Hill
Beves, Mrs. H. C. .. .. .. 8, Holly Village, Highgate
Bird, Miss Alice .. .. .. 6, Windmill Hill
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Blyth, Miss E. T. .. .. .. 6, Rosslyn Hill
Bond, Edward, M.A., M.P. .. Elm Bank, Windsor Terrace
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Boulting, William, L.R.C.P. .. Guyon House, 98, Heath Street
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(Photographic Secretary) .. Hill
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Chandler, L. Francis .. .. 80, South Hill Park
Chandler, M. Howard .. .. 80, South Hill Park
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Cooke, A. Clement .. .. .. 9, Minster Road, West Hampstead
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(Member of Council)
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Deedes, Rev. Brook, M.A. .. The Vicarage, Hampstead
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Drake, H. O. .. .. .. 14, Circus Road, St. John's Wood
Drake, Miss .. .. .. .. 3, Inglewood House, West Hampstead
Drake, Miss J. .. .. .. 3, Inglewood House, West Hampstead
Drummond, J. C. .. .. .. 12, Worsley Road
Drummond, Mrs. .. .. .. 12, Worsley Road
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Dudman, G. Henderson .. .. 8, Upper Belsize Terrace
Dunbar, J. .. .. .. .. 6, Pilgrims Lane

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Faraday, Harold .. .. .. 8, Oak Hill Park, Frognal
Fielder, Mrs. .. .. .. 6, Fellows Road
Figgis, Samuel .. .. .. Montague Grove, Frognal
Findon, Hugh .. .. .. 58, Carleton Road, Tufnell Park, N.
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Flook, Walter .. .. .. Heathlea, Willow Road
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Forster, R. H. .. .. .. Artillery Mansions, Victoria St., S.W.
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Fulleylove, Christopher .. .. 21, Church Row

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Garlick, Miss .. .. .. 11, Well Road
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Godfrey, H. William .. .. 5, Greencroft Gardens
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Graham, H. Howgrave .. .. 12, Willow Road
Gray, Mrs. .. .. .. .. 3, Well Walk
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Gundry, Joseph .. .. .. 158, Adelaide Road
Gysi, Max .. .. .. .. Belsize Lodge, Belsize Lane

Hailston, Harold .. .. .. 91, Adelaide Road
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Hallowes, V. B. .. .. .. Heath Fern Lodge, Heath Side
Hannam, Miss Florence .. .. 6, Belsize Terrace
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Homfray, Miss .. .. .. 16, Church Row
Hopkins, A. E. .. .. .. 35, Antrim Mansions
Hopson, Montagu F., F.E.S. .. 30, Thurlow Road
Hopson, Mrs. .. .. .. 30, Thurlow Road
Hough, E. .. .. .. .. 8, Eldon Road
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Hudson, Miss Constance .. .. 22, Kemplay Road
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Inglis, C. H. .. .. .. 15, Downside Crescent

James, Leonard, M.A. .. .. 8, Lyndhurst Road
James, Mrs. .. .. .. .. 8, Lyndhurst Road

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Jessop, Edward, M.R.C.S., L.R.C.P., 81, Fitzjohn's Avenue
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Jevons, Miss H. W. .. .. 19, Chesterford Gardens
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Jones, H. Sydney .. .. .. 39, Heathurst Road
Jones, E. Vaughan .. .. 9, Well Walk
Jones, V. Vaughan .. .. 9, Well Walk
Jones, Miss H. Vaughan .. .. 9, Well Walk
Joshua, Philip .. .. .. 45, Belsize Avenue

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Lister, Miss .. .. .. .. Upper Heath
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MacGregor, Miss H. D. .. .. 4, Prince Arthur's Road
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Mallam, W. A., M.R.C.S., L.R.C.P., 63, Rosslyn Hill
March, Miss M. .. .. .. 74, Park Hill Road
Marks, K. I., F.R.M.S. .. .. 9, Randolph Gardens, N.W.
Maroti, C. H. .. .. .. 22, Winchester Road, N.W.
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Martin, Miss F. .. .. .. 3, Foley Avenue
Mayle, Sydney C. .. .. .. 70, High Street
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Moore, Miss M. E. .. .. 5, Gayton Crescent
Moore, Mrs. Wm. .. .. .. 16, Denning Road
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Murdock, G. H. .. .. .. 31, Nassington Road
Murray, T. .. .. .. .. 59, Nassington Road

Nash, Mrs. S. Fraser .. .. 136, Haverstock Hill
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Neville, E. G. .. .. .. 57, Gondar Gardens
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Nicholson, C. S., F.L.S. .. .. 22, Crouch Hall Road, Crouch End, N.
Nicholson, Miss M. E. .. .. 8, Hampstead Hill Mansions

Orr, Miss M. S. .. .. .. 30, Heath Hurst Road

Pace, Harry .. .. .. 21, Constantine Road
Paine, F. E. .. .. .. Hillfield, Haverstock Hill
Paneti, E. T. .. .. .. 71, Adelaide Road
Park, B. C. P. .. .. .. 19, Primrose Hill Road
Park, Mrs. .. .. .. .. 19, Primrose Hill Road
Park, D. F., F.Z.S. .. .. 73a, Belsize Park Gardens
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(Member of Council)
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PEARSE, D. COLBRON .. .. 14, Willow Road
(Assistant Secretary)
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Pearse, Mrs. .. .. .. 14, Willow Road
Perrins, Ronald .. .. .. 1, Kemplay Road
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Phillips, A. Stanley .. .. 84, Alexandra Road
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Pridham, Miss .. .. .. 5, Squires Mount
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Purry, Mrs. .. .. .. 44, Well Walk

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Raisin, Mrs. .. .. .. .. 41, Heathurst Road
Raisin, W. F. .. .. .. 41, Heathurst Road
Randall, T. Gurney .. .. 40, Englands Lane
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Rye, H. .. .. .. .. 9, Wentworth Mansions, John St.

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Sabey, Miss G. .. .. .. 44, Park Street, N.W.
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Sharman, Henry, M.D. .. .. Sedgemoor, Arkwright Road
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L.R.C.P. (Member of Council)
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Steinberg, Miss C. F. .. .. 54, Fellows Road
Stevenson, Miss .. .. .. 2, Prince Arthur Road

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Stopes, Miss Marie, C.C., B.Sc. .. 25, Denning Road
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Strange, R. Gordon, M.B., B.S. .. 2, Belsize Avenue
Strange, Miss .. .. .. 2, Belsize Avenue
Swain, Edward .. .. .. 5, Tanza Road

Taylor, E. Claude, M.D., F.R.C.S., Eland House, Rosslyn Hill
M.S.
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Tebb, Mrs. A. E. .. .. .. 226, Finchley Road
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Thompson, Mrs. .. .. .. 26, Ellerdale Road
THOMPSON, Prof. SILVANUS, P., Morland, Chislett Road, West
D.Sc., F.R.S. (Vice-President) Hampstead
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Thorn, Miss M. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss R. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thornely, W. .. .. .. High Close, Holford Road
Thornely, Miss .. .. .. High Close, Holford Road
Thrower, Alfred .. .. .. 1, Chalcot Gardens
Turner, G. H. .. .. .. 35, Rosslyn Hill

Underdown, Herbert W. .. .. 22, Belsize Crescent
Underdown, Miss E. .. .. 22, Belsize Crescent

Venning, S. D. .. .. .. 172, Broadhurst Gardens
Viner, Miss F. A. .. .. .. 15, Thurlow Road
VIZARD, P. E. (Vice-President .. Belsize Lodge, Belsize Lane
and Astronomical Secretary)
Vizard, W. G. .. .. .. 22, Downshire Hill

Wainwright, Shirley .. .. Elm Lodge, Elm Row
Walker, Rev. F. A., D.D., F.L.S., Dun Mallard, Shoot-up-Hill, N.W.
F.E.S.
Wallis, Ernest .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. .. .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. Isabel White .. .. Upper Frognal Lodge
Ward, Lawrence .. .. .. 159, Broadhurst Gardens, West
Hampstead

Watkins, C. A. .. .. .. 77, Fitzjohns Avenue
Watt, H. B., M.B.O.U. .. .. 3, Willow Mansions, Fortune Green Road
Watts, P. A. .. .. .. 49, Goldhurst Terrace
Wells, Josiah .. .. .. 1, Arkwright Road
Wesley, James H. .. .. .. 81, Fairbridge Rd., Upper Holloway
White, C. T. .. .. .. 17, Parolles Road, Upper Holloway
Whiting, James E. .. .. 41, Heath Street
Wightman, Charles .. .. 43, Portland Place, W.
Wilkins, Miss .. .. .. 1, Ellerdale Road
WILKS, Sir SAMUEL, Bart., M.D., LL.D., F.R.S. (President) 8, Prince Arthur Road
Wilks, Mrs. .. .. .. .. 19, Denning Road
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Williams, P. H. .. .. .. 27, Mincing Lane, E.C.
Willis, Herbert J. .. .. .. 26, Kemplay Road
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Withers, J. E. .. .. .. 49, Maresfield Gardens
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Woodman, Miss E. A. .. .. 121, Constantine Road
Woodward, Frank .. .. .. 10, Church Row
Wright, E. B. .. .. .. 13a, Gardner Road
Wylie, R. W. .. .. .. 32, Willoughby Road

Yearsley, P. Macleod, F.R.C.S., F.L.S. 10, Upper Wimpole Street, W.
Yeld, Miss M. .. .. .. 17, Platts Lane

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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With a List of the Members.

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*For the Year* 1904.

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THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

By the generous gift of Colonel Heberden, the Society is the possessor of a reflecting telescope of 10½ inch mirror, which is erected in a small observatory on the East Heath by permission of the London County Council. Particulars as to the use of the Telescope can be obtained of the Hon. Astronomical Secretary.

A General Meeting of the Society is held at the Hampstead Library, Prince Arthur Road, or at the Town Hall (Small Hall), on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 p.m. precisely. Meetings of the various Sections are also held regularly at the Hampstead Library.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, of having free access to the Telescope, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretary, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned.**

C. O. BARTRUM,
*Hon. Secretary of the Society,*
3, Holford Road,
Hampstead, N.W.

*February*, 1905.

# Hampstead Scientific Society.

## *List of Officers for the Year 1905,*

Elected at the Annual Meeting, February 3rd, 1905.

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Sir SAMUEL WILKS, Bt., M.D., LL.D., F.R.S.

**Vice-Presidents.**

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EDWARD BOND, M.A., M.P.
Mrs. SOPHIE BRYANT, D.Sc.
Prof. F. Y. EDGEWORTH, M.A., D.C.L.
Sir HENRY HARBEN, J.P.
Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.
FRANK PODMORE, M.A.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*)

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C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS, F.I.J.
E. S. PAYNE.*
F. W. RUDLER, I.S.O., F.G.S.
WALTER SCHRÖDER.
E. W. H. SHENTON, M.R.C.S., L.R.C.P.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.
F. WOMACK, M.B., B.Sc.
P. MACLEOD YEARSLEY, F.R.C.S., F.Z.S.

**Hon. Treasurer.***
E. COMPSON CRUMP,
L. & S.W. Bank, Ltd.
High Street, Hampstead.

**Hon. Secretary.***
C. O. BARTRUM, B.Sc.
3, Holford Road,
Hampstead.

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**ASTRONOMICAL SECTION:**
**Hon. Secretary.***
P. E. VIZARD, F.R.A.S.
Belsize Lodge, Belsize Lane.
Hampstead.

**PHOTOGRAPHIC SECTION:**
**Hon. Secretary.***
H. NEVIL SMART.
40, Compayne Gardens,
West Hampstead.

**NATURAL HISTORY SECTION:**
**Hon. Secretary.***
J. W. WILLIAMS, M.R.C.S., F.L.S.
128, Mansfield Road, N.W.

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* *Executive Committee.*

# Report of the Council,

FOR THE YEAR 1904.

*Read at the Annual Meeting, February 3rd, 1905.*

THE Council has pleasure in reporting that the past year has been one of increased activity. There have been 56 new members elected during the year. The number of members is now 333, showing an increase of 18 since the last report.

The Society is to be congratulated on the return of the President, Sir Samuel Wilks, completely restored to health after his long and dangerous illness in the Spring. It is of interest to record that he took to his bed—from which he did not rise for so many months—immediately after the General Meeting on February 5th, at which, though already in pain, he had presided. The Council again has the benefit of his active interest and vigorous participation in the work of the Society.

The Accounts of the Society have been duly audited for the year 1904. A statement of Receipts and Expenditure will be found on pages 8 and 9. The ordinary income from subscriptions and entrance money has increased, but is yet, in spite of careful economy, unequal to the expenditure. This difference, which in 1902 was £23 6s. 5d., and in 1903 £19 3s. 9d., is reduced in 1904 to £7 10s. 8d. There remains an

accumulated deficit of £28 11s. 4d., which it is desirable to extinguish. The Hon. Treasurer is grateful to those members who have generously subscribed more than the minimum. Among the subscriptions were 26 at 7/6, 36 at 10/-, 18 at 10/6, 1 at 15/-, 2 at 20/-, 7 at 21/-. The Council is anxious not to be compelled to raise the minimum subscription, and appeals to those members who are able to do so, to increase their subscription. The Council again has to thank Dr. Williams for generously bearing the expense of printing and postage for the Natural History Section.

The number of meetings held during 1904 has been 33, and in addition there have been four Christmas lectures to children and a course of six lectures on Nature Study. The proceedings at the general and sectional meetings will be found accompanying this Report (see page 10).

The attendance at the General Meetings, which are now held at the Small Hall of the Town Hall, has again shown an increase.

The Natural History Section has made progress during the past year. Blackboard demonstrations (with specimens) have been made an additional feature of the work of the Section in the present Session, and are invaluable for teaching purposes.

Six lectures were delivered during the year in connection with the Astronomical Section, of which particulars are given on page 19. Mr. Vizard arranged several evenings during October for observations, at his garden in Belsize Lane, with a telescope kindly placed at the disposal of the members by Mr. George Avenell.

The Photographic Section has held ten meetings during the year. They consisted of Lectures and Demonstrations on various subjects connected with Photography, and proved of great interest to the members. The Annual Exhibition was held in December as usual, and was one of the best that has been arranged. The general standard of members' work shown was above the average, and speaks well for the progress the Section has made during the year. The Exhibition was open for two days, and was attended by a large number of visitors (see page 27.)

The Christmas juvenile lectures, which were a new departure, were well attended, were evidently appreciated, and yielded a small profit to the funds of the Society (see page 29).

With a view to encouraging the movement for the systematic training of children in the application of scientific method to matters of every-day life, a course of lectures on Nature Study, with practical work, was organised, which it was hoped would be a guide to teachers and others in the method of conducting such instruction. The syllabus will be found on page 28. The lectures were largely attended by teachers from elementary and secondary schools in the north and west of London, by parents and others. Much interest was shown, and the course was a financial success. A further course will be given in the coming Spring. The Council is indebted to Miss von Wyss for so ably conducting the course and for warmly furthering the object in view.

Thanks must be given to the Committee of the Hampstead (Northern Heights) Branch of the Selborne Society for kindly inviting the members of the Hampstead Scientific Society to three of their Summer Field Meetings.

# STATEMENT OF ACCOUNTS.

## *For the Year ending 31st December, 1904.*

### RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1904 Subscriptions paid in 1903, brought forward ... | 11 | 8 | 0 |
| Subscriptions paid in, and for 1904 ... ... ... | 81 | 3 | 0 |
| Nature Study Lectures ... ... ... ... ... | 13 | 16 | 10 |
| Juvenile Lectures... ... ... ... ... | 5 | 1 | 6 |
| Conversazione Tickets Sold ... ... ... ... | 3 | 18 | 6 |
| Anon. Donation for Cylinder ... ... ... ... | 3 | 18 | 8 |
| Mr. P. E. Vizard's Donation ... ... ... ... | 1 | 10 | 0 |
| Receipts in 1904 ... ... ... ... ... | 120 | 16 | 6 |
| Deficit on 1904 ... ... ... ... 6 0 8 | | | |
| Deficit brought forward from 1903 .. 22 10 8 | | | |
| Present total Deficit ... ... ... 28 11 4 | 28 | 11 | 4 |
| | £149 | 7 | 10 |

### EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... ... | 18 | 9 | 3 |
| Report ... ... ... .. ... ... ... | 10 | 7 | 0 |
| Rent Town Hall ... ... ... ... ... | 8 | 8 | 0 |
| Rent Stanfield House ... ... ... ... ... | 12 | 18 | 0 |
| Advertisements ... ... ... ... ... ... | 8 | 4 | 0 |
| Conversazione Refreshments ... ... ... ... | 7 | 11 | 6 |
| Do. do. Decorations, etc. ... ... ... ... | 2 | 11 | 0 |
| Nature Study Lectures ... ... ... ... ... | 6 | 7 | 8 |
| Notice Board and Case ... ... ... ... ... | 2 | 9 | 6 |
| Operating Lantern, etc. ... ... ... ... ... | 2 | 11 | 2 |
| Cylinder and Gauge ... ... ... ... ... | 3 | 18 | 8 |
| Royal Photographic Society ... ... ... ... | 1 | 1 | 0 |
| South Eastern Union of S.Ss. ... ... ... ... | 0 | 15 | 0 |
| Photo Section Sundries ... ... ... ... ... | 2 | 15 | 2 |
| Astronomical Section Sundries ... ... ... ... | 1 | 10 | 0 |
| Assistant Secretary ... ... ... ... ... | 15 | 0 | 0 |
| Stamps for Receipts ... ... ... ... ... | 0 | 10 | 0 |
| Sundry Expenses, per Hon. Secretary— | | | |
| Postages ... ... ... ... 13 6 2 | | | |
| Printing, etc. ... ... ... ... 2 16 5 | | | |
| Lantern ... ... ... ... 1 8 1 | | | |
| Conversazione ... ... ... ... 1 18 6 | | | |
| Sundries ... ... ... ... 2 1 1 | | | |
| | 21 | 10 | 3 |
| Expenditure in 1904 ... ... ... ... ... | 126 | 17 | 2 |
| Deficit at end of 1903 brought forward ... | 22 | 10 | 8 |
| | £149 | 7 | 10 |

Subscriptions in hand for 1905 paid in 1904, £16 8s. 0d.

E. COMPSON CRUMP, *Hon. Treasurer.*

*Audited and found correct,* E. S. PAYNE,

WALTER SCHRODER.

# EPITOME OF EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| General .. .. .. .. .. .. .. .. .. | 31 | 4 | 1 |
| Astronomical Section .. .. .. .. .. .. .. | 5 | 10 | 9 |
| Natural History Section .. .. .. .. .. .. .. | 1 | 11 | 6 |
| Photographic Section .. .. .. .. .. .. .. | 13 | 6 | 2 |
| Children's Lectures— | | | |
| (Receipts £4 6s. 0d.) .. .. .. .. .. .. .. | 3 | 13 | 6 |
| Nature Study Lectures— | | | |
| (Receipts £13 16s. 10d.) .. .. .. .. .. .. | 11 | 7 | 8 |
| Conversazione— | | | |
| (Receipts £3 18s. 6d) .. .. .. .. .. .. | 17 | 13 | 6 |
| Syllabus, Printing and Advertising .. .. .. .. .. | 8 | 7 | 0 |
| Report, Printing and Issuing .. .. .. .. .. .. | 11 | 5 | 1 |
| Assistant Secretary .. .. .. .. .. .. .. | 15 | 0 | 0 |
| Lantern, etc. .. .. .. .. .. .. .. .. | 7 | 17 | 11 |
| | £126 | 17 | 2 |

# Abstract of Proceedings.

1904.

## General Meetings.

Friday, January 9th. Sir Samuel Wilks, Bt., M.D., F.R.S., President, in the Chair.

**Mr. F. W. Rudler, I.S.O., F.G.S.,** gave a lecture entitled **"The Geology of London, with special reference to the Northern Heights."** The lecturer said that at any ancient centre of population, like the City of London, there is sure to be found near the surface a quantity of artificial rubbish, representing the remains of old roads and buildings, and known as "made ground." These historical relics, which have been accumulating in the City for some two thousand years, rest upon those deposits which geologists recognize as alluvium and drift. The alluvium under Westminster, Lambeth, the Isle of Dogs, and elsewhere along the river, is mostly old inundation mud of the Thames, and contains, in addition to historical relics, many remains of prehistoric art, going back to the Bronze and Neolithic periods. Older than these are the gravels and brick-earths which spread over a wide area in the Thames Valley, and lie under the City, Islington, and all the older parts of London and its suburbs. These deposits have yielded many relics of the older stone-using age known as the Palæolithic period, represented principally by flint implements occurring in association with remains of mammals, many of which are either locally or absolutely extinct. The central figure in this Pleistocene fauna was the mammoth, or great hairy elephant, the bones and teeth of which are not infrequently found in London and its neighbourhood. The late Dr. Henry Hicks obtained in 1884 some interesting relics of this creature in Endsleigh Gardens, Euston Square. Some of the mammalian bones, like those of the musk-ox, suggest a very cold climate during the part of the Pleistocene age, and this refrigeration culminated in that episode of geological history known as the Glacial period. Evidence of the action of ice is afforded by the boulder-clay and glacial sands and gravels at Finchley, Muswell-hill, and Barnet, but the great Northern "drift" does not come further southwards. The Northern Heights of Hampstead, Highgate, and Harrow are capped by outliers of the Lower Bagshot sands. The main mass of these beds covers a large area in Surrey

especially at Bagshot Heath, but it must formerly have had a much greater northern and eastward extension, since it is represented by isolated patches not only in the North of London, but far into Essex. The minerals in the sands of Hampstead Heath have been carefully studied by Mr. Allan Dick. The Bagshot sands, more or less iron-shot, repose on the London clay, into which they pass insensibly downwards, the upper part of the clay being sandy or loamy. At the junction of the sands with the stiff clay, water which has soaked through the permeable porous beds will be thrown out; and hence the source of many springs and streams. The water, in percolating through the ferruginous sands, dissolves more or less iron, so that it may form a chalybeate spring, such as the well-known source in Well-walk, to which Hampstead at one time owed its reputation as a spa, and became the favourite resort of fashionable society. The impermeable clay holds up the waters of the Hampstead and Highgate ponds. The old Fleet river, the Tybourne, and the head waters of the Brent, rise partly from the drainage of the clay land, and partly from the junction of the pervious sands with the impervious clay. The London clay, which covers a very large part of the London Basin, reaches a maximum thickness of about 500 feet in South Essex and in the Isle of Sheppey. In the old boring on the Lower Heath at Hampstead the clay was 289 feet thick. At the Orphan School at Haverstock Hill the thickness is 223 feet; and further southwards, at a lower level it is less, being reduced at the old Hampstead Road Reservoir (now Tolmers Square) to only 59 feet. The London clay contains numerous concretions of argillaceous limestone, known as "turtle stones," "septaria," or "cement stones," the last name having a reference to their former use in making "Roman cement." These septarian nodules frequently enclose fossils as nuclei. There are also found in the London clay small nodules rich in phosphate of lime, crystals of selenite, often known as "congealed water," and masses of iron-pyrites, or disulphide of iron. The fossils of the London clay, which have occasionally been found abundantly at Hampstead, Highgate, and Primrose Hill, and other localities in the North of London, suggest a warm, almost tropical climate. They include cones, cowries, spindle shells, and several species of nautilus. In the Isle of Sheppey fossil fruits are common in the clay, and many of these suggest tropical relations, being akin to the nipa palms of Bengal and the Spice Islands, the oil palms of Africa, and other plants of hot climates. The London clay rests on a series of beds known as the Lower London Tertiaries, which in turn repose upon the chalk. Numerous deep wells in London draw their supplies from the chalk, but the attempt to obtain water from Lower Greensand made at the famous Kentish Town boring

in 1856, and at Meux's Horseshoe Brewery twenty years later, utterly failed. The Lower Greensand thins out and disappears under London, as also do many other Secondary strata, so that a range of old Palæozoic rocks is brought within moderate distance of the surface. In Tottenham Court Road (Meux's Brewery) Devonian rocks were struck at 1066 feet. It is quite within the range of geological probability that the coal measures pass beneath London, or its neighbourhood, at no very great depth.

On Friday, February 5th, the Annual General Meeting was held under the presidency of Sir Samuel Wilks, Bt., F.R.S., the President. The Report of the Council was read and adopted. The President, Officers and Council were elected.

The meeting was resolved into an Ordinary Meeting. The **Rev. H. N. Hutchinson, B.A., F.G.S.,** gave a lecture entitled **"Extinct Monsters,"** illustrated with models, with lantern photographs of actual remains and of completed skeletons, and with lantern views by Mr. J. Smit of restorations from skeletons.

Mr. Hutchinson first showed a restoration of a gigantic sea-scorpion (Eurypteus) of the Old Red Sandstone which was as much as six feet in length. He spoke of the great fish-lizards of the Jurassic period, the Ichthyosaurus with short neck, ponderous head and jaws, and large eyes with bony plates; and the Plesiosaurus with long neck and small head. These creatures measured some twenty or thirty feet in length. Their restorations were shown amid the contemporaneous plants and animals. There were shown representations of the Deinosaurs, the greatest reptiles whose remains have ever been found. They were terrestrial or in some cases amphibious. Of these was the Brontosaurus, discovered by Prof. Marsh in America, which measured 60 feet in length and was computed by the lecturer to have weighed as much as twenty tons. Its contemporaries in Europe were the Megalosaurus, the Cetiosaurus, the Pterodactylus and the Iguanodon. Styosaurus and Triceratops are later American discoveries in strata of the period. The Pterodactyls shew an interesting approach among reptiles to the characters of birds. They had claws, beak-like jaws with teeth, feathered wings, and a pair of feathers at each vertebral joint of the tail.

Mr. Hutchinson showed restorations of a marine serpentine reptile, Clidastes, of seventy feet in length, from the period of the chalk formation. The extinct mammals of tertiary and pleistocene times included the giant sloth Megatherium, the mastodon, the hairy mammoth, and the woolly rhinoceros. The last monster shown was the moa of New Zealand, an ostrich twelve feet high that has become extinct in historic times.

Friday, March 4th, 1904. Mr. P. E. Vizard, F.R.A.S., Vice-President in the chair.

**Professor W. R. Cassie, M.A.,** gave a lecture on "**The Planet Mars**" illustrated with lantern slides. Professor Cassie described the position of Mars in the solar system and its relative size to other bodies, its diameter being about half that of the earth. Its motion relative to the earth in a series of loops was clearly shown by means of a diagram in the form of a curve, the earth being supposed to be fixed at the centre. The most favourable times for observation are those in which Mars is in opposition, which occur every two years. The planet is then nearest to us and presents a fully illuminated disc, though there is a great advantage in some oppositions in this respect over others, these occurring every fifteen years. The lecturer showed drawings of the planet made by Sir William Herschel at the end of the eighteenth century, in which the polar caps of supposed snow were seen. Herschel determined the day of Mars to be of about twenty-four hours' duration, and showed that in the obliquity of its equator it also resembles our earth. Lowell has made careful observations of Mars at his observatory at Flagstaff, Arizona, a site selected for the clearness of its atmosphere. The surface of the planet is of a reddish colour with patches of green, which have been described as seas, though it has been shown that, since the light reflected from them is not polarized, they do not contain water. Lowell observed that, as the polar caps diminished in the planet's Spring, patches of white were left upon spots which, by their projection beyond the planet's limb during rotation, he determined to be mountains. From these patches, at times, he observed brilliant flashes of light, which failed in a few minutes as the planet rotated. These flashes he found were polarized, and concluded that they were reflected from the icy slopes of these mountains, as one may often observe the sunlight to be reflected temporarily from a distant window. Schiaparelli of Milan first observed, in 1877, certain lines on the surface of Mars, which he called "Canali." He paid great attention to them for some years, discovering more of them and many which appeared double. Until 1886 no one else had succeeded in seeing them; but from this date the number of these canals was greatly increased by different observers. They are drawn as straight lines across the "seas." Where they cross a small expansion is generally observed. Lowell's observations led him to believe that the darkening seas round the polar cap in the Spring consist of water from the melting snow; that this water finds its way over the planet's surface by means of these "canals," whose function is that of irrigation; that with the extending of the water a green tint spreads along the neighbourhood of the canals, which he

takes to be vegetation. These canals are admittedly difficult to see. Indeed, Barnard, with the magnificent equipment at the Lick Observatory, has never been able to see them. It has been thought, therefore, by some, that they are of a subjective nature, due to an optical delusion under the strain of observation. Maunder, with a view to test this, set some model discs roughly representing Mars before some boys in Greenwich Hospital, who were told to draw what they believed they saw. He found that those who were at such distances as to see with difficulty drew lines across the surface, similar to the lines drawn by so may observers across the "seas" of Mars, which did not exist in the models. Prof. Cassie concluded by saying that we have no evidence that the planet contains intelligent beings.

On Friday, April 8th. Professor F. J. Edgeworth, M.A., D.C.L., a Vice-President, in the chair

**Mr. Macleod Yearsley F.R.C.S., F.Z.S.,** gave a lecture on **"Hearing in Animals and Man."** The lecturer began by sketching in outline the origin of the organs of special sense from the primitive protozoon, which is sensitive all over, to the higher animals which have specialized organs and nervous systems for receiving, transmitting and interpreting sense stimuli.

The auditory organ in its most elementary form consists of a small vesicle full of fluid. An auditory nerve terminates within this vesicle in special hair cells in contact with which are calcareous particles termed otoliths. Upon this fundamental basis the hearing organs of nearly all animals are constructed with the addition of more or less accessory apparatus.

Discussing the question whether the lower animals possess a sense of hearing, the lecturer argued that it would seem reasonable to suppose that those that have organs for producing sound are able to perceive sound.

Mr. Macleod Yearsley described and showed drawings of the hearing organs in the coelenterata, annelida, mollusca, and echinodermata. He also described the forms of auditory apparatus found in the arthropoda, referring especially to the crustacea and insecta.

In vertebrates the simple otocyst becomes the more complex membranous labyrinth enclosed in the lateral wall of the skull. The lecturer led the audience through the changes of form of the labyrinth shown in fish, amphibian, reptile, bird and man. He also showed the differences in the internal and external accessory parts. He showed that the bird-like affinities of the monotreme or nithorhyncus extend to the anatomy of the ear.

The working of the human auditory apparatus was discussed

and the theories of Helmholz, Hensen, Ziehen and Waller were explained and dismissed. The most likely theory yet advanced was the " telephone theory " of Rutherford according to which the ear transforms vibrations into nerve-impulses of the same period and related amplitude.

Friday, May 6th, 1903. Mr. E. S. Payne in the chair.

**Dr. T. Milne Bramwell, M.B., C.M.,** gave a lecture entitled **" Secondary and Multiple Personalities, with special reference to Personally Observed Hypnotic Phenomena."** The lecturer said it would perhaps have been better if he had said that his remarks would be on alternating states of consciousness, and left it to later on to say whether those states could be called different personalities. He would first draw their attention to the case of a hypnotic subject who, while in a condition of hypnosis, was able to perform mental work such as she could not perform in her ordinary state. She first came under his notice as a patient, with a grave and long-standing disease, from which she eventually recovered. He found that she would carry out certain simple suggestions, and when she recovered he obtained the consent of her mother to carry out a number of more complicated suggestions. The chief form of experiment was to suggest to her that she should write down the time of the clock without looking at the clock, and after the expiration of a certain complicated time, such as 40,845 minutes. In her ordinary state—she was a girl of little education—she would have been quite incapable of working that out ; but out of fifty-five experiments of a similar kind forty-five were carried out with absolute accuracy. The other ten were relatively correct, five minutes being the largest variation she made. When she awoke from the hypnotic state her normal self could recall nothing of what had just passed. He would next call their attention to a very curious case of what he might call automatic writing. He got one subject, a man, to write down some verses which he knew. Afterwards he gave him something to read, and while he was reading he suddenly said " Sleep " and put the man, who was a good subject, into a hypnotic state immediately. While he was in that state he suggested to him that he should write down how many times a certain letter occurred in the verses which he had written. He then aroused him from the hypnotic state, placed paper and pencil near him, and then told him to continue reading. He did so, and, while he was reading, worked out how many times the certain letter occurred in the verses which he had previously written down, and wrote down the number correctly. This he did quite unconsciously, and when he (the lecturer) asked him what he had been scribbling about he did not know. In that

case there were clearly two states of consciousness at work at the same time, one reading and understanding something, and the other making a mental calculation which had nothing whatever to do with what he was reading. There were other conditions of alternating consciousness not in hypnotics. One which came under his notice was that of a well-known professional musician, who had certain lapses, during which he used to think he was an itinerant musician, who used to stand and play at street corners. During those periods he used to deny his own name, but said he was someone else, and he did not know his own friends. There were many other cases of the same sort, but in some the secondary state was the brighter and better of the two. In most of these cases they had continuous memories, and used to take up each life where they had dropped it before each change. There were cases which seemed to show that there was a third state sometimes at work. In the first case quoted, that of the girl who made the mental calculations as to the large number of minutes, etc., he asked her, while she was in the hypnotic state, to tell him how long it would be before she had to perform certain things which he suggested. In all cases the answers were entirely wrong, and yet, to his surprise, she did her things at the right times. That seemed to show that there was a third personality which was superior to the other two; but he did not think those cases justified them in concluding that there were really distinct personalities in the same person. To the physiologist something more was wanted than merely alternative ideas, memory, and temper. He was convinced, however, that a comparative study of the different states was of the utmost psychological importance.

A brief discussion followed the remarks of the lecturer, and, replying to some questions, Dr. Bramwell said that in the case of the calculating girl there was no possibility of telepathy or thought transference, as in most cases he did not make out the calculations himself; when he did so he was generally wrong. As to the tests he applied to show that the subjects were really in the hypnotic state, there was no one conclusive proof except insensibility in those cases where, by suggestion, insensibility to pain could be induced.

On Wednesday, November 2nd, the General Meeting took the form of a Conversazione at the Town Hall to inaugurate the Session 1904–5. **Professor Silvanus P. Thompson, D.Sc., F.R.S.**, Vice-President, gave an address on **"Japanese Magic Mirrors."** Sir Samuel Wilks, Bt., F.R.S., President, occupied the chair.

Professor Thompson said that in the old civilisation of Japan, which came down unbroken until about 1873, the mirror was to

the Japanese women what the sword was to the Japanese man, the most precious thing she had. It had a religious significance, and in places where the Japanese had given offerings to their gods could be found many thousands of swords and mirrors. Those mirrors were not like ours of to-day. They were not made of glass but of bronze silvered in a primitive way with an amalgam of tin and mercury. Unfortunately when the polish wore off it could not now be replaced, as Western art had swept away the art of Japanese mirror-making. The mirrors were kept covered up to be brought out only when wanted. The lecturer showed pictures on the screen of several Japanese mirrors, calling particular attention to the figures on the back which were either heraldic, symbolic, or of letters. Throughout the writings of mediæval times could be found casual references to magic mirrors. Pythagoras was said to have been able to send a word to a besieged city by writing it in blood on a mirror and throwing the disc of light upon the moon. He believed that what Pythagoras did was to reflect the sun's light from a mirror. A Japanese magic mirror had when ordinarily viewed a plain polished surface. When, however, the sun's rays were reflected from the surface upon a screen the characters in relief on the back were seen in the reflected image. This Prof. Thompson showed by means of an arc-light in place of the sun, reflecting the light on to the lantern screen from the Japanese mirrors, of which he has made a collection. The Japanese were not aware of the cause of the "magical" properties of their mirrors, the discovery having been first made by the English professors, Ayrton and Perry, while living in Japan. The explanation given by them is that under the heavy pressure used in the art of polishing the thin metal bends slightly, those portions which are strengthened by the relief of the design on the back bending less than the spaces between. It results then in these interspaces being less abraised by the polishing tool than the backed portions, the latter, after removal of the pressure, forming slight concavities in the polished surface. That this is the true explanation has been proved in several independent ways. The concavities have been detected by measurement with a spherometer. Again, Prof. Thompson having had a cast made from the surface of a magic mirror, the cast was found to have the magic properties of the original.

Exhibits were kindly lent by Mrs. Beach, Mr. Hugh Findon, Mr. L. B. Hall, Mr. Montague F. Hopson, Rev. H. N. Hutchinson, Mrs. Park, Mr. James E. Whiting, Mr. M. Yeatman Woolf and Messrs. Watson and Son. A Foucault's Pendulum was shown by Mr. C. O. Bartrum. A selection of music was given during the evening by Miss Ada Stuart, Mrs. Moir, Miss Lizzie Slocombe, Dr. Miley, Miss May Walker and Miss Lilian Davis.

Thursday, December 15th, 1904. Sir Samuel Wilks, Bt., F.R.S., President, in the chair.

**Professor W. Boyd Dawkins, M.A., D.Sc., F.R.S.**, gave a lecture on "**The Incoming of the Brythons into Britain.**" The lecturer said the people of whom he was to speak were those to whom we owed the name of Britain, and the story of their coming was one reaching back far beyond written records, and one which gave a clear idea of the successive races in the prehistoric times. The history of this country started from 54 B.C., but they had records which spoke of this country as far back as 335 B.C. The history of Egypt and Assyria was in full swing and splendour when the people in Europe were in the prehistoric age. The lecturer then referred to the Neolithic period, the age when metals were unknown for purposes of instruments and weapons, and showed lantern slides of a number of interesting stone axes, etc., found in chambered tombs discovered near St. Asaph. He also spoke of the coming of the Iberic Stock in the Neolithic Age, and of the Goidelic Stock in the later Bronze Age, and showed traces of the culture of these people in the present names of various places in the country. These people lived in Wales, all through Ireland, and all through the Orkney Islands, as was shown by the discoveries made of their temples, burying grounds, etc. In the Bronze Age the Brythons mingled with the Iberians, whom they had conquered, and formed practically one population. The lecturer then spoke of many interesting discoveries of Brythonic villages, in particular of the Lake Village near Glastonbury, and showed many pictures of implements which had been found belonging to this age, together with a number of fine specimens of the potter's art. He also mentioned that among other finds at this village was that of dice of the period, which were discovered to be loaded, and a spur which had evidently belonged to a game-cock, showing that, although the people were industrious, they were also of a sporting tendency. Coins had also been found which belonged to a period some time before the Roman Conquest. There had also been similar finds at Northampton and Canterbury. The beginning of civilization in this country dated from these people, and they could trace the successive races up to the present British people. In the ethnology of this country they could not trace any evidence of the Roman or Italian.

## Outdoor Meeting.

On Thursday, July 21st, by the kind permission of the Earl of Mansfield, the Grounds of Ken Wood were open to members from 3 to 8 p.m. At 6 p.m., Mr. James E. Whiting conducted a party through the grounds. Mr. P. E. Vizard afterwards addressed the members upon the history of the house and grounds.

On Saturday, October 8th, a visit was made to the Fossil Mammal Gallery of the British Museum (Natural History), South Kensington. Dr. C. W. Andrews gave an interesting discourse upon the specimens.

By arrangement with the Committee of the Hampstead (Northern Heights) Branch of the Selborne Society, members were invited to join in the following rambles :—

Saturday, April 30th, in the neighbourhood of Northwood, Mr. James E. Whiting acting as guide.

Saturday, May 28th, Pinner, Eastcote and Ruislip. Mr. Whiting again conducting.

Saturday, July 23rd. Chalfont St. Giles, under the guidance of Mr. L. Douglas Wilson.

## Astronomical Section.

The following Lectures were given during the year :—

February 8th.—" Sun-spots," by Mr. Harold W. Raisin.

Solar Energy ; its Source and Supply ; Radium theories ; various forms of Sun-spots and Faculæ ; theories as to their Origin, Character and Effects ; their connection with Terrestrial Magnetism, Rainfall, etc. ; Periods of Maximum and Minimum Sun-spots.

March 7th and 14th.—" Galileo, the Father of Telescopic Astronomy," by Mr. P. E. Vizard, F.R.A.S.

Sketch of Galileo's Life ; his discoveries with regard to the Pendulum ; the Law of Falling Bodies ; The Telescope ; Jupiter's Moons ; Saturn's Ring, etc. ; Story of his treatment by the Roman Church.

November 7th.—" Some Revelations of the Spectroscope," by Mr. P. E. Vizard, F.R.A.S.

Spectroscope ; its History, Construction, Mode of Operation ; Meaning of the term " The New Astronomy " ; Chemistry of the Stars ; their distance and how measured ; their Age, and various Stages of Development.

November 18th.—"The Moon," by Mr. Goodacre, F.R.A.S. Theories as to its Origin; its Period, Rotation on its axis; its Phases; Eclipses of the Moon; Lunar Geography, etc.

November 28th.—"More Revelations of the Spectroscope," by Mr. P. E. Vizard, F.R.A.S.

Classification of Stars; Double and Variable Stars; "Dark" Stars; Worlds illuminated by Suns of Different Colours.

## Natural History Section.

Committee for 1905.—Geo. Avenell, Hugh Findon, M. F. Hopson, F.L.S., F.E.S., C. S. Nicholson, F.L.S., P. Macleod Yearsley, F.R.C.S., F.Z.S., J. W. Williams, M.R.C.S., F.L.S., F.R.M.S. (Honorary Secretary).

This section of the Society has made very considerable advance during the past year, not only in the number of new members, but also in the character of its teaching. While the formal lectures of past years are still given, some evenings are now devoted to blackboard demonstrations (with actual specimens dissected and otherwise) of selected types with the view of inculcating a love of natural history, and especially of its various associated problems in those who, though members, are not yet *per se* naturalists. These demonstrations, considering their teaching value, should be largely attended. Arrangements for out-door meetings of a social character are being made for the coming summer. These should be invaluable, inasmuch as they will be associated and connected, *inter alia*, with meetings of the same nature of members of other societies, and will show the "budding naturalist" how to work and observe in the field. Due notice of these meetings will be given. The following meetings were held during the past session :—

Friday, January 15th, 1904. Sir Samuel Wilks, Bart., F.R.S., in the chair.

**Mrs. Park** read a paper (illustrated with exhibits) on "**The Fossils of the Stonesfield Slate,**" an interesting formation at the base of the great Oolites in the neighbourhood of Oxford. She stated that although called slate, because used for roofing purposes, the rock is really fissile sandstone. It contains many fossils, both of animal and plant remains, and the earliest butterfly is found there. It is, too, especially noted for the discovery in it of the first mammalian remains in 1764, though since then other

earlier remains have been found lower down in the Trias. Mrs. Park then mentioned the huge Deinosaurs which have left so many remains behind, such as Megalosaurus, a carnivorous lizard thirty feet in length, Teleosaurus, a crocodile seventeen feet long, and the curious bird-reptile known as Pterodactylus. These were illustrated by sketches. She also showed a number of teeth, scutes, and bones of these creatures, and a number of fossil shells, as well as leaves and twigs of cycads and other plants. There was strong evidence, she stated, that this deposit was formed in a lagoon to which flooded rivers carried the drowned bodies of land animals and plants to mix with the dead inhabitants of the water, all eventually to be covered up with the soft mud and reserved for the future inhabitants of the world to find.

The following exhibits were laid upon the table:—Two rare specimens of African parrots by Mr. Herbert Goodchild, M.B.O.U.; a shell-less mollusc (*Doris*) with egg-strap, and also some African tortoises by Mr. Hugh Findon; and an hydrozoon (*Hydractinia echinata*) and an Ascidian (*Salpa mucronata*) by Dr. Williams. The last exhibitor again raised the question, discussed at the last meeting of the section, as to the grouping and "place in nature" of the Ascidians, and showed by this example and the one he had previously shown, how it was that zoologists to-day did not regard them as a link between the vertebrates and invertebrates, but as degenerate forms of the former.

Friday, February 12th, 1904. Mr. Geo. Avenell in the chair.

**Miss Garlick** read a paper entitled "**Popular Flower Names,**" the chief aim of which was to suggest an answer to the objection so often made to botanists that they gave flowers such hard and long names. She thought that perhaps the difficulty was due to misapprehension on the part of the general public that it was part of the botanist's duty to supply names for ordinary use, when as a matter of fact, the botantists' standard in naming must not only be more exacting, but different. Since he must name every plant with regard to its place in a world-wide system, his name must be acceptable to the learned world and founded upon generally accepted rules, while the popular name is free from all these restrictions. She pointed out that a compromise had been attempted between the scientific and popular names of plants by translating, so far as might be, all the scientific names in the British flora, but that the compounds were awkward and not needed in ordinary speech, and that the observer who could distinguish all the species was quite prepared to use the scientific nomenclature. Such cumbrous compounds as "the

broad-leaved, smooth, clammy Campion" were in use before the time of Linnæus. She then made a few remarks on Linnæus's principles of naming, remarking that he made no attempt at identification of the classical names and stereotyped the blunders of a loose tradition, but that, nevertheless, literary criticism is here beside the mark, and, similarly, scientific criticism is not applicable to popular names. Miss Garlick fully admitted the inaccuracy and looseness of popular naming, and gave as examples the tea shrub, so called because 200 years ago, the label of a true tea plant and that of a Barbary thorn were accidentally exchanged; the Nasturtium, which has lost its old name of Indian-cress, and taken its later name from water-cress; and also the incongruous list of roses, including that of Jericho. Many other errors, she said, might be instanced, but they do not affect the value of the popular name, for it is needed and answers its purpose. She regretted the use of many home-grown names and the tendency to replace them by the scientific generic name, with no gain in accuracy and much loss in association. For instance, Digitalis for Foxglove, Antirrhinium for Snapdragon, Delphinium for Larkspur, and Gladiolus for Corn Flag. As arguments in favour of the use of popular flower names she pointed out their close connection with our history, both religious and social, as well as with the history of medical treatment; and to illustrate their use in the poets she quoted the passage describing love-in-idleness in "A Midsummer Night's Dream," and the description of a cottage garden in Matthew Arnold's "Thyrsis." To show the etymological interest of the names themselves, she traced back that of Gilliflower (Marie Antoinette's Julienne) through a genealogy of aromatics to its Greek origin (*καρυόφυλλον*) and identified Celery by means of the description of Calypso's garden in the Odyssey and the leaf on the coin of Selinus with Selinon, part of the compound word which gives us Parsley.

The following exhibits were shown:—A series of Silurian graptolites by Mrs. Park; a flying-fish (*Dactylopterus orientalis*) by Mr. J. E. Whiting; and the ephyra-stage of the common Jellyfish (*Aurelia aurita*) by Dr. J. W. Williams. With regard to this last exhibit, Dr. Williams showed, by means of drawings and blackboard sketches, how jellyfish were evolved from sea-anemones, and, when properly used, what a help Haeckel's fundamental biogenetic law "that the history of the individual is an epitome of the history of the race" was in solving the problem of the genesis of animals.

Friday, March 11th, 1904. Mr. A. W. Stokes, F.I.C., F.C.S., in the chair.

**Mr. L. B. Hall, F.L.S.,** gave a lecture (illustrated with lantern slides) on **"Adaptations in Plants."** The lecture dealt chiefly with the œcology of mosses.

Friday, April 15th, 1904. Mr. P. Macleod Yearsley, F.R.C.S., F.Z.S., in the chair.

**Mr. Hugh Findon** read a paper entitled **"How Shells are Built,"** and having shown by means of a diagram, that the general shape of a shell was no guide to the species of animal which inhabited it, he demonstrated the fact that the forms of all shells were founded on a hollow cone, even the multi-spiral Terebra and Turritella, and the bivalve Solen or razor-shell. Mr. Findon then expressed an opinion that the usual belief of some conchologists that the shell was merely a calcified portion of the mantle was quite incorrect, and supported his position by various observations on the habits of the animal and its organic connection with the shell. Taking, in detail, the construction of the shell, he first explained the character of the outer layer (or periostracum), this being a horny protective skin. Various specimens were shown with this covering *in situ*, also eroded specimens, which had lost this protection. The cellular layer, which directly underlies the periostracum, was illustrated by sections of various species, and Mr. Findon showed how the "sculpturing" had its origin in the deposition of this part of the shell. The chief constituent of this and the succeeding layer being calcium carbonate, the most common inorganic forms of this mineral were exhibited for comparison. The third (or prismatic layer) was next described, with its most complicated structure varying in the different species, the mother-of-pearl of the pearl shells and the china-like interior of the porcellaneous species being fully illustrated with suitable specimens. The structure and the form of shells were pointed out, in conclusion, as being constructed to obtain the greatest strength with the least material.

The following exhibits were placed upon the table :—A Flying-fish (*Exocetus volitans*) by Mr. Hugh Findon, and the gland of a Musk Deer by Mr. F. C. Channing, F.Z.S.

Friday, May 13th, 1904. Mr. P. Macleod Yearsley in the chair.

**Mr. Montagu F. Hobson, F.L.S., F.E.S.,** read a paper on **"Lepidoptera: their Enemies and Means of Defence."** (illustrated with named specimens mounted *in situ*). Mr. Hopson stated that in all the three stages of their life, as larva, pupa and imago, the Lepidoptera are subject to the attacks of enemies

such as various mammals, birds, reptiles, and carnivorous insects. Their chief enemies are Ichneumons, a group of the Hymenoptera, of which 310 species are known in Britain. This struggle for existence has evolved various means of defence. One of the most usual is known as " protective resemblance," which may be general or special. The Privet Hawk Moth (*Sphinx ligustri*) and the Death's Head Moth (*Manduca atropos*) harmonise with the general artistic effect of their environments and are difficult to detect resting upon their food plants. The larvæ of the Lappet Moth (*Gastropacha quercifolia*) vary in colouring to assimilate with the stem of the hawthorn upon which they rest by day. The Looper Caterpillars exactly resemble a twig; their claspers have become modified to one pair at the extreme hind part of the body, and they so grasp the twig that they hold it, stiff and rigid, for several hours. Many are dimorphic.

Hybernating Caterpillars, *e.g.*, those of the small Emerald Moth (*Iodis vernaria*), which feed on clematis, change their skins as the colour of the food-plant dies away in autumn. Certain species live in the trunks of trees, hollow stems, etc., and more or less protect themselves as internal feeders. Examples are to be found in the Goat Moth (*Trypanus cossus*), and the Leopard Moth (*Zeuzera pyrina*). A family known as Psychids manufacture little cases composed of lichen, bark, etc.

The caterpillar of the Lobster Moth (*Stauropus fagi*) upon being touched assumes a terrifying attitude and mimics the appearance of a large spider. The members of another genus (*Chaerocampa*) have large eye-like markings, and possess the power of so altering their shape that these markings are thrown into great prominence. The larva of the Puss Moth (*Dicranura vinula*) entirely changes its appearance when disturbed, withdrawing its head, inflating the surrounding red margin and bringing into view two large black spots resembling eyes, the whole effect being that of an exaggerated caricature of a vertebrate face. It also has the power of ejecting a solution of formic acid.

Larvæ living in exposed situations are usually protected by tufts of hair, which, when seized by a bird, come away. Larvæ of conspicuous colouring, such as those of the Currant Moth (*Abraxas grossulariata*) are known to be distasteful to birds.

The imago is in the greatest danger when at rest. The butterfly resting with its wings folded shows the cryptic markings on the under-side of the wings, the gay colours of the upper surface remaining hidden. The moth rests usually with the wings wrapped round the body, the upper surface of the two fore wings showing the cryptic patterns with the brightly coloured under-wings beneath

them. Examples were here shown of the Comma Butterfly, the Orange-tip at rest on cow parsley, the Buff-tip Moth resembling a broken twig, and the Red Underwing Moth.

Melanism, Mr. Hopson stated, is now being investigated by a Committee of the Royal Society. Insects which normally are of a light colouration are becoming darker, in some cases almost black in and around our large towns. A series of the Peppered Moth (*A. betularia*) varying from a very light colour to almost black, was shown from the Hampstead district, illustrating this change in colouration.

In tropical and sub-tropical countries the Danainæ, Heliconiinæ, Ithominæ and Acraeminæ are known to be practically free from the attacks of animals, which devour other Lepidoptera quite readily. These insects are gaudily coloured, but Bates, when examining captured specimens, found that many did not really belong to these families, although, at first sight, they resembled them. He then promulgated what is known as the Batesian theory. Certain species, such as Papilios, Pierids, Nymphalines, which are preyed upon by insectivorous animals, he said, have, by natural selection, come to resemble distasteful species, such as Acroea and the Heliconiinæ, and so secured a certain amount of protection by thus masquerading in the dress of a "protected species."

The following exhibits were shown :—The so-called auditory organs in the opossum Shrimp (*Mysis*) by Dr. J. W. Williams, F.L.S. ; a series of Trilobites by Mrs. Park and Mr. P. Macleod Yearsley, F.R.C.S. ; the skin of a Hornbill (*Buceros cavatus*) by Mr. Hugh Findon ; and protoplasmic streaming in the Canadian water-weed (*Elodea canadensis*) by Mr. K. I. Marks, F.R.M.S.

Friday, November 11th, 1904. Sir Samuel Wilks, Bart., F.R.S., in the chair.

**Mr. C. Nicholson, F.E.S.,** read a paper (illustrated with specimens and artificial bogs) on **"Bog Plants."** He first dealt with the nature, composition, birth, life and death of bogs, explaining that it was peat bogs about which he proposed to speak. He then proceeded to show that the conditions under which the bog-flora existed were peculiar in that the amount of soluble material in the bog-water prevented free absorption by the roots. Hence the plants resorted to various devices to check transpiration, such as development of hairs, narrowing of leaves, thickening of cuticle, etc. Moreover, the saturated soil (peat) was badly aerated, and therefore oxidization was slow, bacteria were scarce, and nitrogen difficult to obtain ; hence some species had developed insectivorous habits, providing the lacking nitrogen by catching and digesting

small flies, etc., of which there was usually a plentiful supply on bogs. He dealt briefly with the British species of Sundews, Butterworts, and Bladderworts, pointing out their salient features and the different ways in which they secured their animal food. He reminded his audience that the well-known Venus's Fly-trap (*Dionœa muscipula*) belonged to the Sundew family, and that an Italian liqueur was made from another member of the family and called Rossoli, a word derived from *Ros solis*, the Latin equivalent of sun-dew.

Mr. Nicholson then passed on to the consideration of the non-insectivorous bog-plants, explaining that he only proposed to refer to such plants as were practically exclusively confined to peat-bogs, although he admitted that in some cases it was difficult to draw the line. He omitted the cryptogams, except *Lastræa cristata* and *Osmunda regalis*, and also the sedges, grasses and rushes, confining his remarks to the five species of British Bog-Orchids and thirty-four other species of British plants belonging to twenty-three families, among which may be mentioned *Narthecium ossifragum*, *Viola palustris*, *Hydrocotyle vulgaris*, *Parnassia palustris*, *Anagallis tenella*, *Wahlenbergia hederacea*, *Sibthorpia Europœa*, and *Gentiana pneumonanthe*.

Mosses, chiefly Sphagnaceæ, were exhibited by Mrs. Beach; a series of sinistral and dextral shells by Mr. Hugh Findon; and specimens of bog plants by Mr. L. B. Hall, F.L.S.

Friday, December 16th, 1904. Sir Samuel Wilks, Bart., F.R.S., in the chair.

Three demonstrations (with specimens and blackboard sketches) were given: **"The Five Banded Snails of London,"** by **Mr. Hugh Findon**; **"Star Fishes,"** by **Mr. P. Macleod Yearsley, F.R.C.S.**, and **"The Life-story of the Barnacle"** (*Lepas anatifera*), by **Dr. J. W. Williams.**

# Photographic Section.

COMMITTEE FOR 1904.

Miss Blyth, Mrs. Winstanley, H. J. Aubrey, H. B. Curwen, Nevil Smart and J. P. Bushe-Fox (Hon. Sec.)

Quiet progress has been made in this Section during the past year, though the average attendance at the fortnightly meetings has hardly been maintained.

The members of the Section deeply regret the retirement of Mr. Bushe-Fox, owing to ill-health. Mr. Bushe-Fox has been their indefatigable secretary for many years past, and the success of the Section has been largely due to his untiring efforts. At the meeting held on the 25th January, 1905, a warm vote of thanks for his services and of sympathy with him was passed, coupled with a hearty wish that he may be soon restored to health.

The following meetings were held during the year :—

Wed. Jan. 13.—Members' Lantern Night.
Fri. 27.—Demonstration on the Gum Bichromate Process, by Mr. J. C. S. Mummery, F.R.P.S.
Wed. Feb. 10.—Some Photographic Records of the Highlands o Scotland, by Mr. Charles Beadle.
Fri. 24.—Gothic Architecture.
Wed. Mar. 9.—Members' Lantern Night.
Fri. 23.—Intensification and Reduction, by Mr. J. McIntosh.
Wed. April 13.—The Land of Windmills, by Mr. Slater, F.R.P.S.
Fri. 27.—Elementary Principals of Pictorial Photography, by Mr. J. P. Bushe-Fox.
Wed. Nov. 9.—A practical Lesson in Outdoor Photography, illustrated by Mr. Horseley Hinton's Slides.
Fri. 30.—Artistic Mounting and Framing, by Mr. C. P. Small.
Dec. 14, 15.—Annual Exhibition.

The Annual Exhibition was held as stated above on the 14th and 15th December, and was a distinct advance on any previous one. Mr. J. T. Ashby, F.R.P.S., again judged the Exhibits, and made the following awards :—

Silver medal to Mr. C. P. Small, for his portrait of Dr. Shuldham, and Bronze medal to Mr. H. J. Aubrey, for his picture "Winter Sunset."

In the Portrait and Figure Study Class certificates to Mr. H. J. Aubrey (second) and Mr. J. P. Bushe-Fox (third). In the Landscape and Seascape Class, certificates to Mr. L. R. Goodyear (second) and Mr. J. P. Bushe-Fox (third). In the Direct Contact Print Class, certificates to Mr. H. B. Curwen and Mr. Nevil Smart (bracketed first) and in the Architectural Section, certificates to Mr. Nevil Smart (first) and Mr. O. C. Duckett (second).

# Nature Study Course.

Six Lectures, with practical work for the students, were given by **Miss Clothilde von Wyss,** lecturer at the London Day Training College.

Fees for the course, to members 3s. 6d.; to non-members 5s. Admission to a single Lecture 1s.

## THE BIOLOGY OF AUTUMN.

Lecture I.—Thursday, November 3rd, 1904.

Nature myths. Life cycles. General signs of Autumn. Gossamer threads. Autumn: a period of preparation for Winter.

*Practical Work.*—Examination and detailed study of

(*a*) Spiders and spider webs.

(*b*) Coloured autumn leaves and scars on bare twigs.

Lecture II.—Thursday, November 10th.

Autumn, the season of fruiting. The perishable and the persistent parts of flowers. Contributions of other parts of the plant to the formation of the fruit: (*a*) nourishment supplied, (*b*) protection afforded.

*Practical work.*—Examination and detailed study of different kinds of fruits, leading to a simple classification of the same.

Lecture III.—Thursday, November 17th.

Autumn, the season of great mortality among animals and plants. What becomes of the dead and fallen. Work of earthworms, moulds and bacteria. Leaf-moulds, skeleton leaves.

*Practical work.*—Examination and detailed study of earthworms and toad-stools.

Lecture IV.—Thursday, November 24th.

Scattering of fruits and seeds and their adaptations for flight. Comparing and contrasting the dispersal of fruits and seeds with the migration of animals.

*Practical work.*—Examination and detailed study of different kinds of fruits and seeds, showing special adaptations for dispersal.

Lecture V.—Thursday, December 1st.

How plants provide for the future. Laying up stores. Special ways of providing for the winter in the case of animals.

*Practical work.*—Examination and detailed study of (*a*) Potato tubers. (*b*) Bulbs. (*c*) Seeds. (*d*) Buds of water-plants.

Lecture VI.—Thursday, December 8th.

The going into winter quarters of both animals and plants. Lying low for a season. Effect of hardships on animals and plants. Degeneration and evolution.

*Practical work.*—Examination and detailed study of (*a*) Mistletoe. (*b*) Roman snails and other snails.

## Christmas Juvenile Lectures.

The following Lectures for children were given during the Christmas holidays :—

Wednesday, January 6th, 1904, "The Story of the Stars," with lantern illustration. Mr. P. E. Vizard, F.R.A.S.

Wednesday, January 13th, "Earthworms," with illustrations and specimens. Miss Clothilde von Wyss.

Wednesday, January 20th, "The Story of the Bees," with lantern illustrations, Mrs. Sophie Bryant, D.Sc.

Wednesday, December 28th, "The Man in the Moon, and what he saw there," with lantern illustrations. Mr. P. E. Vizard, F.R.A.S.

Children of members were admitted free, other children on payment of 6d. each.

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### RULES OF THE SOCIETY.

Copies of the Rules may be obtained on application to the Honorary Secretary, 3, Holford Road, N.W.



## List of Members.

***Corrected to March 7th, 1905.***

**Members are particularly requested to notify any change of address to the Hon. Secretary of the Society, 3, Holford Road, Hampstead, N.W.**

HONORARY MEMBERS.

Dawkins, Prof., W. Boyd, M.A., D.Sc., F.R.S., Owen's College, Manchester
Heberden, Colonel Henry, R.A., J.P., 28, Buckland Crescent, Hampstead
Jermyn, F. Lubbock .. .. 10, Montpelier Crescent, Brighton
Martin, Basil, W., F.Z.S. .. .. Aberdeen University

## Ordinary Members.

| | |
|---|---|
| Abbott, Rev. E. A., D.D. | Well Side, Well Walk |
| Acret, Charles, F.R.G.S. | 43, Rosslyn Hill |
| Acworth, J. J., Ph.D., F.I.C., F.C.S. | Thornbank, Shoot-up-Hill |
| Adams, H. | 53, Netherhall Gardens |
| Adams, Thomas | 49, Nassington Road |
| Adams, W. Coode, M.B. | 1, Eton Avenue |
| Alcock, S. P. | 5, Rudall Crescent |
| Allcock, Miss N. | 20, Shirlock Road, Gospel Oak |
| Allen, A. Jukes | 17, Well Walk |
| Ambrose, Lawrence | Westover, West Heath |
| Anderson, Douglas | 15, South Hill Park Gardens |
| Anderson, J. W., M.D. | Fawley House, Fawley Road |
| Andrews, E. Collingwood, M.A., M.D. | 110, Finchley Road |
| Ashworth, Percy H. | 30, Heath Hurst Road |
| Aubrey, Hampton J. | 3, Fawley Road, West Hampstead |
| Avenell, George (Member of Council) | 56, Mansfield Road |
| Baily, Walter, M.A., F.Z.S. (Vice-President) | 4, Rosslyn Hill |
| Baker, F. H. | 95, Belsize Road |
| Bakewell, H. J. | 60, South Hill Park |
| Barratt, T. J. | Bellmoor, Hampstead Heath |
| Bartrum, C. O., B.Sc. (Hon. Secretary of the Society) | 3, Holford Road |
| Bartrum, Miss E. M. | 3, Holford Road |
| Bartrum, Miss M. W. | 3, Holford Road |
| Batley, H. Gurson | 21, Fellows Road |
| Beach, Mrs. C. | 11, Park Hill Road |
| Beckley, Mrs. E. M. | 21, Rosslyn Hill |
| Bell, Edward, M.A. | The Mount, Heath Street |
| Berridge, Miss A. L. | 24, Thurlow Road |
| Beves, Mrs. H. C. | 8, Holly Village, Highgate |
| Bird, Miss Alice | 6, Windmill Hill |
| Blyth, E. K. | 6, Rosslyn Hill |
| Blyth, Miss E. T. | 6, Rosslyn Hill |
| Bond, Edward, M.A., M.P. (Vice-President) | Elm Bank, Windsor Terrace |
| Boulting, William, L.R.C.P. | Shallow Farm, Breamore, Hants. |
| Boyce, Mrs. Louie E. | Grasmere, Dollis Park, Finchley |
| Bradford, Henry | 37, Trevor Square, S.W. |
| Bridger, Miss N. | 66, South Hill Park |
| Bright, Mrs. | 16, Heath Mansions, The Grove |

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|---|---|
| Brock, Hugh R. .. .. | .. 14, Frognal Mansions |
| Brown, W. Carnegie, M.D. | .. 13, Hampstead Hill Gardens |
| BRYANT, MRS. SOPHIE, D.Sc. (Vice-President) | .. 6, Eldon Road |
| Bull, J. B. .. .. .. | .. Elmleigh, Elm Row |
| Bushe-Fox, J. P. .. .. | .. Ben Lomond House, Downshire Hill |
| Butcher, Arthur .. .. | .. 46, Downshire Hill |
| Butt, Miss .. .. .. | .. 3a, Crediton Road |
| | |
| Challen, Frank .. .. | .. 20, West Hill, Highgate |
| Champneys, Mrs. .. .. | .. Hall Oak, Frognal |
| Chandler, P. W. .. .. | .. 5, Rosslyn Gardens |
| Chandler, L. Francis .. | .. 80, South Hill Park |
| Chandler, M. Howard .. | .. 80, South Hill Park |
| Channing, F. C., F.Z.S. .. | .. 62, Fellows Road |
| Chapman, Henry .. .. | .. 21, Westbere Road, W. Hampstead |
| Clarke, Henry, J.P. .. | .. Cannon Hall |
| Clarke, Miss .. .. | .. 56, Antrim Street |
| Claudet, A. C. .. .. | .. 27, Daleham Gardens |
| Clothier, Miss .. .. | .. 26, Ellerdale Road |
| Coates, Joseph .. .. | .. 13, Willoughby Road |
| Colin, Edward B. .. .. | .. 38, Rosslyn Hill |
| Colles, W. M., Junr. .. | .. 16, Birchington Road, West Hampstead |
| Cooke, A. Clement .. .. | .. 9, Minster Road, West Hampstead |
| Cooke, Mrs. A. C. .. | .. 9, Minster Road, West Hampstead |
| Cottam, G. H., M.I.E.E. .. | .. Lyndhurst, Platts Lane |
| Cross, Robert .. .. | .. West Hill Lodge |
| Cross, Mrs. Robert .. | .. West Hill Lodge |
| CRUMP, E. COMPSON (Hon. Treasurer) | .. 28, High Street |
| Cuff, Miss .. .. .. | .. 34, Lambolle Road |
| CUNNINGTON, C. W., M.R.C.S., D.P.H. (Member of Council) | 86, West End Lane |
| CURWEN, H. B. .. .. (Member of Council) | .. Enfield House, Windmill Hill |
| Curwen, J. Patrick .. | .. 49, Frognal |
| | |
| D'Ambrumenil, B. .. .. | .. 6, Gainsborough Gardens |
| Davis, R. R. .. .. | .. 3, East Heath Road |
| Deacon, Rev. A. E., M.A. | .. Christ Church Vicarage |
| Deedes, Rev. Brook, M.A. | .. The Vicarage, Hampstead |
| Dickinson, F. L. A. .. | .. 12, Ferncroft Avenue |
| Drake, Miss .. .. .. | .. 3, Inglewood House, West Hampstead |

Drummond, J. C. .. .. .. 12, Worsley Road
Drummond, Mrs. .. .. .. 12, Worsley Road
Drysdale, Mrs. .. .. .. Wick Hall, Radley, Berks
Dudman, J., Junr. .. .. .. 56, Rosslyn Hill
Dudman, G. Henderson .. .. 8, Upper Belsize Terrace
Dunbar, J. .. .. .. .. 6, Pilgrims Lane

EDGEWORTH, PROFESSOR F. Y., M.A., D.C.L. (Vice-President) 5, Mount Vernon
Edwards, Eric .. .. .. 29, Hampstead Hill Gardens
Evans, Miss M. .. .. .. 11, Ferncroft Avenue

Fairclough, Alfred N. .. .. 6, Dartmouth Road, Brondesbury
Faraday, Paul .. .. .. 8, Oak Hill Park, Frognal
Faraday, Harold .. .. .. 8, Oak Hill Park, Frognal
Fielder, Mrs. .. .. .. 6, Fellows Road
Figgis, Samuel .. .. .. Montague Grove, Frognal
Findon, Hugh .. .. .. 58, Carleton Road, Tufnell Park, N.
Flight, W. C. .. .. .. Little Bines, Burwood, Sussex
Flook, Walter .. .. .. Heathlea, Willow Road
Forbes, Mrs. .. .. .. Egremont, 16, Willoughby Road
Forster, R. H. .. .. .. Artillery Mansions, Victoria St., S.W.
Frodsham, G. W. .. .. .. 16, Kingdon Road, W. Hampstead
Fulleylove, Christopher .. .. 21, Church Row

Gabb, Miss F. M. .. .. .. 11, Lismore Circus, N.W.
Gard, W. G. Snowdon, LL. B., F.G.S., 20, Upper Park Road
Garlick, Miss .. .. .. 11, Well Road
Garnett, Richard, C.B., LL.D. .. 27, Tanza Road
GARNETT, WILLIAM, M.A., D.C.L. (Member of Council) The Wabe, Redington Road
George, W. Colville .. .. 2, Antrim House, Haverstock Hill
George, Mrs. W. C. .. .. 2, Antrim House, Haverstock Hill
Gillies, Rev. James, M.A. .. .. 8, Thurlow Road
Gillman, A. R., F.Z.S., M.B.O.U. .. 5, Fellows Road
Glanville, Miss .. .. .. Coniston, Lyndhurst Road
Godden, William .. .. .. 38, Burrard Road, W. Hampstead
Goodchild, Herbert, M.B.O.U. .. 66, Gloucester Road, Regent's Park
Goodman, Alexander .. .. 137, Adelaide Road
Goodyer, L. R. .. .. .. 6, Canterbury Mansions, West Hampstead
Gow, Rev. Henry, B.A. .. .. 3, John Street
Graham, H. Howgrave .. .. 12, Willow Road
Gray, Mrs. .. .. .. .. 3, Well Walk
Grenfell, J. S. Granville, M.A. .. Heath Mount School, Heath Street

Grundy, Edmund F. .. .. 14, Thurlow Road
Grundy, Mrs. E. F. .. .. .. 14, Thurlow Road
Gundry, Joseph .. .. .. 158, Adelaide Road
Gysi, Max .. .. .. .. Belsize Lodge, Belsize Lane

Hailston, Harold .. .. .. 91, Adelaide Road
Hall, L. B., F.L.S. .. .. .. Ivy House, Hampstead Square
Hallowes, S. M. .. .. .. Heath Fern Lodge, Heath Side
Hallowes, V. B. .. .. .. Heath Fern Lodge, Heath Side
Hannam, Miss Florence .. .. 6, Belsize Terrace
HARBEN, SIR HENRY, J.P. (Vice-President) .. .. Seaford Lodge, Fellows Road
Harcourt, R. F. Muller, M.A., F.K.C., 43, Heath Hurst Road
Harvey, S. Smith .. .. .. 1, Marlborough Mansions, Cannon Hill
Hastie, Peter .. .. .. 24, Park Hill Road
HAYNS, JOHN, F.Inst.J. (Member of Council) .. .. Campbell Cottage, 20, John Street
Heath, Miss Emily F. .. .. 7, Downside Crescent
Hemmingway, Walter .. .. 291, Finchley Road
Hepworth, P. D. .. .. .. Netley Cottage, The Grove
Holmes, Miss Lucy .. .. 41, Haverstock Hill
Homfray, Mrs. G. .. .. .. 16, Church Row
Homfray, Miss .. .. .. 16, Church Row
Hopkins, A. E. .. .. .. 35, Antrim Mansions
Hopson, Montagu F., F.L.S., F.E.S. 30, Thurlow Road
Hopson, Mrs. .. .. .. 30, Thurlow Road
Hough, E. .. .. .. .. 8, Eldon Road
Howard, George .. .. .. St. Mary's, West Finchley
Hudson, Miss Constance .. .. 22, Kemplay Road
Hunt, E. J. .. .. .. 2, Frognal Mansions
Hunt, Mrs. E. J. .. .. .. 2, Frognal Mansions
Hunter, J. W. .. .. .. 41, Lancaster Road, S. Hampstead
Hutchinson, Rev. H. N., B.A., F.R.G.S., F.G.S. 94, Fellows Road

Iles, Miss A. M. .. .. .. 16, Elsworthy Road
Inglis, C. H. .. .. .. 15, Downside Crescent

James, Leonard, M.A. .. .. 8, Lyndhurst Road
James, Mrs. .. .. .. .. 8, Lyndhurst Road
Jealous, Mrs. .. .. .. 33, Pond Street
Jefferies, Mrs. M. .. .. .. 17, Denning Road
Jessop, Edward, M.R.C.S., L.R.C.P., 81, Fitzjohn's Avenue
Jevons, Miss .. .. .. 10, Hamilton House, Hall Road, St. John's Wood

Jevons, Miss H. W. .. .. 19, Chesterford Gardens
John, William M.R.C.S., F.G.S. .. 24, Belsize Park Gardens
Johnston, Mrs. Charles .. .. 72, Fitzjohn's Avenue
Jones, A. Denman .. .. .. St. Aubyn's, The Vale
Jones, H. Sydney .. .. .. 39, Heath Hurst Road
Jones, E. Vaughan .. .. 9, Well Walk
Jones, V. Vaughan .. .. 9, Well Walk
Jones, Miss H. Vaughan .. .. 9, Well Walk
Joshua, Philip .. .. .. 45, Belsize Avenue

Kearne, S. R. .. .. .. 1, Lyndhurst Gardens
Kinder, Miss M. A. .. .. 44, Willow Road
King, Arthur H. .. .. .. Church House, Highgate, N.
King, Mrs. M. L. .. .. .. 5, Willoughby Road
Knight, G. McKenzie, F.R.A.S. .. 59, King Henry's Road

Leftwich, Hugh S. .. .. .. 13, Chatsworth Road, Brondesbury
Le Grand, J. Prowett .. .. 5, Downside Crescent
Lintern, Miss Elsie .. .. 38, Rosslyn Hill
Lister, Miss .. .. .. .. Upper Heath
Littlejohn, S. Herbert, M.B., F.R.C.S. 37, Buckland Crescent
Lown, H. F. .. .. .. 38, Netherhall Gardens
Lucey, H. C. .. .. .. 20, Christ Church Road

MacGregor, Miss H. D. .. .. 4, Prince Arthurs Road
Maconochie, Harry .. .. Heath Brow Cottage
Maconochie, Mrs. .. .. .. Heath Brow Cottage
Malcolm, W. F. .. .. .. Birnan House, Fitzjohn's Avenue
Mallam, W. A., M.R.C.S., L.R.C.P., 63, Rosslyn Hill
March, Miss M. .. .. .. 74, Park Hill Road
Marks, K. I., F.R.M.S. .. .. 9, Randolph Gardens, N.W.
Maroti, C. H. .. .. .. 22, Winchester Road, N.W.
Marshall, Alfred .. .. .. 29, Heath Hurst Road
Martin, Miss F. .. .. .. 3, Foley Avenue
Mayle, Sydney C. .. .. .. 70, High Street
Melliss, H. J., B.A. .. .. 16, Hollycroft Avenue
Mellor, F. A. .. .. .. 62, Parliament Hill
Millar, Henry E. .. .. .. Heathdown, East Heath Road
Milne, F. G. .. .. .. 75, South Hill Park
Milvain, Thomas, K.C., M.P. .. 17, Rutland Gate, S.W.
Money, C. J. .. .. .. Greenhill Flats, Perrins Court
Moore, Miss M. E. .. .. 5, Gayton Crescent
Moore, Mrs. Wm. .. .. .. 16, Denning Road
Muller, Hans .. .. .. 13, Thurlow Road
Mullins, E. G. .. .. .. Ivy Mount, Arkwright Road

Murdock, G. H. .. .. .. 31, Nassington Road
Murray, T. .. .. .. .. 57, Nassington Road

Nash, Mrs. L. Fraser, L.R.C.P & S. Edin., L.F.P.S., Glas. 136, Haverstock Hill
Naunton, Miss Louie .. .. 1, Denning Road
Neatby, E. A., M.D. .. .. 82, Wimpole Street, W.
Nicholson, C. S., F.L.S. .. .. 22, Crouch Hall Road, Crouch End, N.
Nicolson, Alexander M. .. .. Bankside, Christ Church Road
Norrie, C. M., B.Sc. .. .. 14, Maitland Park Villas

Organ, Miss Winifred C. .. .. 60, Dale Road, Gospel Oak
Orr, Miss M. S. .. .. .. 30, Heath Hurst Road

Pace, Harry .. .. .. 21, Constantine Road
Paine, F. E. .. .. .. Hillfield, Haverstock Hill
Paneti, E. T. .. .. .. 71, Adelaide Road
Park, Mrs. .. .. .. .. 19, Primrose Hill Road
Park, D. F., F.Z.S. .. .. 73a, Belsize Park Gardens
Pawling, Mrs. Sydney .. .. 55, Frognal
PAYNE, E. S. .. .. .. 45, Rosslyn Hill
(Member of Council)
Peabody, Miss Freda .. .. 23, Church Row
Pearsall, H. D., M.Inst.C.E. .. 21, Parliament Hill
Pearse, D. Colbron .. .. 14, Willow Road
Pearse, Alfred .. .. .. 14, Willow Road
Pearse, Mrs. .. .. .. 14, Willow Road
Perrins, Ronald .. .. .. 1, Kemplay Road
PETRIE, Prof. W. M. FLINDERS, D.C.L., LL.D., Ph.D., F.R.S. 8, Well Road
(Vice-President)
Petrie, Mrs. Flinders .. .. 8, Well Road
Pidcock, G. D., M.A., M.D., M.R.C.P. 74, Fitzjohn's Avenue
Player, J. H. .. .. .. 16, Prince Arthur Road
Plowman, H., F.S.A. .. .. 23, Steele's Road
PODMORE, FRANK, M.A. .. .. 6, Holly Place
(Vice-President)
Potter, G. W. .. .. .. 4, Gayton Crescent
Prance, R. H. .. .. .. 29, Netherhall Gardens
Price, W. .. .. .. .. 39, Courthope Road
Pridham, Miss .. .. .. 5, Squires Mount
Purry, Walter .. .. .. 44, Well Walk
Purry, Mrs. .. .. .. 44, Well Walk

Quekett, O. C. .. .. .. 70, Greencroft Gardens

Radford, Maitland .. .. .. 1, Portland Villas, East Heath Road
Raisin, H. W. .. .. .. 41, Heath Hurst Road
Raisin, Mrs. .. .. .. 41, Heath Hurst Road
Raisin, W. F. .. .. .. 41, Heath Hurst Road
Randall, T. Gurney .. .. 40, Englands Lane
Rayner, Henry, M.D. .. .. Upper Terrace House
Richardson, Miss Mary .. .. 13, Antrim Mansions, Haverstock Hill
Rickett, W. R., J.P. .. .. Sunnyfield, West Heath
Ridley, Miss J. .. .. .. 31, Daleham Gardens
Robins, P. S. .. .. .. 20, Greencroft Gardens
Roddick, J. R. .. .. .. 103, South Hill Park
Rogers, James .. .. .. 8, Denning Road
Rowney, W. G. .. .. .. Noel House, Gainsborough Gardens
RUDLER, F. W., I.S.O., F.G.S. (Member of Council) .. 18, St. George's Rd., Kilburn, N.W
Russell, Chas. A., K.C. .. .. 53, Netherhall Gardens
Russell, Mrs. .. .. .. 53, Netherhall Gardens

Sanders, C. G. .. .. .. 13, Platt's Lane.
Sanders, Mrs. .. .. .. 13, Platt's Lane
SCHRÖDER, WALTER (Member of Council) .. .. Telegraph Hill, West Heath
Scott, Victor .. .. .. Bank House, Willesden Green
Scull, Miss E. M. L. .. .. 10, Langland Gardens
Shackleton, Miss M. H. .. .. 20, Belsize Crescent
Sharman, Henry, M.D. .. .. Sedgemoor, Arkwright Road
SHENTON, E. W. H., M.R.C.S., L.R.C.P. (Member of Council) 7, Heath Mansions, The Grove
Shenton, Mrs. E. W. H. .. .. 7, Heath Mansions, The Grove
Sibson, A. E. .. .. .. 19, Carlingford Road
Sievers, C. .. .. .. .. 8, Kingdon Road, West End Lane
Sloper, G. Randall .. .. 24, Lymington Road
Small, P. C. .. .. .. 28, Church Row
SMART, H. NEVIL (Photographic Secretary) 40, Compayne Gardens
Smith, John .. .. .. 8, King Henry's Road
Steinberg, Miss Alice .. .. 54, Fellows Road
Steinberg, Miss C. F. .. .. 54, Fellows Road
Stevenson, Miss .. .. .. 2, Prince Arthur Road
STOKES, A. W., F.C.S., F.I.C. (Member of Council) .. 60, Park Hill Road
Stokes, Mrs. .. .. .. 60, Park Hill Road
Stopes, Miss Marie C., B.Sc., Ph.D. 25, Denning Road

Strange, R. Gordon, M.S., M.B. .. 2, Belsize Avenue
Strange, Miss .. .. .. 2, Belsize Avenue

Taylor, E. Claude, M.D., F.R.C.S., M.S. Eland House, Rosslyn Hill
TEBB, A. E., M.D., B.S., D.P.H. (Member of Council) .. 226, Finchley Road
Tebb, Mrs. A. E. .. .. .. 226, Finchley Road
Teschemacher, Mrs. .. .. .. 11, Redington Road
Thomas, G. Danford, M.D., F.Z.S., Coroner's Office, Manor Place, Paddington Green
Thompson, F. E., M.A. .. .. 16, Primrose Hill Road, N. W.
Thompson, A. Hugh, M.A. M.D. .. 26, Ellerdale Road
Thompson, Mrs. .. .. .. 26, Ellerdale Road
THOMPSON, Prof. SILVANUS, P., D.Sc., F.R.S. (Vice-President) Morland, Chislett Road, West Hampstead
Thorn, Miss E. S., B.A. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss M. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss R. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thrower, Alfred .. .. .. 1, Chalcot Gardens
Timms, Miss Julie L. .. .. 41, Haverstock Hill
Trefzger, H. .. .. .. 24, St. Mary Axe, E.C.
Turner, G. H. .. .. .. 35, Rosslyn Hill

Underdown, Herbert W. .. .. 22, Belsize Crescent
Underdown, Miss E. .. .. 22, Belsize Crescent

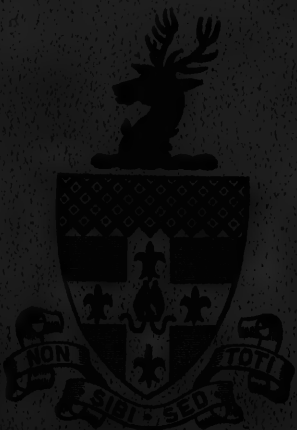
Viner, Miss F. A. .. .. .. 15, Thurlow Road
VIZARD, P. E., F.R.A.S. (Vice-President and Astronomical Secretary) .. Belsize Lodge, Belsize Lane
Vizard, W. G. .. .. .. 22, Downshire Hill

Waghorn, John .. .. .. 11, Arkwright Road
Waghorn, Mrs. J. .. .. 11, Arkwright Road
Waghorn, Miss .. .. .. 11, Arkwright Road
Wainwright, Shirley .. .. Elm Lodge, Elm Row
Wallis, Ernest .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. .. .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. Isabel White .. .. Upper Frognal Lodge
Ward, Lawrence .. .. .. 159, Broadhurst Gardens, West Hampstead
Watkins, C. A. .. .. .. 77, Fitzjohns Avenue
Watt, H. B., M.B.O.U. .. .. 3, Willow Mansions, Fortune Green Road
Watts, P. A. .. .. .. 49, Goldhurst Terrace
Weber, F.O. .. .. .. 44, Stanley Gardens

Wells, Josiah .. .. .. 1, Arkwright Road
Wesley, James H. .. .. .. 81, Fairbridge Rd., Upper Holloway
White, C. T. .. .. .. 17, Parolles Road, Upper Holloway
White, Miss Ellen .. .. .. 2, Rosslyn Mansions, Goldhurst Terrace
Whiting, James E. .. .. 41, Heath Street
Wilkins, Henry .. .. .. 17, The Pryors, East Heath Road
Wilkins, Miss .. .. .. 1, Ellerdale Road
WILKS, Sir SAMUEL, Bart., M.D., LL.D., F.R.S. (President) 8, Prince Arthur Road
Wilks, William .. .. .. 19, Denning Road
Wilks, Mrs. .. .. .. .. 19, Denning Road
WILLIAMS, J. W., M.R.C.S., L.R.C.P., F.L.S., F.R.M.S. (Natural History Secretary) 128, Mansfield Road
Williams, Mme. Lottie .. .. 38, Rosslyn Hill
Williams, Phillip H., A.C.A. .. 27, Mincing Lane, E.C.
Willis, Herbert J. .. .. .. 26, Kemplay Road
Withers, J. E. .. .. .. 49, Maresfield Gardens
WOMACK, FREDK., M.B., B.Sc. (Member of Council) .. 115, Alexandra Road
Woolf, M. Yeatman, F.E.S. .. 46, St. John's Wood Park
Woolf, Mrs. .. .. .. 46, St. John's Wood Park
Wylie, R. W., M.A... .. .. 32, Willoughby Road

YEARSLEY, P. MACLEOD, F.R.C.S., F.Z.S. (Member of Council) 10, Upper Wimpole Street, W.
Yeld, Miss M. .. .. .. 17, Platts Lane

# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY.






1905.

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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With a List of the Members.

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*For the Year* 1905.

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PRICE THREEPENCE.

Published by the Society,
STANFIELD HOUSE, PRINCE ARTHUR ROAD,
HAMPSTEAD, N.W.
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ALFRED BARNARD
PRINTERS
GRANVILLE WORKS
AYLESBURY
BRITISH MUSEUM
NATURAL HISTORY

THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

By the generous gift of Colonel Heberden, the Society is the possessor of a reflecting telescope of 10½ inch mirror, which is erected in a small observatory on the East Heath by permission of the London County Council. Particulars as to the use of the Telescope can be obtained of the Hon. Astronomical Secretary.

A General Meeting of the Society is held at the Town Hall (Small Hall), on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 p.m. precisely. Meetings of the various Sections are also held regularly at the Hampstead Library.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, of having free access to the Telescope, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretary, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned.**

C. O. BARTRUM,
*Hon. Secretary of the Society,*
3, Holford Road,
Hampstead, N.W.

*February*, 1906.

# Hampstead Scientific Society.

## *List of Officers for the Year 1906,*

Elected at the Annual Meeting, February 2nd, 1906.

**President.**

Sir SAMUEL WILKS, Bt., M.D., LL.D., F.R.S.

**Vice-Presidents.**

WALTER BAILY, M.A., F.Z.S.*
SIR GEORGE BARHAM, J.P.
Mrs. SOPHIE BRYANT, D.Sc.
Prof. F. Y. EDGEWORTH, M.A., D.C.L.
Sir HENRY HARBEN, J.P.
Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.
FRANK PODMORE, M.A.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*.)

C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS, F.I.J.
E. S. PAYNE.*
F. W. RUDLER, I.S.O., F.G.S.
WALTER SCHRÖDER.
E. W. H. SHENTON, M.R.C.S., L.R.C.P.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.
F. WOMACK, M.B., B.Sc.
P. MACLEOD YEARSLEY, F.R.C.S., F.Z.S.

**Hon. Treasurer.***
E. COMPSON CRUMP,
L. & S.W. Bank, Ltd.
High Street, Hampstead.

**Hon. Secretary.***
C. O. BARTRUM, B.Sc.
3, Holford Road,
Hampstead.

**ASTRONOMICAL SECTION:**
Hon. Secretary.*
P. E. VIZARD, F.R.A.S.
Belsize Lodge, Belsize Lane,
Hampstead.

**PHOTOGRAPHIC SECTION:**
Hon. Secretary.*
H. NEVIL SMART.
40, Compayne Gardens,
West Hampstead.

**NATURAL HISTORY SECTION:**
Hon. Secretary.*
J. W. WILLIAMS, M.R.C.S., F.L.S.
128, Mansfield Road, N.W.

* *Executive Committee.*

# Report of the Council,

## For the Year 1905.

*Read at the Annual Meeting, February 2nd, 1906.*

The Council has pleasure in reporting satisfactorily of the work of the Society during the past year. The value and interest of the lectures delivered, and the papers read and discussed, have been well sustained. During the year 32 new members have been elected. Allowing for resignations and removals the number of members is now 314.

In January the Society suffered the loss of the services of Mr. J. P. Bushe-Fox, who, for over three years, had acted as Honorary Secretary of the Photographic Section. Owing to a threatening of serious illness, he was ordered to give up immediately work of every kind. The ability and enthusiasm he devoted to the work of the Section, together with his exceptional powers as a photographer, combine in making his loss a serious one to the Society. The Council has much pleasure in recommending that Mr. J. P. Bushe-Fox be elected as Honorary Member, on account of his valuable services to the Society as Photographic Secretary, and for his work for some months as joint General Secretary.

Mr. H. Nevil Smart has kindly undertaken the position of Honorary Secretary of the Photographic Section in the place of Mr. Bushe-Fox.

The Council records with regret the death of the Rev. F. A. Walker, D.D., who in 1901 presented a collection of insects, and did useful work for the Society. It also regrets the loss by death of Mr. Alec Rabone, who for some time acted as Honorary Secretary of the Astronomical Section, and in that position rendered valuable service.

The accounts of the Society have been duly audited for the year 1905. A statement of Receipts and Expenditure will be found on pages 8 and 9. In order to place the finances on a more satisfactory basis, and to wipe off the accumulated deficit of the previous three years, a course of stringent economy has been followed. The result is satisfactory. Not only has the ordinary income from subscriptions and entrance money increased, but the expenditure has been considerably reduced. It must not be overlooked, however, that this result has been largely due to voluntary help, which may not always be available. The Honorary Treasurer gratefully reports that among the subscriptions there were 13 at 21/-, 4 at 20/-, 1 at 15/-, 14 at 10/6, 38 at 10/-, 30 at 7/6, 1 at 6/6, 5 at 6/-, 2 at 5/6. The Society is indebted to the President, Sir Samuel Wilks, for obtaining a number of special donations, which, together with the saving effected in the year's working, enables the outstanding deficit to be largely reduced. The Society is also indebted to three members for the gift of lantern appliances costing over nine pounds. Dr. Williams has again generously borne the expenses of printing and posting for the Natural History Section.

Thirty-two meetings have been held during the year, including three vacation meetings; and, in addition, there were given four Christmas Juvenile lectures, and a course of six lectures on Nature Study. The proceedings at the General and Sectional Meetings will be found on pages 10 and 22.

Particulars of the three vacation meetings will be found on page 22.

The course of Christmas lectures to children again proved a successful feature of the year's work (see page 27). The second course of six lectures on Nature Study, with practical work, for the encouragement of the teaching of this subject among children, and as a guide to such teaching, was given by Miss Clothilde von Wyss. Much interest was again shown and the course was well attended by parents and teachers and others (see page 26). These courses entailed no burden on the ordinary funds of the Society.

# STATEMENT OF ACCOUNTS.

*For the Year ending 31st December, 1905.*

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1905 Subscriptions paid in 1904, brought forward ... ... ... ... 16 8 0 | | | |
| 1905 Subscriptions... ... ... ... 81 9 6 | | | |
| | 97 | 17 | 6 |
| 1904 Subscriptions paid in 1905 ... ... ... | 0 | 15 | 0 |
| 1903 ,, ,, ,, ... ... ... | 0 | 10 | 0 |
| Conversazione Tickets ... ... ... ... | 3 | 4 | 0 |
| Juvenile Lectures... ... ... ... ... | 4 | 0 | 0 |
| Nature Study Lectures ... ... ... ... | 10 | 9 | 8 |
| Ordinary Receipts during 1905 ... ... ... | 116 | 16 | 2 |
| Donations— | | | |
| Sir. Samuel Wilks, F.R.S. ... ... 2 2 0 | | | |
| Miss C. James ... ... ... ... 2 2 0 | | | |
| Mrs. Hallett ... ... ... ... 2 2 0 | | | |
| Mr. P. E. Vizard ... ... ... 0 10 0 | | | |
| For Lantern Lens ... ... ... 3 14 0 | | | |
| For Screen ... ... ... ... 1 5 0 | | | |
| For Electric Burner ... ... ... 3 6 1 | | | |
| For Lantern Box, etc ... ... ... 0 15 0 | | | |
| | 15 | 16 | 1 |
| | 132 | 12 | 3 |
| Present Deficit ... ... ... ... ... | 9 | 13 | 7 |
| | £142 | 5 | 10 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... | 13 | 8 | 6 |
| Printing Report ... ... ... ... ... | 9 | 12 | 0 |
| Rent Town Hall ... ... ... ... ... | 10 | 10 | 0 |
| Rent Stanfield House ... ... ... ... | 11 | 18 | 0 |
| Advertisements ... ... ... ... ... | 4 | 19 | 0 |
| Photo Section ... ... ... ... ... | 8 | 19 | 6 |
| Astronomical Section ... ... ... ... | 0 | 10 | 0 |
| Nature Study ... ... ... ... ... | 4 | 16 | 3 |
| S.E. Union of Scientific Societies ... ... | 0 | 7 | 6 |
| Clerical Assistance ... ... ... ... | 2 | 2 | 0 |
| Stamps for Receipts ... ... ... ... | 0 | 10 | 0 |
| Conversazione ... ... ... ... ... | 7 | 6 | 0 |
| Postages ... ... ... ... ... ... | 13 | 4 | 4 |
| Sundry Expenses, per Hon. Secretary (included in "Epitome") ... ... ... | 16 | 11 | 4 |
| Ordinary Expenditure during 1905 ... ... | 104 | 14 | 5 |
| Lens ... ... ... ... ... 3 14 0 | | | |
| Screen ... ... ... ... ... 1 5 0 | | | |
| Burner ... ... ... ... ... 3 6 1 | | | |
| Box, etc., for Lantern ... ... ... 0 15 0 | | | |
| | 9 | 0 | 1 |
| | 113 | 14 | 6 |
| Deficit brought forward ... ... ... | 28 | 11 | 4 |
| | £142 | 5 | 10 |

Subscriptions in hand for 1906 paid in 1905, £8 19s. 0d.

E. COMPSON CRUMP, *Hon. Treasurer.*
26th January, 1906

*Audited and found correct,* { E. S. PAYNE, WALTER SCHRÖDER.

# EPITOME OF EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| General Expenses, Printing, etc. .. .. .. .. .. .. | 36 | 3 | 7 |
| Astronomical Section .. .. .. .. .. .. .. | 3 | 9 | 0 |
| Natural History Section .. .. .. .. .. .. .. | 1 | 6 | 6 |
| Photographic Section .. .. .. .. .. .. .. | 14 | 14 | 0 |
| Children's Lectures .. .. .. .. .. .. .. | 2 | 19 | 7 |
| Nature Study Lectures .. .. .. .. .. .. .. | 10 | 7 | 0 |
| Conversazione .. .. .. .. .. .. .. .. | 14 | 2 | 6 |
| Report .. .. .. .. .. .. .. .. .. | 10 | 8 | 0 |
| Advertisements .. .. .. .. .. .. .. .. | 4 | 7 | 0 |
| Clerical Assistance .. .. .. .. .. .. .. | 4 | 12 | 0 |
| Notice Board "Rent" .. .. .. .. .. .. .. | 0 | 5 | 0 |
| Lantern .. .. .. .. .. .. .. .. .. | 2 | 0 | 3 |
| | £104 | 14 | 5 |

# Abstract of Proceedings.

1905.

## General Meetings.

Friday, January 6th. Sir Samuel Wilks, Bt., M.D., F.R.S. President, in the Chair.

**Professor Marcus Hartog, D.Sc.,** gave a lecture on **"The End and Beginning of Individuality, as shown in the Living Cell,"** illustrated with lantern slides. The lecturer remarked that all living organisms grow, but any body that increases in size and retains the same form reduces the surface relative to bulk. To take a simple case, a cube one inch long has a bulk of one cubic inch, and a surface of six square inches; a cube two inches long has a surface of twenty-four square inches and a bulk of eight cubic inches, that is, its surface is only three square inches per cubic inch of bulk—it has only half the relative surface of the inch cube. Hence organisms cannot increase beyond a certain limit in size. All organisms are built up of units called cells, and the same law of limit applies to them. When they attain a certain size they divide into two or more. The original cell is called the mother-cell, and the two new ones are the daughter-cells. In this case the individuality of the parent is merged into that of the two offspring. A cell consists of a body of so-called "cytoplasm," and a central mass, the "nucleus." There are two modes in which anything can be halved. You may "halve your purse" by seeing the amount and giving half that amount to your friend, or you may see how many coins of each denomination you have, and divide these into equal shares—the latter is called "partitive" or "distributive" division. The cytoplasm of the cell divides after the first mode, the nucleus after the second. The lecturer then explained with diagrams the mode in which this division takes place in the two cases, that of the cytoplasm being by simple constriction, that of the nucleus being too complicated to be intelligible without figures. To effect the distributive nuclear division a curious "field of force" appears in the cytoplasm, he said, which may be paralleled by that of two isolated poles of magnetic or electrostatic force. This was shown by

photographs of the dividing egg-cell of a worm—the starting-point of the young—and of a layer of a mixture of iron filings and glycerine over the unlike poles of two vertical magnets. Some organisms never really rise above the state of simple cells. Such are the Trypanosomes that cause sleeping-sickness, and the organisms that produce malarial fever. The life-cycle of the latter was explained and illustrated, and it was shown that at a certain stage a new cell is formed by the fusion of two. In this case we have to do with the creation of a new individuality, not merely the multiplication of an existing one. This process is called fertilisation. A cell formed in this way, the "fertilised egg," is the starting-point of every animal and every plant, such as we see them. This new cell divides repeatedly, and the resulting cells do not separate, but remain associated, and become differentiated to build up the young organism. It might be objected that the study of such minute structures cannot be of any practical use; but the study of cell division is at the present time shedding a strong light on the problem of mixed heredity in the highest animals, and on the nature of cancer. Still, apart from any practical result, it was the vocation, often irresistible, of the scientific worker to cultivate his own little garden patch, to use the phrase of Voltaire's Candide, irrespective of whether the results would be of practical use, and the observers who had so advanced the young science of cytology—barely thirty years old—had studied patiently from this impulse pure and disinterested.

On Friday, February 3rd, the Annual General Meeting was held, under the presidency of Sir Samuel Wilks, Bt., F.R.S., the President. The Report of the Council was read and adopted. The President, Officers and Council were elected.

The meeting was resolved into an ordinary meeting.

**Principal Reginald S. Clay, B.A., D.Sc.,** gave a lecture entitled **"The Peculiarities and Paradoxes of Fluid Motion."** The lecturer made a number of experiments showing the change of pressure of driven air accompanying change of velocity, and the unexpected results to those who were not conversant with the causes. For instance, he showed that if one blew hard through a funnel, in the cup of which had been placed a light ball, the latter instead of being blown away, as might be expected, remained firmly fixed against the hole from which the air was being sent out, and the harder one blew the more firmly it remained. It was only when one left off blowing that the ball fell out of the funnel. The explanation was that the pressure in the wider part

was much greater than in the narrow part. The air was coming out of a narrow tube and passing into a wider and wider part. Thus the pressure got greater and greater towards the mouth of the funnel. Finally it came to free air, and had therefore the ordinary atmospheric pressure. The ball was subject to a sort of tug-of-war, or rather push-of-war. On one side there was atmospheric pressure, and on the other smaller pressure, and, as the stronger would win, the ball would be pushed into the funnel. The lecturer showed a number of further experiments displaying simple variations of the same principle, and also offered some remarks upon the subject of vortex rings and their curious mechanical effects, all of which he illustrated by experiments.

Tuesday, March 7th, Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

**Mr. Frank Podmore, M.A.,** gave a lecture on **"The Evidence for Spiritualism."** He first gave a brief history of the growth of Spiritualism, which he described as " the new religion." In a few years, he said, its adherents were estimated to number over two millions, and at one period there were about 100 newspapers and periodicals published in its furtherance, in English, French, German, Spanish and Italian. Even in the present year two new periodicals had been added to that number. It would be doing an injustice to modern Spiritualism to say that it was based primarily on the miracles; it was really based on the trance revelations. He proposed to examine the evidence of these miracles. To properly appreciate the full significance of such a subject they must combine the two methods of study, scientific and historical. He gave a brief sketch of the " pedigree " of the trance revelations, dealing particularly with those of Andrew Jackson Davis, an American shoemaker's apprentice, who was an exceptionally good medium, and who, although almost illiterate, dictated, while in a hypnotic state, and at various periods extending over a year, a series of discourses upon very learned subjects. He then turned to the miracle side of the subject, and endeavoured to show how all the so-called miracles were, in fact, frauds. He described what took place at dark séances, and said that the mystification of people at what then took place was accounted for partly by the fact of darkness, and partly by the fact that people seemed to attach an almost superstitious importance to the holding of hands as a proof against trickery. He then described how the medium on such occasions insisted on placing his hands so as to touch those of his neighbours in a certain way, and illustrated

by a simple experiment, how it was possible for the medium to get one or even both of his hands free to do certain acts which were afterwards ascribed to the spirits. That was, he said, almost the entire secret of the early séances. If the students on either side of the medium were too sharp for him to get his hands free he had other methods. Most mediums were very "handy" with their feet, and, failing them, they had a mouth full of teeth with which they could do certain things to mystify their inquirers. The first lesson learnt by an investigator was that no experiment made at a dark séance had any value whatever. The lecturer then described a "miracle" which took place in a photographer's studio. Two ordinary photographer's cards were shown by the medium, so that those present could see that there was nothing on them. The medium then tore two corners off the cards, and handed the corners to the lecturer, who placed them in his pocket. They then sat down in the dark for the experiment, and in a short time the "spirits" were supposed to work, and the cards were subsequently found to have small artistic paintings upon them. Those paintings were too good to have been done in the dark in a few moments, and what happened was that the medium substituted two other cards which had been painted on before. The secret of the "miracles" of knot-tying in endless cords was also to be found in similar substitution. The slate-writing trick was also easily explained, and he was astonished at the wholesale way in which people were deceived by it. But the slate-writing medium was very seldom found out. Unlike the ordinary conjuror, he could always decline to act if the conditions were not favourable or if he thought there was a likelihood of being found out. It was no discredit to a spirit medium if the "spirits" declined to act. He then illustrated the simple way in which the slate trick was performed, and said that the secret of all such tricks was in knowing how best to distract the visitor's attention, and in the medium knowing how far he could go. He then spoke on the subject of the experiment which took place in the laboratory of Sir William Crookes, in the presence of Sir William and others. A spring balance was placed in such a position that no amount of pressure at the end of the board at which the medium sat could depress the balance at the other end. The hands and feet of the medium were tied, and, notwithstanding this, the balance showed a pressure at the end away from him of from three to six pounds. First of all, he said, Sir William Crookes was not a conjuror; he was an honest man and no match for a practised conjuror. In the second place, the conditions of the experiment were dictated by the medium. In writing his account of the

experiment Sir William Crookes made an important omission. He said nothing about the position of the light and the degree of the illumination. No doubt the room was darkened, and he (the lecturer) had no doubt that what light there was was at the back of the medium, so that his legs would be in the shadow of his own body. Then he felt sure in his own mind that the balance was worked by the medium by some such means as a black thread fastened to the leg of his trousers. He could not say positively that this was how the trick was done, but he did say that Sir William Crooke's record was not nearly sufficient evidence of the manifestation of psychic force. The untrained human senses were no match for the trained conjuror, and all such experiments should be tested by mechanical contrivances and not rest on a deception of the senses. Material "miracles" could be investigated and found to be wrong. The real spiritual things that were not visible could not be so explained. The whole world was miraculous, or there was no miracle at all.

Friday, April 7th, Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

**Mr. Edward Clodd** gave a lecture entitled **"Savage Philosophy in Folk Tale."** The lecturer, introducing the subject of Saga and nursery tales, said that the pastimes of children everywhere were found to mimic the serious pursuits of men. The existence of a number of folk and fireside tales of hoary age and world-wide distribution, in which a common set of incidents was present, or, more important, in which a fundamental idea was prominent, invited the application of what was known as the scientific method—observation, comparison, and classification. It would be seen that, in the case of the nursery tale, it often had at its core some fragment of barbaric philosophy of things which had been a ruling influence for weal or woe upon folk at low stages of culture. That could be drawn from a group of stories of which the German "Rumpelstiltskin" was the most familiar type. That well-known old folk-tale had no rival until its Suffolk variant, "Tom Tit Tot" appeared in the "Ipswich Journal" of January 15th, 1878, written in the archaic and racy dialect of East Anglia. The lecturer here read this story in dialect. The central idea of the story is that the name of any being, from the great Gods of the heavens, through all the gradation of spirits, down to mortal men and women, is an integral part of that being, and, what was of supreme importance, that whoever could find out the name had the god or godling, the fiend or mortal, in his power. This

of the land is preserved under water, and may eventually form new sedimentary rocks. Deposition is correlative with denudation. If the submarine deposits are to form dry land there must clearly be a change in the relative level of land and water. Whilst some authorities assume that the sea-level has fallen, it is rather the elevation of the land that is suggested by such phenomena as those of "raised beaches." By means of earth movements the rocks may be thrown into folds, which have a marked effect on scenery. Under great superincumbent weight of rock, folding may occur without fracture, as in the flow of solids. The uppermost part of the earth's crust forms a zone of fracture, whilst at great depths there may be a zone of flowage. Fractures may give rise to faults, and these dislocations in some cases affect scenery, though they frequently have but curiously little direct effect on surface features. An elevated block of land bounded by faults, along which the lateral masses have fallen, constitutes a "horst." The physical structure of Scotland was briefly described, and attention called to the great N.E. boundary faults, the Highlands forming a horst and the Midland Valley a great fault-bounded depression. The Caledonian structural lines (N.E.) were contrasted with the Charnian folds (N.W.). Rock sculpture is chiefly effected by agents of meteoric or subaërial denudation. Æolian erosion often tends to give isolated masses a tapering base, whilst pluvial denudation tends rather to produce tapering summits, as illustrated by earth pillars. Frost and thaw and glacial action were noted as agents in the formation of scenery. Rain and rivers usually produce superficial concavities, while ice may form convexities, and the sea tends to produce a plain. Streams either excavate valleys or form alluvial plains, according to their velocity. The northern and western parts of Britain are formed of ancient rocks (Palæozoic or earlier), which are usually much indurated, folded, and invaded by igneous rocks; whilst the southern and eastern parts are mainly formed of newer rocks (Neozoic), which are less hard, less disturbed, and not associated with the igneous rocks. Hence a marked difference in the scenery of the two divisions. Thus the coast on the N.W. is characterised by high cliffs and jutting headlands, that on the S.E. by low shores and rounded contours. Inland the N.W. consists mostly of mountain masses and barren moorlands; the S.E. of fertile plains and gently undulating uplands. Again, the rivers of the N.W. are generally short and rapid; those of the S.E. long, sluggish and navigable.

The Society is indebted to the Editor of the *Hampstead and Highgate Express* for assistance in reporting the above meetings.

## Outdoor Meetings.

On Thursday, July 6th, by the kind permission of the Earl of Mansfield, the grounds of Ken Wood were open to members from 3 to 8 p.m. At 6 p.m. Mr. P. E. Vizard and Mr. James E. Whiting conducted a party through the grounds.

On Thursday, July 27th, a ramble was taken in Bishop's Wood, by permission of the Ecclesiastical Commissioners. Members and their friends met at 5.30 at the house of Mr. Herbert Nield, J.P., M.P., Bishop's Avenue, who kindly provided tea. As on the last occasion in 1903, when a meeting was arranged in Bishop's Wood, the weather proved very wet.

On Saturday, October 14th, a visit was paid to the Museum of the Royal College of Surgeons, Lincoln's Inn Fields. Mr. R. H. Burne, Anatomical Assistant, kindly showed the party over the Museum.

A Field Meeting and ramble on the borders of the Buckinghamshire chalk country that had been arranged for Saturday, June 17th, did not take place, owing to the day being very wet.

## Astronomical Section.

The following Lectures were given during the year :—

Friday, March 24th.—"The Story of the Planets and Planetary Discovery," by Mr. P. E. Vizard, F.R.A.S.

Old Ideas ; Planets known to the Ancients ; Names of the Days of the Week ; Description of Mercury, Venus, Mars, Jupiter, Saturn ; Sir W. Herschel and the Story of the Discovery of Uranus ; of the Minor Planets ; of Neptune ; of the New Star in Perseus ; Discovery by Photography.

Friday, March 31st.—"The Telescope: its History and Construction," by Mr. Harold W. Raisin, B.Sc.

Story of the Discovery of the Telescope ; Action of Concave and Convex Mirrors and Lenses in reflecting and refracting Light ; Magnification and Inversion of Images ; Construction of Telescope ; Different kinds of Telescopes, Refractors and Reflectors, Newtonian, Cassegrainian, etc. Some account of the chief Telescopes and Observatories of the World.

Thursday, November 16th.—"Eclipses in General," by Mr. P. E. Vizard, F.R.A.S.

Description of Total, Partial and Annular Eclipses; How caused; Eclipse Months; The Saros; Knowledge gained by Eclipses as to the Constitution of the Sun; its Corona, Chromosphere, Prominences, etc.; Terror inspired by Eclipses amongst the Uncultured; Accounts of Ancient Eclipses; Eclipses in the Bible.

Thursday, November 23rd.—"The Total Eclipse of Last August," by Mr. Harold W. Raisin, B.Sc. (who witnessed the eclipse from Burgos in Spain).

The Track of the Belt of Totality over the Globe; The various Expeditions for Observation, to Labrador, Spain, Majorca, Algeria and Egypt; The Astronomical Camp; Various Instruments used; How Observations made; Eclipse Festivities; Cathedral and City of Burgos; Foreign Parties at Burgos; Probable Results.

## Natural History Section.

Committee for 1906.—Geo. Avenell, Hugh Findon, F.L.S., Herbert Goodchild, M.B.O.U., M. F. Hopson, F.L.S., F.E.S., C. S. Nicholson, F.L.S., P. Macleod Yearsley, F.R.C.S., F.Z.S., and J. W. Williams, F.L.S., F.R.M.S. (*Honorary Secretary*).

This Section has made considerable progress in the past session, not only in increase of numbers but in the educational value of the work done. Several of the members have published original papers in various *Transactions*, thus elevating the section to a proper scientific status. It is hoped that others will emulate their good example.

All the meetings have been well attended. But as in the last Report, so in this, it would, perhaps, be as well for the committee to lay great stress on the value of association with old workers. Some few of the members, who could and would be willing and valuable workers, are either too diffident or too shy to come forward and look at the exhibits. They leave the meeting without seeing them, and still wish to learn and work. Natural history cannot be taught in this way. The things of Nature can be handled; they can as a rule be kept alive in what can be made an almost perfect environment; and by this means the life-story of any plant or animal can be watched and recorded. It is even

a truism in these so-called days of advanced scientific culture that we do not know the whole story of the commonest animal or of the commonest plant, and it is earnestly hoped by the committee that, during the coming summer months, much may be done by individual members in this direction, and thereby some knowledge rendered to the science of biology.

Friday, January 13th, 1905. Sir Samuel Wilks, Bart., F.R.S., in the chair. **Mr. Cecil Revis, F.C.S.,** gave a lecture (illustrated with lantern slides) on **"The Rôle of Bacteria in the Production of Milk Products."**

Friday, February 10th, 1905. Sir Samuel Wilks, Bart., F.R.S., in the chair. A lecture (illustrated with lantern slides) was given by **Mr. P. Macleod Yearsley, F.R.C.S., F.Z.S.** entitled **"Man and Monkeys."**

Friday, March 10th, 1905. Sir Samuel Wilks in the chair. **Mr. P. Macleod Yearsley, F.R.C.S., F.Z.S.** gave the second series of his **"Studies in Echinoderms,"** dealing chiefly with sea-urchins. **Mr. Herbert Goodchild, M.B.O.U.,** gave a lecture (illustrated with lantern slides) on **"A Naturalist in the Deer Forests."**

Friday, April 13th, 1905. This meeting was made into a general one, (see General meetings, p. 16) **Sir Samuel Wilks, Bart., F.R.S.,** gave a lecture on **"Spirals in Nature and in Art."**

Friday, May 12th, 1905. Sir Samuel Wilks, Bart., F.R.S., in the chair. Three demonstrations were given. One was by **Sir Samuel Wilks** on **"Ambidexterity;"** another by **Mrs. Park** on **"Trilobites;"** and the third by **Mr. M. F. Hopson, F.L.S.,** on **"The Small Cabbage White Butterfly** (*Pieris brassicæ*)."

Friday, November 10th, 1905. Sir Samuel Wilks, Bart., F.R.S., in the chair. A lecture (illustrated with lantern slides) was given by **Dr. J. W. Williams, F.L.S., F.R.M.S.,** on **"Sea-squirts; their organization and place in Nature."**

Friday, December 8th, 1905. Sir Samuel Wilks, Bart., F.R.S., in the chair. **Mr. Hugh Findon, F.L.S.,** read a paper (illustrated with many exhibits) entitled **"The Haunts and Habits of the Mollusca,"** and referred not only to land and fresh-water species, but to those which are exclusively marine.

# Photographic Section.

COMMITTEE FOR 1905.

Miss Blyth, Miss Homfray, H. J. Aubrey, H. B. Curwen, O. C. Quekett, R. W. Wylie and H. Nevil Smart (Hon. Sec.)

Several new members have joined this Section during the year, and the average attendance at the fortnightly meeting is gradually increasing. The Circulating Portfolios, under Miss Blyth's superintendence—a system whereby a member submits his work to the candid criticism of his fellows—is a valuable aid to improvement in work.

A Summer outing was held on June 3rd, when an excursion was made to Chenies. An award offered for the best picture then obtained, was won by Miss Blyth.

The following meetings were held during the year :—

Wed. Jan. 25.—"Record Photography," by Mr. E. Scamell.
Wed. Feb. 8.—Demonstration of Bromide Enlarging, by Mr. Austen.
Wed. Feb. 22.—Members' Lantern Night.
Wed. March 8.—"The Essentials of Artistic Photography," by Mr C. P. Small.
Wed. March 29.—"A Chat about Lenses," by Mr. R. W. Wylie, M.A.
Wed. April 12.—"Platinotype Printing," by Mr. H. B. Curwen.
Wed. May 3rd.—"Demonstration Bromide Toning," by Mr. W. Hemingway.
Wed. No. 8.—"Demonstration on Bromide and Gaslight Papers," The Rotary Photographic Company, Ltd.
Fri. Nov. 24.—"Demonstration Development for Beginners," by Mr. H. Nevil Smart.
Dec. 6–7.—Annual Exhibition.

Mr. H. B. Curwen won the certificate for the best slide shown on the Members' Lantern Night.

The Annual Exhibition was visited by a large number of members and friends. An excellent series of photographs was shown, but the absence of work by Mr. J. P. Bushe-Fox, who was away through illness, and by Mr. C. P. Small, who was acting as judge, was a misfortune.

Mr. C. P. Small made the following awards :—

Silver medal to Mr. H. J. Aubrey, for his picture "A Stormy Light"; Bronze medal to Mr. R. W. Wylie for his picture "Salisbury."

Certificates.—In the Portrait and Figure Study Class, none. In the Landscape and Seascape Class (first), to Mr. H. J. Aubrey, Miss Blyth, Mr. H. B. Curwen. In the Direct Contact Print Class (second), to Mr. H. J. Aubrey and Mr. H. B. Curwen. In the Architectural Section (second), to Mr. P. A. Watts and Mr. P. H. Williams. A "special" certificate was awarded to Mr. O. C. Quekett for his copy of the engraving "Alte de Chasseurs."

## Nature Study Course.

Six Lectures, with practical work for the students, were given by MISS CLOTHILDE VON WYSS, lecturer at the London Day Training College.

Fees for the course, to members 3s. 6d.; to non-members 5s. Admission to a single Lecture 1s.

### SYLLABUS.

### THE BIOLOGY OF SPRING.

Lecture I.—Thursday, February 9th.

Introduction. General Survey of the state of things in Nature from the biologist's point of view. Spring: the season of awakening.

*Practical work.*—Detailed examination and comparison of various kinds of seeds, leading to a knowledge of the characteristic structure of seeds.

Lecture II.—Thursday, February 16th.

Germination of seeds. Conditions which are necessary for the germination of seeds. Experiments to illustrate the conditions of germination.

*Practical work.*—Closer study of the experiments used in the lecture and drawing of apparatus. Selection of experiments suitable for class work in schools.

Lecture III.—Thursday, February 23rd.

Seeds of animals and eggs of plants compared. Nest-building. Maternal instinct.

*Practical work.*—Setting up of simple experiments necessary for the study of the growth of seedlings.

Lecture IV.—Thursday, March 2nd.

General awakening of animal life. Gambols of young things. Early risers in the pond. Caddis-worm and its life-history. The water-snail.

*Practical work.*—Detailed examination of caddis-worm and its case. Study of the water-snail.

Lecture V.—Thursday, March 9th.

The aquarium and vivarium, and the place they take in nursery and schoolroom. Frogs and Toads and their life-history.

*Practical work.*—Study of frog and of toad, and if possible of their young.

Lecture VI.—Thursday, March 16th.

The unpacking of winter buds. Ascent of sap. Green fire. Early spring flowers.

*Practical work.*—Examination of the structure of typical spring flowers. Simple classification.

## Christmas Juvenile Lectures.

The following Lectures for children were given during the Christmas holidays :—

Wednesday, January 4th, "Soap Bubbles and the Forces that Mould them," with lantern illustrations and experiments. Dr. F. Womack, M.B., B.Sc.

Wednesday, January 11th, "How to make Light and Fire," with experiments. Mr. A. W. Stokes, F.C.S., F.I.C.

Wednesday, January 18th, "The Awakening of the Snowdrop," with lantern and experiments. Miss Clothilde von Wyss.

Thursday, December 28th, 1905, "Our Sun and his Family," with lantern illustrations. Mr. P. E. Vizard, F.R.A.S.

Children of members were admitted free, other children on payment of 6d. each.

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### RULES OF THE SOCIETY.

Copies of the Rules may be obtained on application to the Honorary Secretary, 3, Holford Road, N.W.

# List of Members.

***Corrected to March 2nd, 1906.***

**Members are particularly requested to notify any change of address to the Hon. Secretary of the Society, 3, Holford Road, Hampstead, N.W.**

## Honorary Members.

Bushe-Fox, J. P. .. .. .. Ben Lomond House, Downshire Hill, N.W.
Dawkins, Prof., W. Boyd, M.A., D.Sc., F.R.S. Owen's College, Manchester
Heberden, Colonel Henry, R.A., J.P., 28, Buckland Crescent, Hampstead
Jermyn, F. Lubbock .. .. 10, Montpelier Crescent, Brighton
Martin, Basil, W., F.Z.S. .. .. Aberdeen University

## Ordinary Members.

Abbott, Rev. E. A., D.D. .. Well Side, Well Walk
Acret, Charles, F.R.G.S. .. .. 43, Rosslyn Hill
Acworth, J. J., Ph.D., F.I.C., F.C.S. Thornbank, Shoot-up-Hill
Adams, H. .. .. .. .. 53, Netherhall Gardens
Adams, W. Coode, M.B. .. .. 1, Eton Avenue
Alcock, S. P. .. .. .. 5, Rudall Crescent
Allcock, Miss N. .. .. .. 20, Shirlock Road, Gospel Oak
Allen, A. Jukes .. .. .. 17, Well Walk
Anderson, Douglas .. .. .. 103, South Hill Park Gardens
Ashworth, Percy H. .. .. 30, Heath Hurst Road
Aubrey, Hampton J. .. .. 3, Fawley Road, West Hampstead
Avenell, George .. .. .. 56, Mansfield Road

Baily, Walter, M.A., F.Z.S. (Vice-President) .. 4, Rosslyn Hill
Baker, F. H. .. .. .. 95, Belsize Road
Bakewell, H. J. .. .. .. 60, South Hill Park
Barham, Sir George, J.P. (Vice-President) 112, Haverstock Hill
Barratt, T. J. .. .. .. Bellmoor, Hampstead Heath
Bartrum, C. O., B.Sc. (Hon. Secretary of the Society) .. .. 3, Holford Road
Bartrum, Mrs. J. E. .. .. 12, Bentinck Terrace, Regent's Park
Bartrum, Miss E. M., B.A. .. 3, Holford Road

Bartrum, Miss M. W. .. .. 3, Holford Road
Beach, Mrs. C. .. .. .. 11, Park Hill Road
Beckley, Mrs. E. M. .. .. 21, Rosslyn Hill
Bell, Edward, M.A. .. .. The Mount, Heath Street
Berridge, Miss A. L. .. .. 24, Thurlow Road
Beves, Mrs. H. C. .. .. .. 8, Holly Village, Highgate
Bird, Miss Alice .. .. .. 6, Windmill Hill
Blyth, E. K. .. .. .. 6, Rosslyn Hill
Blyth, Miss E. T. .. .. .. 6, Rosslyn Hill
Boulting, William, L.R.C.P. .. Shallow Farm, Breamore, Hants.
Boyce, Mrs. Louie E. .. .. Grasmere, Dollis Park, Finchley
Bradford, Henry .. .. .. 37, Trevor Square, S.W.
Bright, Mrs. .. .. .. .. 16, Heath Mansions, The Grove
Brown, W. Carnegie, M.D. .. 13, Hampstead Hill Gardens
Browne, Miss E. .. .. .. 4, Holford Road
BRYANT, MRS. SOPHIE, D.Sc. .. 6, Eldon Road
(Vice-President)
Buchanan, Edward .. .. 2, Rosslyn Gardens

Carter, William, M.A. .. .. 9, Canfield Gardens
Challen, Frank .. .. .. 20, West Hill, Highgate
Champneys, Mrs. .. .. .. Hall Oak, Frognal
Chandler, P. W. .. .. .. 5, Rosslyn Gardens
Channing, F. C., F.Z.S. .. .. 62, Fellows Road
Chapman, Henry .. .. .. 21, Westbere Road, W. Hampstead
Clarke, Miss .. .. .. .. 4, Wellington Place, N.W.
Clarke, Henry, J.P. .. .. Cannon Hall
Claudet, A. C. .. .. .. 27, Daleham Gardens
Clothier, Miss .. .. .. 26, Ellerdale Road
Coates, Joseph .. .. .. 13, Willoughby Road
Colin, Edward B. .. .. .. 38, Rosslyn Hill
Cooke, A. Clement .. .. .. 9, Minster Road, West Hampstead
Cooke, Mrs. A. C. .. .. 9, Minster Road, West Hampstead
Cottam, G. H., M.I.E.E. .. .. Lyndhurst, Platts Lane
Cross, Robert .. .. .. West Hill Lodge
Cross, Mrs. Robert .. .. West Hill Lodge
CRUMP, E. COMPSON .. .. 28, High Street
(Hon. Treasurer)
Crump, Mrs. E. C. .. .. 28, High Street
Cuff, Miss .. .. .. .. 34, Lambolle Road
CUNNINGTON, C. W., M.R.C.S., 86, West End Lane
D.P.H. (Member of Council)
CURWEN, H. B. .. .. .. Enfield House, Windmill Hill
(Member of Council)

D'Ambrumenil, B. .. .. .. 6, Gainsborough Gardens
Davis, R. R. .. .. .. 2, East Heath Road
Deacon, Rev. A. E., M.A. .. Christ Church Vicarage
Deedes, Rev. Brook, M.A. .. The Vicarage, Hampstead
Dickinson, F. L. A. .. .. 12, Ferncroft Avenue
Drummond, J. C. .. .. .. 12, Worsley Road
Drummond, Mrs. .. .. .. 12, Worsley Road
Drysdale, Mrs. .. .. .. Wick Hall, Radley, Berks
Dudman, J., Junr. .. .. .. 56, Rosslyn Hill
Dudman, G. Henderson .. .. 8, Upper Belsize Terrace
Dunbar, J. .. .. .. .. 6, Pilgrims Lane

Ebbetts, Mrs. .. .. .. 4, Wellington Place, N.W.
EDGEWORTH, PROFESSOR F. Y., M.A., D.C.L. (Vice-President) 5, Mount Vernon
Evans, Miss M. .. .. .. 11, Ferncroft Avenue

Fairclough, Alfred N. .. .. 6, Dartmouth Road, Brondesbu
Faraday, Harold .. .. .. 8, Oak Hill Park, Frognal
Fielder, Mrs. .. .. .. 6, Fellows Road
Figgis, Samuel .. .. .. Montague Grove, Frognal
Findon, Hugh, F.L.S. .. .. 58, Carleton Road, Tufnell Park,
Flatau, B. R. .. .. .. 6, Upper Hamilton Terrace, N.
Flight, W. C. .. .. .. Little Bines, Burwood, Sussex
Flook, Walter .. .. .. Heathlea, Willow Road
Forbes, Mrs. .. .. .. Egremont, 16, Willoughby Road
Forster, R. H. .. .. .. Artillery Mansions, Victoria St., S.W
Freuer, Miss .. .. .. .. 32, Willoughby Road
Frood, T. H. .. .. .. 3, Gayton Crescent
Frood, Miss D. .. .. .. 3, Gayton Crescent
Fulleylove, Christopher .. .. 21, Church Row

Gabb, Miss F. M. .. .. .. 11, Lismore Circus, N.W.
Gard, W. G. Snowdon, LL. B., F.G.S., 20, Upper Park Road
Garlick, Miss .. .. .. 11, Well Road
GARNETT, WILLIAM, M.A., D.C.L. (Member of Council) The Wabe, Redington Road
Gillies, Rev. James, M.A. .. .. 8, Thurlow Road
Gillman, A. R., F.Z.S., M.B.O.U. .. 5, Fellows Road
Godden, William .. .. .. 38, Burrard Road, W. Hampstead
Goodchild, Herbert, M.B.O.U. .. 66, Gloucester Road, Regent's Park
Gow, Rev. Henry, B.A. .. .. 3, John Street
Graham, H. Howgrave .. .. 12, Willow Road
Gray, Mrs. .. .. .. .. 3, Well Walk

Grenfell, J. S. Granville, M.A. .. Heath Mount School, Heath Street
Grundy, Edmund F. .. .. 14, Thurlow Road
Grundy, Mrs. E. F. .. .. .. 14, Thurlow Road

Hailston, Harold .. .. .. 91, Adelaide Road
Hallowes, S. M. .. .. .. Heath Fern Lodge, Heath Side
Hallowes, V. B. .. .. .. Heath Fern Lodge, Heath Side
HARBEN, SIR HENRY, J.P... .. Seaford Lodge, Fellows Road
(Vice-President)
Harcourt, R. F. Muller, M.A., F.K.C., 43, Heath Hurst Road
Hastie, Peter .. .. .. 24, Park Hill Road
HAYNS, JOHN, F.Inst.J. .. .. Campbell Cottage, 20, John Street
(Member of Council)
Hemingway, Walter .. .. 291, Finchley Road
Holmes, Miss Lucy .. .. 41, Haverstock Hill
Holtzapffel, Miss .. .. .. Terrace Lodge
Homfray, Mrs. G. .. .. .. 16, Church Row
Homfray, Miss .. .. .. 16, Church Row
Hopkins, A. E. .. .. .. 35, Antrim Mansions
Hopson, Montagu F., F.L.S., F.E.S. 30, Thurlow Road
Hopson, Mrs. .. .. .. 30, Thurlow Road
Hough, E. .. .. .. .. 8, Eldon Road
Howard, George .. .. .. St. Mary's, West Finchley
Hudson, Miss Constance .. .. 22, Kemplay Road
Hunt, E. J. .. .. .. 2, Frognal Mansions
Hunter, J. W. .. .. .. 41, Lancaster Road, S. Hampstead
Hutchinson, Rev. H. N., B.A., 94, Fellows Road
F.R.G.S., F.G.S.

James, Leonard, M.A. .. .. 8, Lyndhurst Road
James, Mrs. .. .. .. .. 8, Lyndhurst Road
Jealous, Mrs. .. .. .. 33, Pond Street
Jefferies, Mrs. M. .. .. .. 58, Parliament Hill
Jessop, Edward, M.R.C.S., L.R.C.P., 81, Fitzjohn's Avenue
Jevons, Miss .. .. .. 10, Hamilton House, Hall Road,
St. John's Wood
John, William, M.R.C.S., F.G.S. .. 24, Belsize Park Gardens
Johnston, Mrs. Charles .. .. 72, Fitzjohn's Avenue
Jones, A. Denman .. .. .. St. Aubyn's, The Vale
Jones, H. Sydney .. .. .. 39, Heath Hurst Road
Jones, E. Vaughan .. .. 9, Well Walk
Jones, V. Vaughan .. .. 9, Well Walk
Jones, Miss H. Vaughan .. .. 9, Well Walk
Joshua, Philip .. .. .. 45, Belsize Avenue

Kearne, S. R. .. .. .. 1, Lyndhurst Gardens
Kinder, Miss M. A. .. .. 44, Willow Road
King, Mrs. M. L. .. .. .. 18, Lyndhurst Road
Knight, G. McKenzie, F.R.A.S. .. 59, King Henry's Road
Knowles, C. Heygate, L.D.S.Eng... 13, Lyndhurst Road

Leftwich, Hugh S. .. .. .. 13, Chatsworth Road, Brondesbury
Le Grand, J. Prowett .. .. 5, Downside Crescent
Lintern, Miss Elsie .. .. 38, Rosslyn Hill
Lister, Miss .. .. .. .. Upper Heath
Lown, H. F. .. .. .. 31, Aberdare Gardens.
Lucey, H. C. .. .. .. 20, Christ Church Road

MacGregor, Miss H. D. .. .. 4, Prince Arthur Road
Maconochie, Harry .. .. Heath Brow Cottage
Maconochie, Mrs. .. .. .. Heath Brow Cottage
Malcolm, W. F. .. .. .. Birnan House, Fitzjohn's Avenue
Mallam, W. A., M.R.C.S., L.R.C.P., 63, Rosslyn Hill
March, Miss M. .. .. .. 74, Park Hill Road
Marks, K. I., F.R.M.S. .. .. 9, Randolph Gardens, N.W.
Martin, Miss F. .. .. .. 3, Foley Avenue
Melliss, H. J., B.A. .. .. 16, Hollycroft Avenue
Mellor, F. A. .. .. .. 62, Parliament Hill
Meredith, Mrs. .. .. .. 17, Buckingham Mansions, West End Lane
Messenger, H. W., L.D.S. .. 47, Rosslyn Hill
Millar, Henry E. .. .. .. Heathdown, East Heath Road
Milne, F. G. .. .. .. 75, South Hill Park
Money, C. J. .. .. .. Greenhill Flats, Perrins Court
Moore, Miss M. E. .. .. 5, Gayton Crescent
Moore, Mrs. Wm. .. .. .. 16, Denning Road
Muller, Hans .. .. .. 13, Thurlow Road
Mullins, E. G. .. .. .. Ivy Mount, Arkwright Road
Murdock, G. H. .. .. .. 31, Nassington Road
Murray, T. .. .. .. .. 57, Nassington Road
Myring, Jacob .. .. .. The Morellas, Eversfield Road, Richmond

Nash, Mrs. L. Fraser, L.R.C.P & S. Edin., L.F.P.S., Glas. 136, Haverstock Hill
Nevill, Miss .. .. .. 17, Belsize Crescent
Nicolson, Alexander M. .. .. Bankside, Christ Church Road
Norrie, C. M., B.Sc. .. .. 14, Maitland Park Villas

Organ, Miss Winifred C. .. .. 60, Dale Road, Gospel Oak
Orr, Miss M. S. .. .. .. 30, Heath Hurst Road

Pace, Harry .. .. .. 21, Constantine Road
Paine, F. E. .. .. .. Hillfield, Haverstock Hill
Paneti, E. T. .. .. .. 71, Adelaide Road
Park, Mrs. .. .. .. .. 19, Primrose Hill Road
Park, D. F., F.Z.S. .. .. 77a, Belsize Park Gardens
PAYNE, E. S. .. .. .. 45, Rosslyn Hill
(Member of Council)
Peabody, Miss Freda .. .. 23, Church Row
Pearce, Robert, M.P. .. .. Beechcroft, East Heath Road
Pearce, Mrs. .. .. .. Beechcroft, East Heath Road
Pearce, Miss .. .. .. Beechcroft, East Heath Road
Pearsall, H. D., M.Inst.C.E. .. 21, Parliament Hill
Pearse, D. Colbron .. .. 14, Willow Road
Pearse, Alfred .. .. .. 14, Willow Road
Pearse, Mrs. .. .. .. 14, Willow Road
Perrins, Ronald .. .. .. 1, Kemplay Road
PETRIE, Prof. W. M. FLINDERS, 8, Well Road
D.C.L., LL.D., Ph.D., F.R.S.
(Vice-President)
Petrie, Mrs. Flinders .. .. 8, Well Road
Pidcock, G. D., M.A., M.D., M.R.C.P. 74, Fitzjohn's Avenue
Player, J. H. .. .. .. 16, Prince Arthur Road
Plowman, H., F.S.A. .. .. 23, Steele's Road
PODMORE, FRANK, M.A. .. .. 6, Holly Place
(Vice-President)
Potter, G.W. .. .. .. Stowmarch, Elstree, Herts.
Prance, R. H. .. .. .. 29, Netherhall Gardens
Pridham, Miss .. .. .. 5, Squires Mount
Pugh, E. Staniland .. .. 31, Belsize Road
Purry, Walter .. .. .. 44, Well Walk
Purry, Mrs. .. .. .. 44, Well Walk

Quekett, O. C. .. .. .. 70, Greencroft Gardens

Radford, Maitland .. .. .. 1, Portland Villas, East Heath Road
Raisin, H. W. .. .. ..
Raisin, Mrs. .. .. .. } Hawk's Nest, Stanhope Avenue,
Raisin, W. F. .. .. .. Church End, Finchley
Randall, T. Gurney .. .. 40, Englands Lane
Rayner, Henry, M.D. .. .. Upper Terrace House

Rickett, W. R., J.P. .. .. Sunnyfield, West Heath
Ridley, Miss J. .. .. .. 31, Daleham Gardens
Robins, P. S. .. .. .. 20, Greencroft Gardens
Roddick, J. R. .. .. .. 103, South Hill Park
Rowney, W. G. .. .. .. Noel House, Gainsborough Garde
RUDLER, F. W., I.S.O., F.G.S. .. 18, St. George's Rd., Kilburn, N.W
(Member of Council)
Russell, Chas. A., K.C. .. .. 53, Netherhall Gardens
Russell, Mrs. .. .. .. 53, Netherhall Gardens
Rutland, J. H. .. .. .. 81, South Hill Park

Sanders, C. G. .. .. .. 13, Platt's Lane.
Sanders, Mrs. .. .. .. 13, Platt's Lane
Savage, Mrs. .. .. .. 14, Gardnor Mansions, Church Ro
Savage, Miss M. G. .. .. 14, Gardnor Mansions, Church Ro
SCHRÖDER, WALTER .. .. Telegraph Hill, West Heath
(Member of Council)
Scott, Victor .. .. .. Bank House, Willesden Green
Scull, Miss E. M. L. .. .. St. Edmund's, Worsley Road
Shackleton, Miss M. H. .. .. 20, Belsize Crescent
Sharman, Henry, M.D. .. .. Sedgemoor, Arkwright Road
SHENTON, E. W. H., M.R.C.S., 7, Heath Mansions, The Grove
L.R.C.P. (Member of Council)
Shenton, Mrs. E. W. H. .. .. 7, Heath Mansions, The Grove
Sibson, A. E. .. .. .. 19, Carlingford Road
Sievers, C. .. .. .. .. 8, Kingdon Road, West End Lan
Simmons, Chas., M.A. .. .. Holly Hill
Sloper, G. Randall .. .. 24, Lymington Road
Small, C. P. .. .. .. 28, Church Row
Smart, H. A. .. .. .. 40, Compayne Gardens
SMART, H. NEVIL (Photographic 40, Compayne Gardens
Secretary)
Steinberg, Miss Alice .. .. 54, Fellows Road
Steinberg, Miss C. F. .. .. 54, Fellows Road
Stevenson, Miss .. .. .. 2, Prince Arthur Road
STOKES, A. W., F.C.S., F.I.C. .. 60, Park Hill Road
(Member of Council)
Stokes, Mrs. .. .. .. 60, Park Hill Road
Stopes, Miss Marie C., D.Sc., Ph.D. 53, Stanley Gardens
Strange, R. Gordon, M.S., M.B. .. 2, Belsize Avenue
Strange, Miss .. .. .. 2, Belsize Avenue

Taylor, C. J. G. .. .. .. 26, Primrose Hill Road
Taylor, C. L. .. .. .. 26, Primrose Hill Road

Or ylor, E. Claude, M.D., F.R.C.S., Eland House, Rosslyn Hill
Or M.S.
BB, A. E., M.D., B.S., D.P.H. .. 226, Finchley Road
Pa (Member of Council)
Pabb, Mrs. A. E. .. .. .. 226, Finchley Road
Paschemacher, Mrs. .. .. .. 11, Redington Road
Pompson, A. Hugh, M.A. M.D. .. 26, Ellerdale Road
Pompson, Mrs. .. .. .. 26, Ellerdale Road
POMPSON, Prof. SILVANUS, P., D.Sc., F.R.S. (Vice-President) Morland, Chislett Road, West Hampstead
Thorn, Miss E. S., B.A. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss M. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss R. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
whrower, Alfred .. .. .. 1, Chalcot Gardens
wiver, Ernest .. .. .. 15, Greenhill Flats, Perrins Court
Trefzger, H. .. .. .. 24, St. Mary Axe, E.C.
Turner, G. H. .. .. .. 35, Rosslyn Hill

Underdown, Herbert W. .. .. 22, Belsize Crescent
Underdown, Miss E. .. .. 22, Belsize Crescent

Viner, Miss F. A. .. .. .. 15, Thurlow Road
VIZARD, P. E., F.R.A.S. (Vice-President and Astronomical Secretary) .. Belsize Lodge, Belsize Lane
Vizard, W. G. .. .. .. 22, Downshire Hill

Wade, L. A. .. .. .. 99, Broadhurst Gardens
Waghorn, John .. .. .. 11, Arkwright Road
Waghorn, Mrs. J. .. .. 11, Arkwright Road
Waghorn, Miss .. .. .. 11, Arkwright Road
Wainwright, Shirley .. .. Elm Lodge, Elm Row
Wallis, Ernest .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. Ernest .. .. Lested Lodge, Well Walk
Wallis, Mrs. Isabel White .. .. Upper Frognal Lodge
Watkins, C. A. .. .. .. 77, Fitzjohns Avenue
Watt, H. B., M.B.O.U. .. .. 3, Willow Mansions, Fortune Green Road
Watts, P. A. .. .. .. 49, Goldhurst Terrace
Weber, F.O. .. .. .. 44, Stanley Gardens
Wells, Josiah .. .. .. 1, Arkwright Road
White, C. T. .. .. .. 17, Parolles Road, Upper Holloway
White, Miss Ellen .. .. .. 2, Rosslyn Mansions, Goldhurst Terrace
Whiting, James E. .. .. 41, Heath Street

Wilder, John F. .. .. .. 30, Baronsmere Road, E. Finchley.
Wilkins, Henry .. .. .. 17, The Pryors, East Heath Road
Wilkins, Miss .. .. .. 1, Ellerdale Road
WILKS, Sir SAMUEL, Bart., M.D., 8, Prince Arthur Road
LL.D., F.R.S. (President)
Wilks, William .. .. .. 19, Denning Road
Wilks, Mrs. .. .. .. .. 19, Denning Road
WILLIAMS, J. W., M.R.C.S., 128, Mansfield Road
L.R.C.P., F.L.S., F.R.M.S.
(Natural History Secretary)
Williams, Mme. Lottie .. .. 38, Rosslyn Hill
Williams, Philip H., A.C.A. .. 27, Mincing Lane, E.C.
Willis, Herbert J. .. .. .. 26, Kemplay Road
Withers, J. E. .. .. .. 49, Maresfield Gardens
WOMACK, FREDK., M.B., B.Sc. .. 115, Alexandra Road
(Member of Council)
Woolf, M. Yeatman, F.E.S. .. 46, St. John's Wood Park
Woolf, Mrs. .. .. .. 46, St. John's Wood Park
Wylie, R. W., M.A... .. .. 32, Willoughby Road

YEARSLEY, P. MACLEOD, F.R.C.S., 10, Upper Wimpole Street, W.
F.Z.S. (Member of Council)
Yeld, Miss M. .. .. .. 29, Platts Lane

# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY.




1906.

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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With a List of the Members.

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*For the Year* 1906.

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PRICE THREEPENCE.

Published by the Society,
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GROVE WORKS
AYLESBURY


BRITISH MUSEUM
NATURAL HISTORY

THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

By the generous gift of Colonel Heberden, the Society is the possessor of a reflecting telescope of 10½ inch mirror, which is erected in a small observatory on the East Heath by permission of the London County Council. Particulars as to the use of the Telescope can be obtained of the Hon. Astronomical Secretary.

A General Meeting of the Society is held at the Town Hall (Small Hall), on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 p.m. precisely. Meetings of the various Sections are also held regularly at the Hampstead Library.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, of having free access to the Telescope, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretary, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned,**

C. O. BARTRUM,
R. W. WYLIE, } *Hon. Secretaries of the Society,*

12, Heath Mansions, Heath Street,
Hampstead, N.W.

*February*, 1907.

# Hampstead Scientific Society.

***List of Officers for the Year 1907,***

Elected at the Annual Meeting, February 1st, 1907.

**President.**

SIR SAMUEL WILKS, Bart., M.D., LL.D., F.R.S.

**Vice-Presidents.**

WALTER BAILY, M.A., F.Z.S.*
SIR GEORGE BARHAM, J.P.
Mrs. SOPHIE BRYANT, D.Sc.
Prof. F. Y. EDGEWORTH, M.A., D.C.L.
Sir HENRY HARBEN, J.P.
Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.
FRANK PODMORE, M.A.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*.)

C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS.
E. S. PAYNE.*
F. W. RUDLER, I.S.O., F.G.S.
WALTER SCHRÖDER.
E. W. H. SHENTON, M.R.C.S., L.R.C.P.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.
F. WOMACK, M.B., B.Sc.
P. MACLEOD YEARSLEY, F.R.C.S., F.Z.S.
J. W. WILLIAMS, M.R.C.S., F.L.S.

**Hon. Secretaries.***

C. O. BARTRUM, B.Sc.
12, Heath Mansions,
Heath Street,
Hampstead, N.W.

R. W. WYLIE, M.A.
44, Avenue Road,
Highgate, N.

**Hon. Treasurer.***

C. COMPSON CRUMP,
L. & S.W. Bank, Ltd., High Street, Hampstead.

---

**ASTRONOMICAL SECTION:**

**Hon. Secretary.***

P. E. VIZARD, F.R.A.S.
Belsize Lodge, Belsize Lane,
Hampstead.

**PHOTOGRAPHIC SECTION:**

**Hon. Secretary.***

H. NEVIL SMART.
40, Compayne Gardens,
West Hampstead.

**NATURAL HISTORY SECTION:**

**Hon. Secretary.***

HUGH FINDON, F.L.S.
58, Carleton Road, Tufnell Park, N.

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* *Executive Committee.*

# Report of the Council,

FOR THE YEAR 1906.

*Read at the Annual Meeting, February 1st, 1907.*

THE Council has to report that the work of the Society has continued in a uniformly satisfactory manner during the past year. Thirty-nine new members have been elected during the year, the membership now standing at 309.

The Council regrets that Mr. Edward Bond, who was President of the Society at its inauguration in 1899, and during the year 1900, has been obliged to resign his connection with the Society, as he has left Hampstead. Sir George Barham, J.P., has been elected a Vice-President.

Dr. J. W. Williams, who has been Honorary Secretary of the Natural History Section since its formation in 1900, and to whose energy and ability is chiefly due the success which has attended the work of the Section, resigned his position in May last, owing to the pressure of work. He is willing to retain his seat on the Council, and to give the Society—and especially the Natural History Section—the benefit of his active sympathy and help. Mr. Hugh Findon, F.L.S., has been appointed by the Council to the Secretaryship pending the Annual Meeting, in accordance with the power given it by Rule 4. The Council recommends that this appointment be confirmed at the Annual Meeting.

In the early summer the Honorary Secretary of the Society expressed to the Council his need of some assistance during the following few months, in consequence of his impending marriage. Mr. R. W. Wylie was, therefore, asked to act as joint-secretary with Mr. C. O. Bartrum. This he kindly consented to do. The thanks of the Society are due to him for the assistance thus rendered.

The accounts of the Society for the year 1906 have been audited. A statement of receipts and expenditure will be found on page 8 & 9. It will be seen by this statement that there is a deficit on the year's work of £2 8s. 3d., making, with the deficit outstanding at the end of 1905, £12 1s. 10d. This will be more than covered when the subscriptions for 1906 still unpaid have come in. It is satisfactory to be able to report that the deficit that the accounts have shown since 1902 has now been practically wiped out.

Twenty-eight meetings have been held during the year, including three vacation meetings. There were given, in addition, three Christmas Juvenile Lectures, and a course of three lectures on Nature Study. The proceedings at the General and Sectional Meetings will be found on pages 10 and 23. The Natural History and Photographic Sections have been very active during the past year, and their meetings have been unusually well attended. Particulars of the vacation meetings will be found on page 23.

The course of Christmas lectures to children (see page 24) was fairly well attended. Three lectures on Nature Study (see page 23) were given by Mr. Wilfred Mark Webb in the early months of the year. The lectures contained much that was of

value to those teaching this subject among children. It was unfortunate that a larger number did not avail themselves of the opportunity afforded them.

At the invitation of the Corresponding Societies' Committee of the British Association for the Advancement of Science, the Hampstead Scientific Society applied for enrolment as an "Associated Society." The application was favourably received by the Committee, and the Society was duly added to the List. The Annnual Conference of the Delegates from the Corresponding Societies was held at York during the Meeting of the British Association (August 1–8). Mr. F. W. Rudler, Secretary of the Corresponding Societies' Committee, kindly undertook to represent the Society as delegate at the Conference. His report on the Conference will be found on page 26. It is hoped that the two suggestions put forward, *viz.*, that local societies should assist in systematic meteorological observation and in local photographic survey work, will be acted upon by the Society.

The Annual Congress of the South-Eastern Union of Scientific Societies was held at Eastbourne in June. Mr. Hugh Findon attended as delegate of the Society. His report will be found on page 27. This Annual Congress gives workers in Natural History a valuable opportunity of coming into closer touch with one another, and of benefitting in other ways from an interesting meeting. The Hampstead Scientific Society being affiliated to the Union, its members are entitled to attend the Congress.

# STATEMENT OF ACCOUNTS.

*For the Year ending 31st December, 1906.*

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1906 Subscriptions paid in 1905, brought forward ... ... ... ... 8 19 0 | | | |
| 1906 Subscriptions... ... ... ... 69 18 6 | | | |
| | 78 | 17 | 6 |
| Conversazione Tickets ... ... ... ... | 3 | 7 | 6 |
| Juvenile Lectures ,, ... ... ... ... | 2 | 19 | 0 |
| Nature Study ,, ... ... ... ... | 2 | 15 | 1 |
| Ordinary Receipts during 1906 ... ... ... | 87 | 19 | 1 |
| Donations— | | | |
| A Friend of Sir Samuel Wilks ... 2 2 0 | | | |
| E. C. C. ... ... ... ... ... 1 1 0 | | | |
| | 3 | 3 | 0 |
| | 91 | 2 | 1 |
| **Present Deficit *** ... ... ... ... ... | 12 | 1 | 10 |
| | £103 | 3 | 11 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... | 15 | 8 | 5 |
| Printing and Delivering Report ... ... | 8 | 6 | 3 |
| Rent Town Hall ... ... ... ... ... | 11 | 0 | 6 |
| Rent Stanfield House ... ... ... ... | 7 | 15 | 0 |
| Advertisements—Bill Printing and Posting ... | 11 | 8 | 0 |
| Photographic Section ... ... ... ... | 4 | 16 | 10 |
| Natural History Section... ... ... ... | 1 | 10 | 0 |
| Conversazione ... ... ... ... ... | 7 | 10 | 0 |
| Field Meetings ... ... ... ... ... | 0 | 13 | 6 |
| Subscription to Royal Photographic Society... | 1 | 1 | 0 |
| S.E. Union of Scientific Societies ... ... | 0 | 7 | 6 |
| S.E. Union Meeting ... ... ... ... | 0 | 13 | 5 |
| Lecturers Expenses ... ... ... ... | 5 | 18 | 0 |
| Cheque Book ... ... ... ... ... | 0 | 8 | 4 |
| Postages ... ... ... ... ... ... | 8 | 4 | 6 |
| Clerical Assistance ... ... ... ... | 3 | 3 | 0 |
| Lantern and Gas ... ... ... ... ... | 1 | 5 | 2 |
| Sundry Expenses, per Hon. Secretary ... | 4 | 0 | 11 |
| Expenditure during 1906 ... ... ... | 93 | 10 | 4 |
| Deficit brought forward, 1/1/06 ... ... | 9 | 13 | 7 |
| | £103 | 3 | 11 |

Subscriptions in hand for 1907 paid in 1906, £10 12s. 6d.

E. COMPSON CRUMP, *Hon. Treasurer.*
26th January, 1907.

*Audited and found correct,* { E. S. PAYNE, WALTER SCHRÖDER.

* The outstanding Subscriptions, about 60, not paid in 1906, should more than cover the deficit of £12 1s. 10d.

# EPITOME OF EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Natural History Section ... ... ... ... ... ... ... | 3 | 8 | 0 |
| Photographic Section ... ... ... ... ... ... ... | 11 | 6 | 7 |
| Nature Study Lectures ... ... ... ... ... ... ... | 6 | 2 | 9 |
| Juvenile Lectures ... ... ... ... ... ... ... ... | 3 | 4 | 1 |
| Conversazione ... ... ... ... ... ... ... ... | 16 | 12 | 7 |
| Report ... ... ... ... ... ... ... ... ... | 8 | 16 | 1 |
| General Expenses ... ... ... ... .. .. ... ... | 40 | 5 | 10 |
| Royal Photographic Society ... ... ... ... ... ... | 1 | 1 | 0 |
| S.E. Union Subscription ... ... ... ... ... ... ... | 0 | 7 | 6 |
| S.E. Union Meeting at Eastbourne ... ... ... ... ... | 0 | 13 | 5 |
| Field Meetings ... ... ... ... ... ... ... ... | 1 | 12 | 6 |
| | £93 | 10 | 4 |

# Abstract of Proceedings.

1906.

## General Meetings.

Friday, January 5th. Sir Samuel Wilks, Bart., M.D., F.R.S., President, in the Chair.

**Mr. Walter Baily, M.A.,** gave a lecture entitled "**Patterns in Space,**" illustrated with models. In the simplest kind of pattern, he said, such as occurs in ribbons, borders, or friezes, there is a direction such that, if a point is taken and a certain distance measured in that direction, the same state of things is found at each end of this distance. A line, straight or crooked, can be drawn across the pattern, and similar lines at the proper distance from one another. These lines will divide the pattern into enclosures, exactly like one another, and the design in all the enclosures will be exactly the same. Passing on to patterns in which the recurrence of the same state of things occurs in more than one direction, so as to cover a surface of any extent (of which the patterns of wall-papers are a familiar example), we have to inquire how to divide a flat surface into enclosures, all exactly alike, and in similar positions; and, this being done, it only remains to draw some design in one of the enclosures, and to repeat it in all the others, for a pattern to be formed. The simplest enclosures are the square and the hexagon. These may be altered by lengthening any pair of opposite edges, and again by sloping the sides, maintaining opposite sides always equal and parallel. Any amount of complication may be introduced by cutting out a piece from one side of the figure and sticking it on to the corresponding part of the opposite side, and repeating the same process with the other pairs of opposite sides. A designer of wall-papers might first prepare a very complicated form of enclosure, and then invent a design to fill it. He would find much more scope for his imagination than if he worked from a simple oblong. The same method may be applied to find enclosures of space of three dimensions. The simplest form is the cube. This may be altered as before, by lengthening and sloping into variously-shaped bricks, which may

be built up to fill space. By shifting them relatively to one another, we may arrange them so that each brick touches fourteen other bricks. The most generalised figure which will fill space is one with fourteen plane faces and thirty six edges. Eight of these faces are hexagoned and six quadrilateral. Here again, by lengthening lines which are parallel to one another and by sloping the figure, other forms may be obtained which have the property of filling space. From this generalised figure all the other figures that fill space may be obtained by shortening one or more groups of parallel edges until they disappear. Thus we get the form with twelve faces, with four sides to each face. The cell of the hive-bee is half of such a form as this. All these properties were demonstrated by means of cardboard models, and the method of cutting the fourteen-faced form out of a solid block was demonstrated by slicing a Dutch cheese into the required shape. The properties of crystals show that their internal structure must consist of a pattern arrangement of the molecules, and so be related in some way to these simple space-filling forms. The form which has twelve four-edged faces is that involved in the piling of spheres in the way in which apples or oranges are piled in greengrocers' shops, while the six-sided prism and the cube are related to other forms of piling. The external forms of crystals are, however, rarely such that they can be packed together without having any interstices.

On Friday, February 3rd, the Annual General Meeting was held, under the presidency of Sir Samuel Wilks, Bart., F.R.S., the President. The Report of the Council was read and adopted. The President, Officers and Council were elected.

The meeting was resolved into an ordinary meeting.

**Dr. Edward Shinton, M.R.C.S., L.R.C.P.,** gave a demonstration of the **"Uses of X-Rays in Medicine."**

Friday, March 2nd. Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

**Mr. J. H. Leonard, B.Sc.,** gave a lecture on **"The Natural History of Slate,"** with lantern illustrations. The lecturer opened his remarks with a short review of the conditions of deposition of sedimentary rocks and the meaning of the sequence in which they occur. Some of the agencies tending to alter sedimentary strata were then explained, the lantern slides shown in connection with this part of the subject bringing out the importance of field

work in geology and the interesting manner in which the study of thin sections of rocks under the microscope assisted and checked the conclusions of geologists. This led naturally to the detailed examination of the phenomena of cleavage; the characters of cleaved rocks, their modes of occurrence, and their distribution being all passed under review. It was seen that cleavage planes differed very greatly from bedding planes, the former having no necessary connection with the latter, though both contributed to the fissility of a rock. The experimental formation of cleavage was next described, reference being specially made to the work of Tyndell and Danbrée on this subject. The conclusion was thus reached that slates were rocks in which the cleavage was a characteristic which had been induced by great pressure consequent on earth movements; and evidence was adduced of the gigantic forces which had been at work, as shown by the flattened pebbles, distorted fossils, and mineral rearrangement of the rocks involved. A general account of the distribution of slates followed, and a special description was given of the slates of North Wales and the Lake District. Lantern slides were exhibited of views in these localities, and it was pointed out how the hardness or softness of the cleaved beds modified the scenery of the neighbourhood, notably in the Borrowdale and Skiddaw districts. The lecturer concluded with some account of the Llanberis and Penrhyn quarries, several interesting particulars being given about them, both with respect to the actual occurrence of the slates themselves, and also with regard to their history, some of those at Llanberis, *e.g.*, being beds of volcanic ash which subsequently became consolidated and underwent cleavage at a still later date.

Friday, April 6th. Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

In the absence, owing to illness, of **Mr. C. Louis Taylor,** Assistant Editor of the *British Medical Journal*, his lecture on "**Epochs in Medical History**" was read by the President. The science and art of medicine could not be said to have been progressive in its early history, since for many centuries it stood still, possessing only one master and authority, Galen. It was not until about 300 years ago that we had any real knowledge of anatomy, about the same time when Harvey made his discovery of the circulation of the blood. After this our knowledge of disease gradually improved; but it was not until about the accession of Queen Victoria that any rapid progress was made, and then the advancement went on by leaps, as new discoveries were being

constantly made ; so that it may be safely said that the last sixty years has seen a greater advance in medicine than in the whole history of the world before. The writer of the essay showed how in early times diseases were attributed to evil spirits having taken possession of the body, and that it was attempted to expel these by beating the patient, starving him, or smoking him with evil-smelling substances. A remnant of the superstition apparently still exists, when we see poor people believe in the efficacy of medicine in proportion to its nastiness. The long belief in the demoniacal theory of disease was followed by that of witchcraft, when poor old women, guilty of nothing but ugliness, eccentricity, or perhaps madness, were burned as witches. This continued up to the time when, little more than two hundred years ago, two harmless women were burned at Norwich. In very remote times, however, there seems to have been considerable skill in surgery, for we find fractured bones which have been well set, and skulls with repaired holes in them which were due to what is now called trephining, and which could only have been performed by flint instruments. The meaning of these holes found in skulls of the neolithic period has been much discussed. The lecturer then referred to faith healing, which had existed for ages in the form of priest-craft. When the people flocked to the temple of some great god in ancient times, to be cured of their maladies, they were met by the priest, who administered some magic spell derived from the hidden god within. Even in the great shrines devoted to Esculapius his disciples joined spiritual ministrations with their cures, for it was only through them that the great god could exercise his power of healing. The method was the same, whether at the great sanatorium of Epidaurus, or at the famous shrines of India, or Mecca, or Lourdes, or St. Winifred's Well, and whether it is exercised by medical men, marabouts, canonised saints, or Christian Scientists. It is the faith that makes them whole. The shrine or the amulet, the priest or the doctor, are but the instruments that set in motion a force which quickens the nerve that has ceased to convey the behests of the will into new life. The lecturer then gave some account of what was known in very ancient times relating to anatomy and disease. The first mention of a physician in Egypt was 3500 B.C.; he was afterwards worshipped in statues as a god. Tablets and papyri showed that he had a good acquaintance with many known diseases, and his list of medicines was very long. Hippocrates, the father of Greek medicine, had a great Esculapian Temple in the island of Cos. It is but quite lately that this temple has been discovered, and in one of the rooms is inscribed his well-known aphorism, " Life is short, but art is

long." It was only of late years that the renascence came. The great discovery of vaccination to withstand the frightful scourge of small-pox, which carried off more than half-a-million of people annually, led to a further discovery of a general law, *viz.*, that immunity against the diseases caused by a specific poison can be produced by inoculation of that poison in an attenuated state. Then, in later years, we have had the great discovery of anæsthetics, which throw the patient into a deep sleep and render him unconscious of pain. Finally, the greatest improvement in surgery which the world has ever seen is the work of Joseph Lister. Following the footsteps of Pasteur, he discovered the cause of the blood poisoning which made every operation so hazardous, and so, by attacking the microbes, he has saved more lives than were destroyed in the wars of Napoleon. The lecture was not unmindful of preventive medicine and what it had done, and stated that England took the foremost place in all subjects of hygiene.

Friday, May 4th. Sir Samuel Wilks, Bart. F.R.S., President, in the Chair.

**Dr. F. Womack, M.B., B.Sc.,** gave a lecture on **"The Tone Qualities of Musical Instruments,"** illustrated with experiments and lantern slides. The lecturer said that ordinary musical sounds are not simple, but consist of a series of superposed vibrations, each one of which is simple and connot be further decomposed. The principal vibration is called the " fundamental " and gives the pitch of the note. The other vibrations have frequencies, two, three, or more times that of the fundamental, and upon their relative intensity depends the quality of the sound as distinguished from pitch. The lecturer showed, by means of an experiment with a sonometer and a 'cello, that these higher vibrations, or partials, are actually sounding when the string is bowed. The sound of a tuning-fork is a simple vibration and has no harmonics or partials, and consequently no " character." Different instruments owe their differences of quality to different groupings of the upper partials, as the lecturer showed by a table. With organ flute pipes the upper partials are somewhat lacking, thus giving the mellow diapason quality. To give more character therefore stops, having a series of pipes sounding with each note, are added to organs. They are called mixtures. They add character to a combination of stops by supplying the lacking harmonics. Reed pipes—the oboe, clarinet, bassoon, and the reed pipes of an organ—have certain harmonics strongly enforced, which give their special " nasal " quality. The lecturer illustrated

these principles with many striking experiments and lantern slides. Then he explained that the tremulous sound of the organ "vox humana" is produced by using two pipes for each note, one of which is slightly out of tune, thus causing beats. Different theories that have been held as to the production of the human voice, and of the different qualities to which the vowel sounds are due, were also touched upon.

On Tuesday, October 30th, the General Meeting took the form of a Conversazione, to inaugurate the Session 1906–7.

The proceedings began by the presentation of a wedding present, subscribed for by the members, to Mr. C. O. Bartrum, the Hon. Secretary. It consisted of a pair of binocular field-glasses and a number of volumes of valuable standard works.

**Lieutenant E. H. Shackleton,** late of the *Discovery*, gave an address entitled "**Furthest South,**" illustrated with lantern slides. The lecturer began by giving details as to the building, equipment and cost of the ship *Discovery* and of the expedition. The Government supplied a great part of the necessary funds in order that investigations of the meteorological and magnetic conditions might be made, and other scientific observations taken. The lecturer described the voyage from New Zealand, and showed photographs of the scenes met with and of the winter quarters of the expedition. He told of the method of obtaining fresh seal meat and of the life on board, including the forms of recreation during the long winter. The conditions under which magnetic observations were made were shown by several photographs, and the lecturer stated that during the whole of the time the *Discovery* was in the Southern regions they never once failed to make an observation every two hours. The lowest temperature recorded was sixty-eight degrees below zero, about a hundred degrees of frost. Mr. Shackleton then went on to picture and describe the historic sledge journey which resulted in Capt. Scott, Dr. Wilson, and himself reaching the furthest point South yet touched by man. They started out on November 2nd, 1902, with nineteen dogs, sledges, provisions for eighty-four days, and other necessary equipment, and he thought that if they had taken more dogs they would have got still further South. The dogs died off, and finally they had to drag their own sledges. Half of the baggage had to be taken forward, and the other half returned for, and, under these circumstances, it was impossible to advance more than five miles daily, which meant that they had to cover fifteen miles a day.

On December 30th, 1902, they reached the most Southerly point. They were then compelled to return, as they were suffering from scurvy and running short of provisions. Mr. Shackleton spoke of the sufferings endured by the party, and especially of himself, when he had the misfortune to rupture a blood vessel on the journey. On the journey they discovered a great range of mountains, considered to be the most Southerly land. They reached the *Discovery* after an absence of ninety-four days, during which time they had covered a distance of 973 miles. During those ninety-four days they never took off their clothes and never had a wash. After the pictures had all been shown, Lieut. Shackleton displayed some of the clothing and equipment worn or used by himself on the journey, and concluded with a few observations upon the expedition as a work undertaken for the good of science and humanity generally, and not for the sake of gain.

After the lecture, refreshments were served in the Large Hall.

Lantern photographs were shown in the Small Hall by Mr. A. C. Jewitt, and Natural History and Photographic exhibits were on view.

Friday, December 7th. Sir Samuel Wilks, Bart., F.R.S., President, in the Chair.

**Dr. Hugh Robert Mill** gave a lecture on "**Weather and Weather Observing,**" with lantern illustrations. The lecturer said that observing the weather was an art which was very easily acquired. It required a certain amount of practice, as all arts did, but there was no mystery about it. There were three things necessary for proper observations of the weather. The first was a good set of instruments; the second was intelligence, which was fairly necessary, though not so necessary as a good set of instruments; and the third was a sensitive conscience. With regard to the last-mentioned necessity, he said that for weather observing he would rather have an honest dull-witted person than a clever but unconscientious man who tried to get results according to his own doctrines. He was very glad indeed to hear that this society had under consideration the subject of the foundation of a Meteorological Observatory on Hampstead Heath, and he suggested and described the necessary instruments, such as barometers, thermometers, sunshine recorders, anemometers, rain-gauges, etc. The lecturer then proceeded to show some lantern slides from photographs and diagrams prepared by himself, commencing with a photograph of the oldest known building devoted exclusively to the study of meteorology, the Tower of the Winds at Athens. As

a contrast he showed a picture of a modern observatory, that at Greenwich. He then offered some remarks upon the subject of winds, and especially with regard to cyclones, the directions of which he explained by means of diagrams prepared from charts of the tracks of ships. With regard to air pressure he explained what an enormous amount of information could be gained from a systematic study of barometers in all parts of the country at the same time. A great many more barometers were needed, and also sunshine recorders, and more confidence in their readings. There had been cases in which the readings of sunshine recorders at health resorts had shown the number of hours of sunshine in one day as an hour longer than the sun could be above the horizon. On the question of temperature the lecturer offered some remarks in regard to experiments conducted in the upper air by means of box kites fitted with various instruments. Coming to the subject of the measurement of rain, he described a rain gauge, and spoke of the importance of placing such an instrument in the right position, on account of the eddies due to houses, hills, or trees, giving some humorous stories of the curious results obtained in cases where such difficulties were overlooked. He then displayed a number of diagrams showing the rainfall in recent years, and suggested that the results showed that the heaviest rainfall was always on the left-hand side of the track of a cyclone. A popular belief was that we always had two dry years and then a wet one, and since 1889 that had proved to be so; but if they went further back than those years they found that no such rule obtained.

The Society is indebted to the Editor of the *Hampstead and Highgate Express* for assistance in reporting the above meetings.

## Natural History Section.

The number of members of this Section and the attendance at the meetings are still up to the standard of former years, the average attendance being thirty-two, or about one half of our members. Of the seven meetings this past year, five have been addressed by our members whose names and work are known and appreciated. Still, it would have been desirable to have heard some members whose names are not so familiar, and whose modesty, or perhaps inertia, seems to hold them eternally in the background.

In order that this Society should hold the place it has attained among Natural History Societies, by the hard and conscientious work of some dozen of our members, it is absolutely necessary that the bulk of us should be real Nature observers, and not simply an interested audience. This is not asking a hard thing. We have seen, time after time, how a little investigation into the most common objects of Nature repays the naturalist a thousand-fold for his trouble, and in a way which recuperates both mind and body wearied by earning his daily bread.

But to place this matter on higher ground, what progress has the ordinary man made in understanding Nature since the days of Pliny? Read the motto on the cover. It is clearly the duty of each member of our section to do something, to study some branch or aspect of Nature. There are many dark corners which want lighting up, very big corners some of them. Let them bring the result, however trivial it may seem, before their fellow members. Your secretary should be, and desires to be, overwhelmed with exhibits and applications to read papers instead of wondering what to produce at the next meeting. Most of us have lived half of our allotted span of life. What if at the end we be asked, "What do you think of the wondrous world you live in?" Shall we have to answer, "I have not thought it worth while to look at it"?

Meetings were held at Stanfield House during 1906 as follows :—

Friday, January 12th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There was a small attendance owing to the inclement evening.

**Sir Samuel Wilks** read a paper (with exhibits) on **"The Cases of Death by Lightning on Hampstead Heath"** on July 9th of the preceding year; the victims being a young man and his little girl. The thunderstorm came on suddenly, when they fled for shelter under the hedge of a keeper's watch-box, and immediately afterwards a flash of lightning struck the roof, and passing down, instantly killed both of them. The right sleeves of the man's coat and shirt were torn from top to bottom, and the skin beneath burnt. The child's frock and underclothing were torn in the same direction, and the right boot torn to pieces, the foot being injured. The rents in the dresses showed, by the threads remaining, that the force producing them was acting from within exactly as if done by an explosive material. The wooden pinnacle of the watch-box was burst asunder from the centre.

The same effect is witnessed in the case of the so-called fire-ball, which sows destruction wherever it strikes; the cause in both cases probably being the same, an explosion of a circumscribed and confined mass of electricity.

Friday, February 9th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There was a large number of persons present.

**Mr. Montague F. Hopson, F.L.S., F.E.S.,** read a paper on **"British Hawk Moths."** The name given to this group of moths is *Sphingides*. The order *Lepidoptera* is divided into two divisions—(1) *Rhopalocera*, or those with clubbed antennæ, comprising butterflies, and (2) *Heterocera*, or those whose antennæ are otherwise. These are the moths among which are the *Sphingides*.

British Hawk Moths number only seventeen species, and five of these are exceedingly rare. A superficial glance is sufficient to show their large size and brilliant colouring. The expanse of the wings measures from two to six inches. Twelve months usually suffices to complete the cycle of change. The eggs are pale green, large and ovoid, and are laid in summer on the food plant. The larvæ of most of the *Sphingides* are beautiful objects and of large size. They have six true legs and ten creepers. All seek the ground in which to pupate, some burrowing deeply. The pupæ are roughly conical, with a hornlike projection at the smaller end. Their colour is commonly brown, ruby or black. The popular distinctive names of our British species are :—the Broad-bordered Bee Hawk, Narrow-bordered Bee Hawk, Humming Bird Hawk, Elephant Hawk, Silver-striped Hawk, Small Elephant Hawk, Striped Hawk, Oleander Hawk, Convolvulus Hawk, Privet Hawk, Pine Hawk, Death's Head Hawk, Lime Hawk, Poplar Hawk, and Eyed Hawk Moths. Mr. Hopson gave a detailed description of each species and its habits. His paper was illustrated throughout by many specimens representing most of the above-named species.

Friday, March 9th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There was a good attendance.

**Mr. P. Macleod Yearsley, F.R.C.S., F.Z.S.,** read a paper on **"Echinoderms,"** with lantern illustrations. He said "Echinoderm" meant prickly skin, for most echinoderms had spines or nodules. They were divided into five classes :—(1) *Asteroidea*—the starfishes, (2) *Ophiuroidea*—the brittle stars, (3) *Echinoidea*—

the sea-urchins, (4) *Holothuroidea*—the sea-cucumbers, (5) *Crinoidea* —the sea-lillies and feather-stars. The common starfish was taken as a type, and its structure minutely described. It consists of a central disc and a number of arms or radii. The upper surface is studded with irregular nodules; here also is the vent and a little porous plate, the madreporite. In the centre of the under surface is the mouth; along each ray is an "ambulacral groove," from which spring the "tube-feet," by which the animal walks. These can be inflated at will by means of the complicated "water vascular system" connected with the madreporite. Above the mouth is a baggy stomach. The starfish, when feeding, protrudes its stomach through its mouth, enfolds with it its prey which it digests, and then withdraws it. Starfishes have generally—but not always—five arms.

The Brittle-stars differ from the starfishes in having no ambulacral groove. In feeding they do not protrude the stomach, but pass the food into the mouth by means of the tube-feet.

The Sea-urchins may be considered as starfishes whose upper surfaces have almost disappeared, the arms curled up to show the under side and coalesced, the nodules become spines amongst which are to be found the tube-feet. They live among rocks in which they make holes.

The Sea-cucumbers are echinoderms in which the under surface is represented by the mouth end and the upper surface by the other extremity. The tube-feet are modified into branched tentacles round the mouth. Internally are vestiges of the ambulacral grooves.

The *Crinoides* are now almost extinct. They grew on a jointed stalk. Their modern representatives, the feather-stars, break off from the stalk when mature and swim freely.

Friday, April 20th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There was a good attendance of members.

**Mr. C. O. Bartrum, B.Sc.,** read a paper on **"Some Present Views on Variation and Heredity."** He said that all animals and plants began existence as one single cell formed by the union of two cells from two parents. The nucleus determined the character of the offspring. Weismann, about twenty years ago, propounded a theory as to the "mechanism" in the cell nucleus whereby the heritage is passed from parent to offspring, involving the principle of non-inheritance of acquired characters. This principle is now generally accepted. Galton has likened the main line of heredity to a chain-necklace and personalities to pen-

dants attached to the links. Each character of an animal or plant may be attributed to two factors, "nature," which can be transmitted, and "nurture," which cannot be. Breeders improve their stock by selecting variations, not by nurturing individuals.

The lecturer next dealt with the work of Mendel in heredity. Describing Mendel's experiments in hybridising peas, he showed how on certain hypotheses the results may be accounted for. Still, the origin of characters was as complete a mystery as ever. The merely negative proposition that they do not originate as the direct effect of use being all that has been established.

Friday, May 11th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There was a large attendance. This meeting was devoted to blackboard demonstration.

**Mr. Hugh Findon, F.L.S.,** showed **"How Pond Mussels Breath Air."** By means of diagrams in chalk of sections of the gills of *Anodon cygnea*, he demonstrated how the air passed from the aerated water through the tissue of the branchiæ to the hæmolymph, or colourless blood of the animal, and also the action by which a constant stream of fresh water is caused to flow past one side, to penetrate the curtain of gills, and to be ejected from the shell again. The actual gills of preserved specimens were exhibited for members to examine their structure.

**Miss Garlick** gave a demonstration on **"Useful and Interesting Plants of the Natural Order Myrtaceæ."** In this order the seed vessel is joined to the calyx-cup and the stamens start from the ring which borders the cup. The calyx-lobes form a crown to the ripe fruit. To this order belong the pomegranate, guava, allspice, clove, etc. In the clove, the flower bud, which we use as spice, shows clearly the relative positions of calyx-lobes and seed vessels, but the stamens are enclosed in the folded petals and seldom observed.

In eucalyptus flowers the part of the calyx unattached to the seed vessel separates horizontally and comes off like a lid when the flower is mature. Such horizontal fission is unusual, but another example is furnished by the fruit of *Bertholittia excelsa* of the allied order *Lecythideæ*, the seeds we call Brazil nuts. This fruit is round, about six inches in diameter, its woody shell is half-an-inch thick, and contains one to two dozen seeds round a woody axis.

Miss Garlick exhibited the stems, leaves, buds and fruit of clove; branches of eucalyptus, with buds, flowers and fruit; and the fruit and seeds of *Bertholittia.*

Friday, November 9th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There were thirty-five persons present. A vote of thanks was passed to Dr. J. W. Williams, the late secretary and founder of this Section, on his retirement, in recognition of his many services to the Society.

**Mr. J. T. Cunningham, M.A.,** read a paper on "**Recent Research in Hereditary and Evolution.**" He said one of the most important problems in evolution was the origin of variations. Lamark and Darwin had each investigated the subject.

The lecturer explained experiments he had made with flat fish by keeping them in a wooden tank with a glass bottom and darkened above. The under side of the fish became pigmented. He illustrated this experiment and other parts of his paper with lantern slides. By keeping two long-tailed Japanese cocks he lengthened the tail feathers of one six inches as judged by the unstroked fowl, by stroking them, as the Japanese are reported to do. Two horned horses that had been under his personal observation were described. The horns were bony outgrowths of the frontal bones, about three quarters of an inch high, in the correct position for horns in species where they were normal.

He held that spontaneous mutation, individual stimulation, and natural selection were all responsible for evolution.

Friday, December 14th. Sir Samuel Wilks, Bart., F.R.S., in the Chair. There were thirty-one persons present. Mr. Hugh Findon, F.L.S., exhibited specimens of *Murex crinaceus Linné* and *Limnæa palustris Mull.* from various localities, showing the effects of environment.

*Stalactites, Stalagmites,* Cave Bones and Teeth were exhibited by Mr. F. W. Rudler, I.S.O., F.G.S.

A variety of Meadow Brown *Epiniphele ianira* captured at Weisbaden, was exhibited by Mr. A. Hinderlich.

**Mr. Thos. W. Reader, F.G.S.,** read a paper on "**Caves, Caverns and Grottos,**" which he illustrated by one hundred and seventeen lantern slides, and a scintillating screen for views of *Stalactites.* He divided caves into four classes, namely, sea-caves, fissure-caves, volcanic caverns, and waterworn caverns. The formation and destruction of sea-caves were first described.

Fissure-caves were shown. These are caused by earth movements, and are generally choked with *débris.*

Volcanic caverns are not common. They are found in lava flows. Views of such in the Sandwich and Canary Islands were thrown on the screen.

The origin and appearance of waterworn caverns were described, and many photographs were shown of the underground rivers which flow through them, chiefly from Derbyshire.

After these, views of stalactite formations were exhibited on the special screen. They were exceedingly beautiful in form and brilliantly white.

## Outdoor Meetings.

On Friday, July 6th, by the kind permission of Sir George Barham, J.P., Vice-President, a visit was paid to Ken Wood Farm. The unique section of the Bagshot Beds was examined, and an address on the subject was given by Mr. F. W. Rudler, I.S.O., F.G.S. Tea was kindly provided by the Directors of the Express Dairy Company.

On Saturday, September 29th, a ramble was taken to observe the fruiting of the hedgerow trees in the neighbourhood of Totteridge Green, under the direction of Mr. Hugh Findon, F.L.S., and Mr. James E. Whiting. Tea was taken at the "Orange Tree" Inn, Totteridge.

On Thursday, October 18th, a visit was paid to the Royal Mint, by the kind permission of the Deputy Master. A larger number of members were present than could be admitted. It is hoped to arrange another date when a further number may be admitted.

## Nature Study Course.

Three Lectures, with practical work for the students, were given by Mr. Wilfred Mark Webb, F.L.S., lecturer on Biology and Nature Study to the Surrey County Council. Fee for the course, to members 3s., to non-members 4s., admission to a single Lecture 1s. 6d.

### SYLLABUS.

Lecture I.—Monday, January 29th.

Nature-Study, its aims and place.—Work that is possible under present and particular conditions.—Materials for directed and suggested Nature-Study.—Pets.—School garden.—Observational Lessons.—A theory of natural education.

Lecture II.—Monday, February 19th.

Rambles and directed work in the fields.—Collecting, discriminate and indiscriminate.—The bent of the teacher.—Directions that may be followed.—Developments of Nature-Study.—Research.

Lecture III.—Monday, March 5th.

Records of Nature-Study.—Diaries, drawings, photographs and survey maps in regard to continued observations.—The school museum: what it is, what it may be, and how it can be a help to Nature-Study.

## Christmas Juvenile Lectures.

The following Lectures for children were given during the Christmas holidays :—

Thursday, January 4th, "A Seasonal Talk on Holly and Mistletoe," with illustrations. Miss Dora Nuth.

Thursday, January 11th, "Extinct Monsters," with lantern illustrations. Rev. H. N. Hutchinson, B.A., F.G.S.

Thursday, January 18th, "Flies and how they Disappear," with lantern illustrations. Mr. Henry Hill.

Children of members were admitted free, other children on payment of 6d. each.

### RULES OF THE SOCIETY.

Copies of the Rules may be obtained on application to the Honorary Secretary, 12, Heath Mansions, Heath Street, N.W.

## Photographic Section.

COMMITTEE 1906.

Miss Blyth, Miss Homfray, H. B. Curwen, R. W. Wylie, O. C. Quekett and H. Nevil Smart (Hon. Sec.)

Fair progress has been made in this Section in the past year, and the average attendance at the fortnightly meetings has increased.

The Annual Exhibition was held on December 5th and 6th. There were considerably more exhibits than last year, and the standard of the work was well maintained. Mr. A. H. Blake, M.A., acted as judge and made the following awards :—

Silver Medal to Mr. O. C. Quekett, for his contact print " Among the Beeches." Bronze Medal to Mr. H. B. Curwen, for his picture, " London's Highway."

Certificates were also awarded in the Portrait and Figure Study Class to Mr. J. P. Bushe-Fox (first) and Mr. Bertram Park (second). Architecture Class to Mr. R. W. Wylie (first) and Mr. H. B. Curwen (second). Landscape and Seascape Class, to Mr. E. Staniland Pugh, and in the Direct Contact Class, to Mr. J. P. Bushe-Fox and Mr. H. Nevil Smart (bracketted equal). A certificate was also awarded to Mr. O. C. Quekett, for a Reproduction of an Old Engraving.

Every member of the Section has now been invited to join the Portfolio Circles, of which there are two, one for the more advanced workers, and the other for beginners. The new system has not been in working order very long, but shows every sign of being very successful.

The following meetings were held during the year :—

Wed. Jan. 10.—Architectural Photography (illustrated with slides), by P. H. Williams.

Fri. Jan. 26.—" Japanese Art," by C. P. Small.

Wed. Feb. 7.—Demonstration " Copying," by O. C. Quekett.

Fri. Feb. 23.—Members' Lantern Night.

Fri. March 23.—" Colour Photography," by Mrs. Edward Shenton.

Wed. April 4.—Portraiture and Figure Study, by E. O. Hoppé.

Wed. April 25.—Flower Photography, by Edward Seymour.

Sat. June 16.—Summer Outing to ' Chenies.'

Wed. Nov. 7,—The " Amateur Photographer " Prize Slides. The Royal Photographic Society's Competition Prints.

Dec. 5-6.—Annual Exhibition.

## BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

### Conference of Delegates of Corresponding Societies at York.

*Report to the Hampstead Scientific Society of its Delegate.*

The Conference of Delegates from the various scientific societies in correspondence with the British Association, was held at York, on August 2nd and 7th, and was attended by your Delegate, who acted as Secretary of the Conference. There are at present eighty "*Affiliated* Societies"—a group limited to such societies as undertake local scientific investigations and publish the results. A new class of corresponding societies was, however, established a short time ago under the title of "*Associated* Societies." This includes such societies as are formed for encouraging the study of science, but need not be original publishing bodies. Of this new group there are as yet only thirty societies, of which the Hampstead Scientific Society is one.

The first meeting at York was presided over by Sir Edward Brabrook, C.B., who referred to the Conference as being the first at which the new Associated Societies were represented. He insisted on the value of such meetings in bringing the representatives of local societies into personal relations, and stimulating their efforts to improve the working of their respective institutions. The meeting was mainly occupied by a discussion of the way in which local societies could assist in meteorological work—a subject which was ably introduced by Dr. Hugh Robert Mill, the well-known authority on rainfall. If the Hampstead Scientific Society should at any time undertake systematic observations in meteorology, the suggestions in his paper will be most helpful.

The Chairman of the second meeting was Mr. John Hopkinson, of the Hertfordshire Natural History Society, to whose initiative some five-and-twenty years ago these annual conferences were largely due. The present meeting was chiefly devoted to the reading and discussion of a paper on "The Desirability of Promoting County Photographic Surveys," by Mr. W. Jerome Harrison, of Birmingham. The author was entitled to speak with authority, inasmuch as he was mainly instrumental in founding the survey movement, having pleaded as far back as 1889 for a photographic survey of Warwickshire. As the Hampstead Scientific Society has a flourishing Photographic Section, the subject is one of great interest to us; and the representatives of that Section will read Mr. Harrison's paper with much interest. The paper, with the discussion, has been published in the official Report of the

Conference, copies of which have been sent by the Association to our President and one of our secretaries. In the course of the discussion, Professor H. H. Turner, of the University Observatory at Oxford, pointed out the great value of taking pairs of photographs on the stereoscopic plan, as explained in his paper "On a simple method of accurate Surveying with an Ordinary Camera" (Monthly Notices, R. Astronomical Society, December, 1901, LXII., 126). It is probable that Mr. Harrison's suggestions as to County Surveys will be brought forward for renewed discussion at the meeting of the British Association at Leicester in 1907.

F. W. RUDLER.

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## SOUTH EASTERN UNION OF SCIENTIFIC SOCIETIES.

### CONGRESS AT EASTBOURNE.

*Report to the Council of the Hampstead Scientific Society of its Delegate at the Congress.*

I attended the Congress of the South Eastern Union of Scientific Societies held at Eastbourne last June, as delegate of our Society.

There were present delegates from twenty-eight societies, and a number of valuable papers were read. Conspicuous among them was that of Mr. Jonathan Hutchinson on "The Educational Value of Museums." This should be circulated widely and placed in the hands of every body of local government and every scientific society.

I fear our Society does not realise the benefits which accrue to it through affiliation with the Union. There is a long list of names of expert referees in various branches, whose knowledge is at our service. Lecturers are willing to come to us, in many cases for expenses only. Lantern slides and lectures are to be had on payment of carriage. Our Society will benefit by its affiliation in exact proportion as it makes use of the Union.

As it seems right for us to make some return, I propose to submit my name as a lecturer of the Union.

The object of the Union is, of course, to bring workers in science into closer touch, and I have reason to believe that it would, in some future year, welcome an invitation to hold its Congress in our midst.

HUGH FINDON.

# List of Members.

***Corrected to March 1st, 1907.***

**Members are particularly requested to notify any change of address to the Hon. Secretary of the Society, 12, Heath Mansions, Heath St., Hampstead, N.W.**

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# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY.






1907.

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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## With a List of the Members.

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*For the Year* 1907.

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AYLESBURY

THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

A General Meeting of the Society is held on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 precisely. Meetings of the Astronomical Section take place from time to time as they can be arranged. The Natural History Section meets on the second Friday in each month, and the Photographic Section twice a month.

The first General Meeting takes the form of a Conversazione at the Town Hall. All other meetings are held at the Hampstead Subscription Library, Prince Arthur Road.

During the summer months Out-door Meetings are organised.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretaries, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned.**

C. O. BARTRUM,
R. W. WYLIE, } *Hon. Secretaries of the Society,*

12, Heath Mansions, Heath Street,
Hampstead, N.W.

*February*, 1908.

gift of £10 from a friend of Sir Samuel Wilks, have been received. The statement shows a balance in the hands of the Hon. Treasurer at the end of the year. The Society owes its thanks to the large number of members who have subscribed greater sums than the minimum. To these members is due the present satisfactory state of the Society's finances.

Twenty-nine meetings, including two vacation meetings, have been held. The value and interest of the lectures given before the General Meetings have been as high as in former years. It has been decided to hold the General Meetings during the session 1907-08 at the new hall at Stanfield House instead of at the Town Hall, the former being more convenient of access to the majority of members. The Annual Conversazione was held on November 1st at the Town Hall. It was well attended and was much enjoyed. The thanks of the Society are due to Dr. C. W. Andrews, F.R.S. for the valuable lecture he gave on that occasion.

A course of three lectures on Astronomy were given this winter by Mr. Vizard, and were much appreciated.

A Committee of four members has been appointed by the Natural History Section to assist the Secretary with the work of the Section and with the field meetings. It is satisfactory that a larger number of Natural History members have come forward to give the Section the benefit of their individual knowledge, and to interest others with their exhibits. The Secretary is anxious to learn more as to the private work that is being done by members.

The Photographic Section has shown its usual enthusiasm for its work, and has been the means of adding many new members to the Society.

The proceedings at the General and Sectional Meetings will be found on pages 11–24.

At the Conference of Corresponding Societies of the British Association held this year (July 31st-Aug. 6th) at Leicester, Mr. C. O. Bartrum represented the Society as Delegate. His report of the Conference will be found on page 25.

The Annual Congress of the South Eastern Union of Scientific Societies was held at Woolwich in June. Our Vice-President, Prof. Silvanus P. Thompson, was President of the Congress. Mr Hugh Findon attended as Delegate of the Society. His report will be found on page 26.

In July, 1906, the suggestion was made by the Chief Officer of the Parks Department of the London County Council, that the telescope and observatory house on the East Heath should be removed, as little use appeared to be made of them. The Council of the Society, on considering the matter, decided that it was advisable to look for a new site, as the present one was subject to atmospheric disturbances and was difficult and unpleasant of access at night. At about the same time a more valuable reflecting telescope, equatorially mounted, was generously offered to the Society by Dr. Frederick Womack which was worthy of a better site. On May 31st, of the past year, therefore, an appeal was made to the London County Council to allow a small astronomical observatory house to be erected in the Flagstaff enclosure, together with some

meteorological instruments to be placed on the ground around the house. With the appeal the offer was made that the observatory should be available for the use of teachers and senior pupils of London County and other schools and colleges, and of the public under suitable regulations. It was pointed out that the Meteorological Station which the Society proposed to establish would serve a valuable public purpose, as such a station was much needed on the summit of Hampstead Hill. This appeal was warmly supported by Sir Norman Lockyer, Professor Silvanus P. Thompson, Dr. Hugh Robert Mill (Director of the British Rainfall Organisation), Dr. W. N. Shaw (Director of the Meteorological Office), and by the Council of the Royal Meteorological Society. The Parks Committee of the L.C.C., carefully considered the proposal, and in view of the benefit to the public that would accrue, agreed to it without opposition and advised the Council to accede to the appeal. A licence bearing the seal of the Council was received on October 9th.

Subsequently a vigorous correspondence took place in the local and London press, in which considerable opposition was manifested to the establishment of the proposed Astronomical and Meteorological Observatory. In consequence of the opposition the Council of the Society did not proceed with the matter and the licence has since been withdrawn.

The Council is at present in treaty for the use of a suitable site on private land for the erection of the Observatory, and also hopes to find a good position for a Meteorological Station.

# STATEMENT OF ACCOUNTS.

*For the Year ending 31st December, 1907.*

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1907 Subscriptions paid in 1906, brought forward ... ... ... ... | 10 | 12 | 6 |
| 1907 Subscriptions... ... ... ... | 69 | 18 | 0 |
| | 80 | 10 | 6 |
| 1906 Subscriptions paid in 1907... ... ... | 9 | 15 | 6 |
| 1905 ,, ,, ,, ... ... ... | 1 | 10 | 0 |
| Conversazione and Lecture Tickets ... ... | 2 | 4 | 0 |
| Ordinary Receipts during 1907 ... ... | 94 | 0 | 0 |
| Donations— | | | |
| A Friend of Sir Samuel Wilks ... | 10 | 0 | 0 |
| Ditto ... ... ... ... ... | 1 | 1 | 0 |
| Miss E. M. Stevenson ... ... ... | 1 | 0 | 0 |
| Miss Lister ... ... ... ... | 0 | 10 | 0 |
| Mr. M. Yeatman Woolf ... ... | 0 | 10 | 0 |
| | 13 | 1 | 0 |
| | £107 | 1 | 0 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... | 12 | 11 | 6 |
| Printing and Delivering Report ... ... | 8 | 17 | 6 |
| Rent Town Hall ... ... ... ... ... | 9 | 19 | 6 |
| Rent Stanfield House ... ... ... ... | 9 | 6 | 6 |
| Advertisements ... ... ... ... ... | 6 | 17 | 0 |
| Photographic Section ... ... ... ... | 6 | 7 | 6 |
| Natural History Section... ... ... ... | 0 | 11 | 9 |
| Conversazione ... ... ... ... ... | 15 | 7 | 7 |
| Subscription to Royal Photographic Society... | 1 | 1 | 0 |
| S.E. Union of Scientific Societies ... ... | 0 | 7 | 6 |
| S.E. Union Meeting ... ... ... ... | 0 | 9 | 6 |
| Lecturers' Expenses ... ... ... ... | 1 | 3 | 0 |
| Postages ... ... ... ... ... | 8 | 3 | 0 |
| Clerical Assistance ... ... ... ... | 3 | 3 | 0 |
| Lantern and Gas ... ... ... ... ... | 1 | 13 | 8 |
| Notice Boards ... ... ... ... ... | 0 | 15 | 6 |
| Sundry Expenses, per Hon. Secretary ... | 3 | 2 | 11 |
| Expenditure during 1907 ... ... | 89 | 17 | 11 |
| Deficit brought forward, 1/1/07 ... ... | 12 | 1 | 10 |
| | 101 | 19 | 9 |
| Balance in hand ... ... ... ... | 5 | 1 | 3 |
| | £107 | 1 | 0 |

Subscriptions in hand for 1908 paid in 1907, £5 14s. 6d.

E. COMPSON CRUMP, *Hon. Treasurer.*
24th January, 1908.

*Audited and found correct,* { E. S. PAYNE, WALTER SCHRÖDER

# EPITOME OF EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Astronomical Section ... ... ... ... ... ... ... | 1 | 15 | 6 |
| Natural History Section ... ... ... ... ... ... ... | 3 | 15 | 3 |
| Photographic Section ... ... ... ... ... ... ... | 12 | 6 | 0 |
| General Meetings ... ... ... ... ... ... ... ... | 6 | 18 | 11 |
| Conversazione ... ... ... ... ... ... ... ... | 20 | 6 | 2 |
| Report, Printing and Delivery ... ... ... ... ... ... | 8 | 17 | 6 |
| S.E. Union Subscription ... ... ... ... ... ... ... | 0 | 7 | 6 |
| S.E. Union Meeting ... ... ... ... ... ... ... | 0 | 9 | 6 |
| Vacation Meetings... ... ... ... ... ... ... ... | 0 | 10 | 4 |
| Royal Photographic Society ... ... ... ... ... ... | 1 | 1 | 0 |
| Advertisements ... ... ... ... ... ... ... ... | 7 | 15 | 0 |
| Observatory Scheme Expenses ... ... ... ... ... ... | 1 | 0 | 10 |
| Sundry General Purposes ... ... ... ... ... ... | 24 | 14 | 2 |
| | £89 | 17 | 11 |

# Abstract of Proceedings,

1907.

## General Meetings.

Friday, January 4th. Sir Samuel Wilks, Bt., M.D., F.R.S., President, in the chair.

**Miss Marie C. Stopes, D.Sc., Ph.D.,** gave a lecture entitled **"Some Missing Links in the Plant World,"** illustrated with lantern slides. The lecturer first pointed out the real meaning of the popular expression, "Missing Link." It denotes a race of organisms now extinct, which were in a distant past the remote ancestors of two or more races living at the present day which present characters distinct from one another. No living monkey is a "missing link" with man. The term would be correctly applied to an ape-like ancestor of man forming a link between the present races of man and the apes. Just as the people of to-day are the direct descendants of old families, some of which have prospered greatly, while others may have become extremely reduced and even died out, so in the plant world all the families of plants to-day living are the representatives of the many ancient families which have inhabited the earth in time past. In these lost families, which we now know only as fossils, are to be found proofs of "blood relationship" between families now living which we should never imagine to be connected. In the rocks of all ages some records of plants are to be found; but most of these are very fragmentary, except in the period of the coal measures. Slides were shown illustrating the perfection of the preservation of plant tissues from these beds. In many cases the minute anatomy shown by these sections is as well ascertainable as by sections from living plants. Among the plants of this age which we know specially well is the giant *Lepidodendron*, the remote ancestor of our small present day "club mosses." Slides were shown of the structure of this plant, illustrating its likenesses to and differences from the living club mosses. In this case the course of evolution had been one of degeneration rather than of progress. A second example from the coal measures was described in *Calamites*, the huge representative of the present day water

" horse tails." These two families—the club mosses and the " horse tails "—seem to-day far apart and very unlike in their structure ; but it was pointed out that in *Cheirostrobus*, a unique form from the lower coal measures, proof was seen that the two families had a common ancestor. *Cheirostrobus* presents characters pointing to both these families, and, though not itself the actual " missing link," is yet related to it and shows that such a link once existed. The family of ferns was next considered. Until three years ago the fern-like plants of the coal measures were all thought to be true ferns. The complex organs known as seeds, characteristic of the higher forms of plants developed in the evolutionary process in later ages, were not known to have existed at the time the coal measures were formed. Lately, however, it has been shown that many of the fossils in these rocks that look so like ferns are really true " missing links," bearing complex gymnospermic seeds on their leaves. A connecting link is thus found in these remote ages between the true spore-bearing ferns and the gymnosperms, especially cycads, of the present day. The story of the discovery of seeds in *Lyginodendron* was told and its importance emphasized. The lecturer deplored that at present there were no true links known between the flowering plants and other families, and suggested that, when the Mesozoic beds become as well known as are the Palæozoic, something of the kind would be discovered.

On Friday, February 1st, the Annual General Meeting was held, under the presidency of Sir Samuel Wilks, Bart., F.R.S., the President. The Report of the Council was read and adopted. The President, Officers and Council were elected.

The meeting was resolved into an ordinary meeting.

**Prof. E. H. Starling, M.D., F.R.S.,** gave a lecture on **"The Mechanism of Digestion,"** illustrated with experiments. The lecturer began by pointing out a fundamental difference between the animal body and inanimate engines. It differs in having no separation between the part supplying energy from combustion and the working parts. Muscles use their own material to obtain energy, and are themselves the working parts of the body. Hence food materials require to be altered into such forms as can pass through the tissues into the blood—they must be rendered soluble. Food stuffs are found to contain substances belonging to one or more of the following groups, together with a varying quantity of water :—1. Nitrogenous substances containing nitrogen, sulphur, carbon, hydrogen, and oxygen. These are necessary for the building up of the tissues. 2. Carbohydrates, as starch and sugar, containing carbon, hydrogen, and oxygen, which serve to supply

energy. 3. Fatty substances, also containing carbon, hydrogen, and oxygen, which supply heat and energy in an especial degree. Food in the alimentary canal is of no more use than when outside the body. To become useful it must be rendered soluble and passed into the blood and thence to all parts of the body. It is the function of digestion to bring about this change.

The lecturer dealt in order with the different portions of the alimentary canal and the functions of each. Into the mouth open the ducts of the salivary glands. The presence of food in the mouth by reflex action causes these glands to secrete saliva, a message being sent along the nerves to a centre in the brain, and a reply message being received by the glands. The function of the saliva is not only, as in the case with carnivorous animals, to assist in mastication and in swallowing; it also has the power of transforming starch into sugar, thus rendering it soluble. The lecturer showed this by an experiment. He took into his mouth a small quantity of starch and water, and after ejecting it into a test tube proved that the starch had entirely disappeared. The walls of the stomach contain glands which at the presence of food, or the mere smell or thought of food with a hungry subject, secrete the gastric juice. This contains dilute hydrochloric acid and other substances which in turn dissolve and break up other constituents of the food. As the process in the stomach is completed small portions at a time are allowed to pass by a valve into the small intestine into which open the bile ducts from the liver and the ducts from the pancreas. The secretion of the last is brought about by "special messenger," and not by the telephone method of reflex action. A constituent of the partly digested food passes into the blood and thence reaches the pancreas, which is excited into active secretion. By the pancreatic juice the process of conversion of starch into sugar is completed. In the intestine the nitrogenous substances in the food are converted into proteids suitable for absorption by the blood. Fats are also rendered soluble by conversion into soaps or into emulsions, and are absorbed. Thus useful constituents are removed from the food during its passage along the great lengths of the small and large intestines.

After the lecture some interesting replies were given by Prof. Starling to questions asked. As regards the relative value of different foods, he said that meat was by no means of the great importance generally attributed to it. As shown by various races of men, equally efficient nourishment could be obtained from a diet consisting solely of vegetable food. In the case of growing children he considered it wiser to run no risk and to give them animal food; but the full-grown labourer could subsist perfectly well on bread and butter and leave the steak for the children.

The very different results obtained by investigators as to the minimum quantities of the constituents of food that should be taken he attributed to the mistake of considering all proteids as of equal value.

In reply to another question, the lecturer said he attributed any dyspepsia that may arise from tobacco smoking to disturbance of the proper reflex responses of the glands, due to a more general disturbance of the nervous system. What could be excessive indulgence in tobacco to one man would be but moderate to another, owing to constitutional differences.

Sea-sickness, he thought, was due to the continual conflict of impulses to adjust the body to the rolling movements, given through the eyes, the semi-circular canals of the ear, and the muscular sense. This conflict disturbs the portion of the brain whose function is to correct for equilibrium, and the disturbance is transmitted to the neighbouring portion that controls the digestive organs.

Friday, March 1st. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

**Mr. M. Yeatman Woolf, F.Z.S.**, gave a lecture on **"Sponges, their Life-History and Development,"** with lantern illustrations. There were three classes of sponges—calcareous, flinty, and horny, the last being the most degenerate, culminating in the skeletonless slime sponge. Most sponges have spicules, and, according to the complexity of these, students can tell the high or low stage of development of the animal. Many spicules, especially the flinty kinds, are exceedingly beautiful. The lecturer explained how the sarcode or flesh of the sponge was composed of divers kinds of cells, each one of which has its own particular duty to perform, either in nutrition, growth, or reproduction, and how this sarcode was strengthened by the spicules distributed throughout it.

Details were given of the curious structure of the whip cells that, in the simplest sponge, line its tubular cavity, but in the case of more complicated forms are restricted to chambers along those canals which ramify in the body of the creature. The duties of such cells, which, in all cases, are the keeping up currents of water and the obtaining of food, were touched upon, and from this Mr. Woolf passed to the numerous cells, whose task it is to form the skeleton.

Reproduction takes place by eggs, by budding, and by the simple division of the animal into parts. The bath sponge is a horny sponge, in which the skeletonic needles are replaced by horny fibres.

At the close of the lecture, the true flinty sponges which

naturalists know as the " glass rope sponge " and " Venus's flower basket," were described and illustrated. These, which are among the most beautiful of natural history objects, would hardly be regarded as sponges at first sight, and show that the subject of sponges is by no means limited to those we use for domestic purposes.

Friday, April 12th. Sir Samuel Wilks, Bart, F.R.S., President, in the chair.

**Mr. R. W. Wylie, M.A.,** gave a lecture on **" Some Scientific Elements of Photography,"** with lantern illustrations. The lecturer said that light has a visible effect on many substances. It fades our carpets and wallpapers. On a photographic plate, exposed in a camera, it has an effect which is invisible ; it produces a latent photographic image, which can be developed at once, or after months or years. Opinions differ as to the nature of the change produced by the light. Some hold that the light decomposes the silver-bromide of the plate into silver-sub-bromide and bromine ; others maintain that the light makes only a physical, but not a chemical change, having merely reduced the silver-bromide to a state in which it is more easily converted into sub-bromide by the developer. After development, plates must be fixed in hyposulphite of soda. The permanency of negatives and prints depends not only on thorough washing after fixing, but on thorough fixing before washing. A perfect negative can only be obtained from a plate which has been correctly exposed. However carefully a badly-exposed plate be developed, the resulting negative will be imperfect, by reason of its half-tones being either too dark or too light. Ordinary plates are partly colour-blind, being comparatively insensitive to light which is green, yellow, or red. Plates are now made, called orthochromatic plates, which are far more uniformly sensitive to the different colours. Such plates give a much more truthful representation of a coloured subject. In the case of photographs taken for any scientific purpose it is important to know whether the photographic image is a trustworthy thing or whether the camera has lied. Whether it is trustworthy or not depends upon the lens and upon the photographer. Single lenses produce distortion, by rendering straight lines as curved ones. Doublets do not do this ; but they will not define perfectly up to the margin of the plate unless they are made of the new " Jena " glasses. These glasses were first produced in Jena, by a firm of opticians who wished for better optical glass. They undertook an exhaustive series of experiments, taking the best scientific advice at every step ; and their success well illustrates the advantage of introducing scientific method into an industrial

enterprise. However perfect the lens, the photograph will not be trustworthy unless the photographer takes care to keep the plate vertical in the camera; and even then, if a wide angle of view be included, there will still be such distortion near the margin as is inherent in all representations of solid objects on a flat surface.

Friday, May 3rd. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

**Dr. Arthur John Hubbard** and **Mr. George Hubbard, F.S.A., F.R.I.B.A.**, gave addresses on "**The Works of Pre-historic Men in the South of England.**" Dr. Hubbard began by attempting to estimate approximately the date of the period which is spoken of as the Neolithic Age. He said that the Christian Era was approximately 2,000 years old. At the commencement of the Christian Era Stonehenge was approximately 2,000 years old. When Stonehenge was brand new then the Great Pyramid was approximately 2,000 years old. When the Great Pyramid was brand new then the Sphinx was in need of repair. He was inclined to refer the earthworks on the English Downs rather to the period of the Sphinx than to that of the Great Pyramid. Two phases of culture can be defined in the age which is known as the Neolithic Age—the earlier Hill Period and the later Plain Period. The men of the Hill Period were exclusively earth-workers, and lived only upon the hill-tops. As a justification of speaking of a life which was lived at such an extremely remote period, Dr. Hubbard pointed out that on the uplands of the Downs the turf has preserved for us the works of a man in a manner which would be impossible elsewhere. The earthworks of the later period fall into four groups :—1. Embankments and trenches. 2. Cattle-ways. 3. Level platforms. 4. Dew Ponds. Embankments and trenches.—These, as in the case of all the camps on the top of the Downs, are breast-works, and were evidently designed to afford protection against projectiles fired at short range. These camps were the forts in which pre-historic man defended himself against the arrows of his human adversaries, and here, also, his cattle were herded. He then referred to the cattle-ways, giving as an instance the cattle-ways on Cissbury Camp or Hill, Devil's Dyke. He next dealt with the question, why men in this period lived only upon hill-tops, finding the answer in the existence of level platforms at the bases of the hills in some parts of the country known as "Shepherd's Steps." These gigantic platforms, being breast-works, were intended as a protection against a foe who used no projectiles, and, being always at a distance from the camp, as a defence against an enemy whose operations were intended to secure a part in the cattle. This enemy was the wolf, and an instance was given

in which the level wolf platform was found in company with the embankment. The Dew Pond.—It was evident that this life on the hill-tops could only be lived if water could be obtained from the summit of the Downs. Dr. Hubbard pointed out that there was a great deal of converging evidence showing that pre-historic man had watered these platforms by means of the Dew Pond. He explained the natural causes which induced the dew to be deposited in these ponds, and pointed out, how, if this system were adopted in waterless lands, countries which were barren to-day might be made fertile.

Mr. George Hubbard said that it was not till after man had gained some mastery over the wolf that he was able to descend into the plains, and that his work in the plains represented the second period of Neolithic man's existence in these Isles. The main difference between the Hill Period and the Plain Period lay in the fact that man worked in the earth on the hills and in the plains he built in stone. Mr. Hubbard described the hut circles on Dartmoor, which represented the earliest evidence of man's built habitations in these islands. These small dwellings, often not exceeding five or six feet in diameter, and only about three or four feet in height, were the abodes of our ancestors. These circles are generally found in the immediate neighbourhood of the old Phœnician tin workings. To the Phœnicians these islands were known as the "Islands of Tin," and the Arabic for this is "Bahrut anuk," and the Hebrew is "Baratanac." From Baratanac to Britannic is such an easy step that it seems probable that the name of Britain was derived from these early Phœnician settlers. The greater number of stone alignments and circles had an astronomical significance, as has been pointed out by Sir Norman Lockyer. Mr. Hubbard described these astronomical bearings, and pointed out that they were to a very large extent similiar to the astronomical bearings upon which the Egyptian temples had been planned. He did not consider that these works had any special religious significance, but he regarded them as being purely scientific and astronomical. The necessity of being able to measure the length of the year was of primary importance, and the peculiar interest of these early monuments was shown in their early attempts to make this calculation. At considerable length Mr. Hubbard described a curious earthen structure which he discovered on Firle Down, near Lewes. It consisted of an outer circular embankment which was nearly complete, including three segments of an inner concentric circle. Within these segments was a concentric square depression, and lying outside this entire figure were certain subsidiary earthen structures. These earthworks have not hitherto received attention, but, in his opinion,

they are more complete than any other structures of a similar period, inasmuch as, by drawing lines from the centre of the square through the centre of the openings between the segments of the inner circle, the points on the horizon are struck where the sun rises and sets at the Winter Solstice, or on the shortest day of the year. In a similar manner, if lines are drawn from the centre of the square through the north angles of the square, the points on the horizon are struck where the sun rises and sets at the Mid-summer Solstice, or the longest day of the year. If again a line be taken from the centre of the subsidiary earthwork lying to the north-west of the centre, and the subsidiary earthwork lying in the south-east, it is found to pass over the centre of the square. The direction of this line indicates the point on the horizon where the sun rose and set in the old May Year. The old May Year was, he considered, a direct importation from Egypt and Chaldea, as in those countries, in an extremely remote period, the length of the year was measured from the time of the ripening of the crops in one year to the ripening of the crops in the succeeding year, and, as the crops ripened in May, the year was commenced in that month.

On Friday, November 1st, the Annual Conversazione was held to inaugurate the Session 1907–8. Sir Samuel Wilks, Bart., F.R.S., President, and Mrs. Vizard received the members and their friends. **Dr. C. W. Andrews, F.R.S.,** of the British Museum (Natural History), gave a lecture on **"Life in some Coral Islands,"** illustrated with lantern slides. The lecturer devoted the major part of his remarks to Christmas Island in the Indian Ocean, in the investigation of which he had spent some months. One of the points of greatest interest in his work is the light it has thrown on the much-discussed origin of Coral Atolls. Darwin propounded a theory which required investigation for its confirmation or confutation. The deep-boring made in the Pacific Island, Funafuti, in 1896 and the work of Dr. Andrews were undertaken for this purpose.

Christmas Island is a Coral Atoll, built on a foundation of volcanic rocks and of foraminiferal limestone, that has been raised some hundreds of feet by successive processes of elevation, and subsequently cut into by denudation. Its geological structure, therefore, can be read in the sections that have been exposed. It rises from very deep ocean, is about twelve miles in length, and contains about forty-three square miles of surface. Around its shore-line is a succession of terraces and cliffs, corresponding with successive periods of elevation. It consists of white coral lime-stone, lying on foraminiferal limestone containing intrusive basalt, this again on a basis of basalt.

The coral reefs with central lagoon are now represented by the limestone hills surrounding an inland plateau. Thick deposits of phosphite of lime have been formed in places from the remains of sea-birds in past ages.

The climate is like that of a hot English summer, tempered with sea-breezes, and is delightful and healthy. Good water abounds.

The island is thickly covered with forests of lofty trees, creepers binding their tops together. The mammalian fauna consists only of two species of rat, a shrew and two bats. The rats are in huge numbers; they entered the tent at night and ran over the sleepers. They are good climbers. One of the species of bat is remarkable for its habit of flying in bright sunlight. The island is the breeding place of vast numbers of sea-birds—gannets, boobies, frigate-birds, etc. These form the ample food-supply of the island. Several species of land-crab infest the trees of the forests. A remarkable feature of the fauna is the presence of four species of earthworm, two of which are peculiar to the island. As the nearest land is two hundred miles distant, and earthworms and their ova are destroyed by sea-water, their presence here is of interest.

A After the lecture, refreshments were served in the Small Hall. small orchestra played a selection of music during the evening. Natural History, Photographic, Meteorological and other exhibits were on view.

Friday, December 6th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

**Mr. A. D. Darbishire, M.A.,** gave a lecture on **"Mendelism,"** illustrated with the results of breeding experiments on mice and peas. The lecture consisted of a careful exposition of the phenomena accompanying hybridisation associated with the name of Mendel.

## Natural History Section.

The record of this Section for 1907 is on the whole satisfactory. Though the average attendance at the meetings was not so large as in the previous year, the number of exhibits has increased. Ten papers and demonstrations were given before the Section, two only of which were by visitors. The interest and usefulness of the meetings have been materially increased by the coming

forward for the first time of several members with papers and exhibits. It is hoped that others will follow their example.

Members are reminded that they have the privilege of bringing two friends to the meetings. The knowledge of such visitors may be of value to the meeting.

The meetings held at Stanfield House in 1907 were as follows :—

Friday, January 11th, Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

Sir Samuel Wilks exhibited sections cut from the Eared Elm of Hampstead, and Dr. Williams showed a section of the stem of Selaginella under the microscope and its flowering sprig.

**Mrs. Plomer Young**, of the "Battersea Field Club" read a paper on **"Timber and some of its Diseases,"** illustrated by lantern slides prepared by Mr. W. Plomer Young, F.R.M.S.

Mrs. Young described the broad principles underlying the growth of timber. The strength, durability, hardness, and colour are consequent on the structure, the nutriment obtained by the plant, and various salts and other substances deposited in the cells of the wood. The diseases Mrs. Young spoke of were those fungi which kill and disintegrate timber by living on its substance. She explained also the various methods which should be adopted for prevention and remedy. The dry rot fungus attacks dead wood only, the best preventive being ventilation.

Friday, February 8th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

Miss Garlick exhibited a fir cone found ten feet below the boarded bottom of the old Roman Moat at London Wall, and also the fruit of a stone pine for comparison.

**Mr. Herbert Goodchild, M.B.O.U.,** spoke on **"Bird Stations of the British Isles."** By means of a map he pointed out their situations. Lantern slides of the various species of birds inhabiting them were shown, and views of the stations with the birds on them taken near to and at a distance, the speaker describing each in turn and speaking on their mode of life. Many photographs of nests, containing eggs and young birds and in some cases the old birds sitting, were thrown on the screen. The Bass Rock and its birds were dealt with at length, Mr. Goodchild being well acquainted with it. The last series of views were of birds at rest and flying, making one wonder where the photographer found footing.

Friday, March 8th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

There were exhibited, the weapon of the Saw fish (*Pristis zyron*), a very large specimen by Mr. J. W. Hunter; also two cases of Tiger moths (*Arctia*) with their larvæ by Mr. Hopson, F.L.S., F.E.S.

**Mr. James A. Simes,** of the North London Natural History Society, read a paper on "**Wild Traits in Domestic Animals.**" The paper dealt with various habits in the Dog, Horse, Ass, Ox, etc., which have no present use and no apparent meaning unless their origin is sought in their wild ancestors. Thus, the dog turns round and round to prepare his bed among rushes which have disappeared; the ox lowers his head when alarmed to look under branches no longer there; while the horse raises his head to watch the horizon of plains on which he has ceased to dwell. The ass fears to enter water because of crocodiles which do not now lie in the shallows. Sheep are found on any rising ground available, a remnant of their mountain habits. Many other instances where habit has survived utility, had been observed by Mr. Simes and incorporated into his paper.

Friday, April 19th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

There were exhibited by Mrs. Allen the egg of a Great Alexandrine Parakeet (*Psittacus cupatrius*) laid in captivity. Sir Samuel Wilks exhibited a young larch pole that had been struck by lightning which had followed the spiral twist of the grain.

Mrs. Park spoke on a collection of Lias Fossils from Robin Hood's Bay, and Mr. Holmes exhibited, as a freak of nature, an oak gall resembling a bullock's heart.

**Mr. Hugh Findon, F.L.S.**, read a paper entitled "**Where Devon, Dorset and the Sea meet,**" being a study of World Demolition and Reconstruction. The paper dealt with eight miles of coast about Lyme Regis, from the time of the New Red Sandstone, the most ancient rock visible in the district, to the present age. He described nine successive worlds which had been formed only to be destroyed and replaced by others, and illustrated his descriptions with photographs of the cliffs taken from the beach for that purpose.

Friday, May 10th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

A raised geological map of the district round Hampstead and Stanmore, the work of the late Caleb Evans, having been presented to the Society by Miss Lister, a vote of thanks was moved by the chairman and carried unanimously. The map and a coloured

key map were subsequently framed and are now hanging in the old Lecture Room.

Mr. Henry Radcliffe showed some fossils from Surrey Chalk Flints. Mr. Hugh Findon brought up some rare Hawaiian Land shells, and Mr. Whiting sent a fine Belemnite (*B. Owenii*) from the Oxford Clay at Steeple Claydon, Buckingham, for exhibition.

**Mr. Goodchild, M.B.O.U.,** gave a demonstration on **"The Plumages of Ducks,"** illustrated by specimens, and **Mr. Hugh Findon** also a gave a demonstration on **Sinistrosity in Shells** with the aid of specimens, black board, and lantern slides.

Friday, November 8th. Sir Samuel Wilks, Bart., F.R.S., President, in the chair.

Miss N. Allcock exhibited horns and a skin of the Bush Buck from the veldt and the skins of two Bush Monkeys (*Cercopithecus samango*) from the bush of Griqualand East, and Mr. Findon spoke on a shell of a deep sea oyster bored by a parasitic sponge (*Clionella*).

Mr. Francis Baker brought thirty-two species of Fungi collected near Chingford, on the borders of Epping Forest, on Nov. 2nd.

**Mr. Henry Radcliffe,** spoke on **"The Flint Fossils of the Surrey Hills."** He had, he said, collected all his specimens from one hill quarry near Guildford. Many of his specimens, which were principally echinoderms, were exceedingly beautiful. The bed from which he had obtained them consisted entirely of flints from which the chalk had been denuded.

Friday, December 13th. Mr. J. E. Palmer in the chair.

A committee of four members was elected to assist the Secretary in the work of the Section and the outdoor meetings, viz., Mrs. Forbes, Mrs. Park, S. P. Allcock, and H. Pace.

Mr. A. Jukes Allen exhibited a basket of Crocodiles' Eggs from Gambia and the nest of a Tarantula spider from Jamaica.

Three short papers were read by members :—

**Mrs. Park** spoke on **"Plant Remains from the Carboniferous Period,"** and exhibited many excellently preserved fossils.

**Miss Garlick** read a paper on **"The Place of Ferns in Natural Classification,"** illustrated by dried specimens and diagramatic slides, and **Mr. Findon** showed four cases of **Helix nemoralis** and explained the variation in that species and the formula used to describe the banding.

On Saturday, July 6th, Mr. and Mrs. Montague Hopson invited those members who more regularly attend the Natural History meetings to their house to view their collection of British Butterflies and Moths.

## Astronomical Section.

A course of three Lectures were given by Mr. P. E. Vizard, F.R.A.S., on Saturdays, November 30th, December 7th and 14th, at 5 p.m. The lectures were for the most part of an elementary character, but included reference to the latest astronomical theories and discoveries.

SYLLABUS.—Ancient (Ptolemaic) and Modern (Copernican) Astronomical Systems; the difference between Planets and Fixed Stars; our Solar System; the "Fixed" Stars, their distances, number, distribution, colours, relative ages, &c.; Photography applied to the Heavens; Latest Astronomical Theory—two Universes: Are there other Inhabited Worlds?; How the Stars are suspended in space—Law of Gravitation; Effect of inclination of the Earth's Axis—the Seasons; Various movements of the Earth; the Moon, her phases, orbit, eclipses, &c.

## Photographic Section.

COMMITTEE FOR 1907.

Miss Blyth, Miss Homfray, H. B. Curwen, O. C. Quekett, R. W. Wylie, and H. Nevil Smart (Hon. Sec.).

The Work of the Section during the year has proceeded in a uniformly satisfactory manner, and the lectures and demonstrations have, on the whole, been very well attended. Particularly was this so in the case of the Holiday Papers which were given on March 20th, when the hall was filled to its utmost capacity.

The Annual Lantern Slide Competition was held on Feb. 20th, and Certificates were awarded to Mr. E. Staniland Pugh, Mr. J. B. King, and Mr. O. C. Quekett for the best slides shown, the results being determined by the votes of the Members present.

At outdoor meeting to Burnham Beeches took place on May 25th, but unfortunately the weather on this occasion left much to be desired.

The Annual Exhibition was held on Dec. 4th and 5th, and the work exhibited was quite equal to the usual standard—nearly one hundred photographs were hung. The average size was somewhat smaller. The late Mr. A. Horsley Hinton, the judge, congratulated the Society upon getting together a very interesting collection of pictures, and made the following awards :—

Silver Medal to Mr. Bertram Park for "The Floating Shade of Willows"; Bronze Medal to Mr. A. Denman Jones for "Figure Studies." Certificates :—Portrait Class, to Dr. C. F. T. Blyth, Mr. Bertram Park, and Mr. H. B. Curwen. Architecture Class,

to Mr. H. B. Curwen (2) and Mr. R. W. Wylie. Landscape and Seascape Class, to Miss Blyth and Mr. Bertram Park. Direct Contact Class, to Dr. Hugh Roger-Smith and Mr. O. C. Quekett. Mr. Quekett was also awarded two Certificates for copies of engravings.

The Portfolios were again a great success during the year, and in the case of the advanced folios the work shown was of a very high quality. The membership has increased and now includes the best workers in the Section. A considerable improvement was noticeable in regard to Portfolio "B," which was started last year and is intended to be a stepping-stone to the more advanced one.

In May, Mr. H. Nevil Smart, the Hon. Secretary of the Section, left England for some months to fill an appointment abroad. Mr. E. Staniland Pugh consented to act as Secretary during his absence.

The following meetings were held during the year. In arranging the course of lectures and demonstrations, careful attention was given to the inclusion of suitable subjects to appeal alike to the advanced and elementary worker.

Wed. Jan 23.—Demonstration on Enlarging by Mr. O. C. Quekett.
Wed. Feb. 6.—Landscape Photography in Buckinghamshire, by Mr. P. H. Williams.
Wed. 20.—Annual Lantern Slide Competition.
Wed. Mar. 6.—Further Hints on Flower Work and Lantern Slide Making, by Mr. Edward Seymour.
Wed. 20.—Holiday Papers.
1. Norway (slides by Mr. H. B. Curwen), Mr. H. J. Melliss.
2. Saxon Churches in Northamptonshire, Mr. R. W. Wylie.
3. Fourteen days on a First Class Battleship, Mr. H. Nevil Smart.

Wed. Apr 10.—Principles of Composition, Mr. W. E. Tindall.
Wed. 24.—Motive and Sentiment, Mr. E. O. Hoppé.
Sat. May 25.—Outing to Burnham Beeches.
Wed. Nov. 6.—Holiday Papers
1. Athens and the Pyramids, Mr. R. W. Wylie.
2. A Winter Holiday in Switzerland, Mr. J. B. King.

Wed. 20.—Demonstration on Oil Painting, Mr. Bertram Park.
Wed, Dec. 4.—
Thurs. 5.— } Annual Exhibition.

## RULES OF THE SOCIETY.

Copies of the Rules may be obtained on application to the Honorary Secretaries, 12, Heath Mansions, Heath Street, N.W.

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## BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

### Conference of Delegates of Corresponding Societies at Leicester.

*Report to the Hampstead Scientific Society of its Delegate.*

The Conference of Delegates held two meetings at Leicester on August 1st and 6th, during the visit of the Association, at both of which your Delegate was present.

Mr. H. J. Mackinder, the chairman of the Conference, presided over the first meeting. In his address he urged the desirability of local societies undertaking geographical research in their particular districts. As an example of the kind of work he proposed, he instanced the study of the distribution of plant association, the mapping of the area into moorland, woodland, etc., and the indication of the position of such associations as are characteristic of heather moors, swamps, natural pastures, oakwoods, &c., with records of the species found with each. The distribution of plant association should be interpreted by, and correlated with, the physical features. The whole would then form a study of the distribution of species from a geographical standpoint. Such work is carried out in France by local Geographical Societies, and in Germany by professors and students of Geographical Institutes. It is to be feared that such a scheme of work would be too ambitious for the Natural History students of our Society to undertake at present, but it is well to have a high ideal put before them.

The Rev. R. Ashington Bullen, after referring to the paper of last year by Mr. W. Jerome Harrison on the "Desirability of Promoting County Photographic Surveys," advocated the appointment of a Committee for the Photographic Survey of Ancient Remains in the British Islands, thereby placing on permanent record objects whose existence is threatened. It was pointed out by Mr. H. S. Kingford that a Committee had been appointed by Section H. (Anthropology) with a similar object in view. After discussion,

a resolution was passed, to be submitted to the Committee of Recommendations for transmission to the Council of the Association, with a view to obtaining information and giving advice for the execution of a Photographic Survey. It would appear that valuable work could be done by the co-operation of our Photographic and Natural History Sections in such work.

The second meeting was presided over by the Rev. J. O. Bevan, Vice-chairman.

Mr. Carleton Rea urged the attention of local societies to the investigation of the Fungi of their districts, a subject which has been neglected, and which, in addition to its scientific interest, is of great economic importance.

Your Delegate announced that, as a result of Dr. H. R. Mill's suggestion at the Conference of last year, this Society had asked the London County Council for a site on the summit of Hampstead Hill for the establishment of a Meteorological Station, and that the Council had granted the use of a site. When making this announcement, he was unaware that such opposition would be shown by the public to the use of public ground for a public purpose that the London County Council would afterwards withdraw its sanction, as it has since done.

C. O. Bartrum.

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## SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

### Congress at Woolwich.

*Report to the Council of the Hampstead Scientific Society of its Delegate at the Congress.*

The twelfth Annual Congress was held at Woolwich on June 12th, 13th, 14th and 15th. Delegates from twenty-six Societies were present, including the Secretary of the Natural History Section.

The President of the Congress was Prof. Silvanus P. Thompson, F.R.S., one of our Vice-Presidents, whose address on the fallacy of the proverb "Let the Cobbler stick to his Last," was delivered at the first evening meeting. In his address he showed how many important scientific discoveries had been made by amateurs, who had pursued various branches of science as a recreation from their "last," and instanced Wimshurst, Sturgeon, Herschel, Goethe, and many others.

Some of our members attended the congress as associates or

members of other affiliated Societies, and your delegate was the only representative of our Society present, others having been unable to attend.

The meeting of the General Committee and Delegates was held on Thursday. Speaking on the revision of Rule 5, your Delegate proposed that Hertford and Essex should be included in the counties covered by the Union. This was seconded by Mr. J. W. Tutt, F.E.S., editor to the Union, and will be considered at the next Congress.

The Congress of 1908 will be held at Hastings on June 10th, 11th, 12th, and 13th, under the presidency of Sir Archibald Geikie, F.R.S. Those members of our Society who may be able, are urged to attend; the great interest and educational value of these meetings will amply repay them for the time thus occupied. There is a nominal fee of three shillings to cover expenses. Fully illustrated reports of the previous Congresses can be seen on application to the Natural History Secretary.

The Autumn Meeting of the Union was held on December 7th, in the rooms of the Royal Society. The President for the year addressed the meeting on the Foundation and History of the Royal Society. Four of our members were present and availed themselves of the opportunity for conversation with those of the other affiliated Societies.

HUGH FINDON.

# List of Members.

***Corrected to March 6th, 1908.***

**Members are particularly requested to notify any change of address to the Hon. Secretaries of the Society, 12, Heath Mansions, Heath St., Hampstead, N.W.**

## Honorary Members.

| | |
|---|---|
| Bushe-Fox, J. P. .. .. .. | Ben Lomond House, Downshire Hill, N.W. |
| Dawkins, Prof. W. Boyd, M.A., D.Sc., F.R.S. | Owen's College, Manchester |
| Heberden. Colonel Henry, R.A., J.P., | 28, Buckland Crescent, Hampstead |
| Jermyn, F. Lubbock .. .. | Danny Corner, Hurstpierpoint |
| Martin, Basil, W., F.Z.S. .. .. | Aberdeen University |
| Womack, Frederick, M.B., B.Sc. (Member of Council) | 115, Alexandra Road |

## Ordinary Members.

| | |
|---|---|
| Abbott, Rev. E. A., D.D. .. | Well Side, Well Walk |
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| Acworth, J. J., Ph.D., F.I.C., F.C.S. | Thornbank, Shoot-up-Hill, Brondesbury |
| Alcock, S. P. .. .. .. | 5, Rudall Crescent |
| Allcock, Miss N. .. .. .. | 20, Shirlock Road, Gospel Oak |
| Allen, A. Jukes .. .. .. | 17, Well Walk |
| Apps, J. L. B. .. .. .. | 44, Maitland Park Road |
| Argyle, Jesse .. .. .. | Express Office, High Street |
| Ashworth, Percy H. .. .. | 30, Heath Hurst Road |
| Atkin, Geo. Duckworth .. .. | 9, Lindfield Gardens |
| Atkinson, B. E. .. .. .. | 14, Rosslyn Hill |
| Atkinson, Robert .. .. .. | 14, Rosslyn Hill |
| Aubrey, Hampton J. .. .. | 3, Fawley Road, West Hampstead |
| Avenell, George .. .. .. | Rose Lodge, Well Walk |
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| Baily, Walter, M.A., F.Z.S. (Vice-President) | 4, Rosslyn Hill |
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| Bakewell, H. J. .. .. .. | 60, South Hill Park |
| Barham, Sir George, J.P. (Vice-President) | 112, Haverstock Hill |

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Bird, Miss Alice .. .. .. 6, Windmill Hill
Blair, Alec Hood .. .. .. Wygtoun, Crediton Road
Blyth, C. F. T. .. .. .. 22, Tanza Road
Blyth, E. K. .. .. .. 6, Rosslyn Hill
Blyth, Miss E. T. .. .. .. 6, Rosslyn Hill
Boyce, Mrs. Louis E. .. .. Grasmere, Dollis Park, Finchley
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Chapman, Mrs. A. C. .. .. 38, Primrose Hill Road
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Crawshay-Williams, Leslie .. .. 73, Boundary Road

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de Vesian, Roland Ellis .. .. 6, Gayton Crescent
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Drummond, Mrs. .. .. .. 12, Worsley Road
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Dyer, Mrs. .. .. .. .. 15, Lindfield Gardens

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Fluck, A. W. .. .. .. 54, Brookfield, Highgate
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Frood, Miss D. .. .. .. 3, Gayton Crescent

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Grundy, Edmund F. .. .. .. 14, Thurlow Road
Grundy, Mrs. E. F. .. .. .. 14, Thurlow Road

Hallowes, V.B. .. .. .. Heath Fern Lodge, Heath Side
HARBEN, SIR HENRY, J.P... .. Seaford Lodge, Fellows Road
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(Member of Council)
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Holmes, Morell F. .. .. .. 59, South Hill Park
Holtzapffel, Miss .. .. .. Terrace Lodge
Homfray, Mrs. G. .. .. .. 16, Church Row
Homfray, Miss .. .. .. 16, Church Row
Hopkins, A. E. .. .. .. 9, Howitt Road
Hopson, Montagu F., F.L.S., F.E.S. 30, Thurlow Road
Hopson, Mrs. .. .. .. 30, Thurlow Road
Hunter, J. W. .. .. .. 41, Lancaster Road, S. Hampstead
Hutchinson, Rev. H. N., B.A., 17, St. John's Wood Park, N.W.
F.R.G.S., F.G.S.

James, Leonard, M.A. .. .. 8, Lyndhurst Road
James, Mrs. .. .. .. .. 8, Lyndhurst Road
Jealous, Mrs. .. .. .. 95, Fitzjohn's Avenue.
Jessop, Edward, M.R.C.S., L.R.C.P., 81, Fitzjohn's Avenue
Johnston, Mrs. Charles .. .. 72, Fitzjohn's Avenue
Jones, A. Denman .. .. .. St. Aubyn's, The Vale
Jones, George Edward .. .. 70, Belsize Park Gardens
Jones, V. Vaughan .. .. 9, Well Walk
Jones, Miss H. Vaughan .. .. 9, Well Walk

Kearne, Miss .. .. .. 1, Lyndhurst Gardens
Kinder, Miss M. A. .. .. 44, Willow Road

King, J. B. .. .. .. 2, Briardale Gardens, Platt's Lane
King, Mrs. M. L. .. .. .. 18, Lyndhurst Road
Knowles, C. Heygate, L.D.S.Eng... 13, Lyndhurst Road

Law, J. A. .. .. .. .. 12, Frognal Mansions
Law, Mrs. .. .. .. .. 12, Frognal Mansions
Le Grand, J. Prowett .. .. 5, Downside Crescent
Lister, Miss .. .. .. .. Upper Heath
Lovell, Miss M. A. .. .. Belsize Lodge, Belsize Lane
Lown, H. F. .. .. .. 31, Aberdare Gardens

Malcolm, W. F. .. .. .. Birnan House, Fitzjohn's Avenue
Mallam, W. A., M.R.C.S., L.R.C.P., 63, Rosslyn Hill
Marker, A. H. .. .. .. 11, Heath Drive
Marks, K. I., F.R.M.S. .. .. 4, Woodchurch Road
Marnham, Herbert .. .. Heathside, North End
Martelli, Miss Agnes .. .. 6, Prince Arthur Road
Martin, Miss F. .. .. .. 3, Foley Avenue
Mason, Miss Ella .. .. .. 8, Priory Road, West Hampstead
Melliss, H. J., B.A. .. .. 16, Hollycroft Avenue
Messenger, H. W., L.D.S. .. 47, Rosslyn Hill
Millar, Henry E. .. .. .. Heathdown, East Heath Road
Milne, F. G. .. .. .. 75, South Hill Park
Money, C. J. .. .. .. Greenhill Flats, Perrins Court
Moore, Miss M. E. .. .. 50, Willow Road
Mullard, Jos. A. .. .. .. 41, Heath Hurst Road
Muller, Hans .. .. .. 13, Thurlow Road
Murdoch, G. H. .. .. .. 49, Parliament Hill Road
Murray, T. .. .. .. .. 57, Nassington Road
Myring, Jacob .. .. .. Hatherley House, Ennerdale Road, Kew Gardens

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Nevill, Miss .. .. .. 17, Belsize Crescent
Nicolson, Alexander M. .. .. Bankside, Christ Church Road
Norrie, C. M., B.Sc. .. .. 14, Maitland Park Villas

Organ, Miss Winifred C. .. .. 60, Dale Road, Gospel Oak

Pace, Harry .. .. .. 21, Constantine Road
Page, Reginald W. .. .. .. 31, Buckingham Mansions

Palmer, J. E. .. .. .. 32, Willow Road
Paine, F. E. .. .. .. Hillfield, Haverstock Hill
Park, Mrs. .. .. .. .. 92, Fellows Road
Park, B. C. P. .. .. .. 92, Fellows Road
Park, D. F., F.Z.S. .. .. 77a, Belsize Park Gardens
Parker, Miss C. M. .. .. .. "The Wych," John Street
PAYNE, E. S. .. .. .. 45, Rosslyn Hill
(Member of Council)
Pearce, Robert, M.P. .. .. Beechcroft, East Heath Road
Pearce, Mrs. .. .. .. Beechcroft, East Heath Road
Pearce, Miss .. .. .. Beechcroft, East Heath Road
Pearse, D. Colbron .. .. 14, Willow Road
PETRIE, Prof. W. M. FLINDERS, 8, Well Road
D.C.L., LL.D., Ph.D., F.R.S.
(Vice-President)
Petrie, Mrs. Flinders .. .. 8, Well Road
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Pidgeon-Fletcher, G. J. .. .. 2, Manstone Road, Cricklewood
Player, J. H. .. .. .. 16, Prince Arthur Road
Plowman, H., F.S.A. .. .. 23, Steele's Road
Prance, R. H. .. .. .. 29, Netherhall Gardens
PUGH, E. STANILAND .. .. 31, Belsize Road
(Photographic Secretary *pro tem.*)
Purry, Walter .. .. .. 44, Well Walk
Purry, Mrs. .. .. .. 44, Well Walk

Quekett, O. C. .. .. .. 70, Greencroft Gardens

Radcliffe, Henry .. .. .. 18, Tanza Road
Radford, Maitland .. .. .. 1, Portland Villas, East Heath Road
Raisin, H. W. .. .. .. } Hawk's Nest, Stanhope Avenue,
Raisin, W. F. .. .. .. } Church End, Finchley
Randall, T. Gurney .. .. 40, Englands Lane
Rayner, Henry, M.D. .. .. Upper Terrace House
Reed, Miss Elsie .. .. .. Earlsmead, Hampstead Heath
Ridges, Miss Marian .. .. "Aberdeen," South End Road
Ridley, Miss J. .. .. .. 31, Daleham Gardens
Robins, P. S. .. .. .. 20, Greencroft Gardens
Roger-Smith, Hugh R., M.D. .. 1, College Terrace
Rowney, W. G. .. .. .. 2, Oakhill Park
RUDLER, F. W., I.S.O., F.G.S. .. 18, St. George's Rd., Kilburn, N.W.
(Member of Council)

Russell, Chas. A., K.C. .. .. 53, Netherhall Gardens
Russell, Mrs. .. .. .. 53, Netherhall Gardens

Sanders, C. G. .. .. .. 23, Ferncroft Avenue
Sanders, Mrs. C. G. .. .. .. 23, Ferncroft Avenue
Sanders, George .. .. .. 13, Briardale Gardens
Sanders, Mrs. George .. .. 13, Briardale Gardens
SCHRÖDER, WALTER .. .. Telegraph Hill, West Heath
(Member of Council)
Scull, Miss E. M. L. .. .. St. Edmund's, Worsley Road
Shackleton, Miss M. H. .. .. 20, Belsize Crescent
Sharman, Henry, M.D. .. .. Sedgemoor, Arkwright Road
SHENTON, E. W. H., M.R.C.S., 7, Heath Mansions, The Grove
L.R.C.P. (Member of Council)
Shenton, Mrs. E. W. H. .. .. 7, Heath Mansions, The Grove
Sibson, A. E. .. .. .. 19, Carlingford Road
Sievers, C. .. .. .. .. 8, Kingdon Road, West End Lane
Sloper, G. Randall .. .. 24, Lymington Road
Small, C. P. .. .. .. 28, Church Row
Smart, H. A. .. .. .. 40, Compayne Gardens
SMART, H. NEVIL (Photographic 40, Compayne Gardens
Secretary)
Steinberg, Miss Alice .. .. 54, Fellows Road
Steinberg, Miss C. F. .. .. 54, Fellows Road
Stevenson, E. H. .. .. .. 43, Redington Road
Stevenson, Miss M. H. .. .. 43, Redington Road
STOKES, A. W., F.C.S., F.I.C. .. 60, Park Hill Road
(Member of Council)
Stokes, Mrs. .. .. .. 60, Park Hill Road
Stopes, Miss Marie C., D.Sc., Ph.D. 53, Stanley Gardens
Strange, R. Gordon, M.S., M.B. .. 2, Belsize Avenue
Strange, Miss .. .. .. 2, Belsize Avenue
Such, Henry .. .. .. .. 2, Manor Mansions, Belsize Park
Gardens
Suiter, Miss M. .. .. .. "The Wych," John Street

Taylor, E. Claude, M.D., F.R.C.S., Eland House, Rosslyn Hill
M.S.
Taylor, Dr. G. F. Noel, L.R.C.P., 128, Mansfield Road
L.R.C.S.E.
TEBB, A. E., M.D., B.S., D.P.H. .. 226, Finchley Road.
(Member of Council)
Tebb, Mrs. A. E. .. .. .. 226, Finchley Road.

Thies, Conrad W. .. .. .. 37, Canfield Gardens
Thomas, Mrs. George, B.Sc. .. 137, Haverstock Hill
Thompson, A. Hugh, M.A., M.D... 26, Ellerdale Road
Thompson, Mrs. .. .. .. 26, Ellerdale Road
Thompson, Miss J. A. .. .. 2, Narcissus Road
THOMPSON, Prof. SILVANUS, P., D.Sc., F.R.S. (Vice-President) Morland, Chislett Road, West Hampstead
Thorn, Miss M. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thorn, Miss R. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thrower, Alfred .. .. .. 124, Haverstock Hill
Tiver, Ernest .. .. .. 8, Christchurch Place
Trefzger, H. .. .. .. 24, St. Mary Axe, E.C.
Turck, Miss Eliza .. .. .. 7, St. George's Square, Primrose Hill
Turner, G. H. .. .. .. 35, Rosslyn Hill

Underdown, Herbert W. .. .. 22, Belsize Crescent

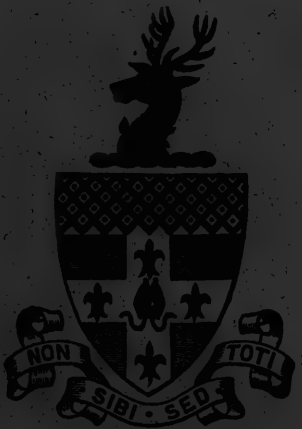
Viner, Miss F. A. .. .. .. 15, Thurlow Road
VIZARD, P. E., F.R.A.S. (Vice-President and Astronomical Secretary) .. Belsize Lodge, Belsize Lane
Vizard, W. G. .. .. .. 17, South Hill Park.

Wade, L. A. .. .. .. 99, Broadhurst Gardens
Waghorn, John .. .. .. 11, Arkwright Road
Waghorn, Mrs. J. .. .. 11, Arkwright Road
Waghorn, Miss .. .. .. 11, Arkwright Road
Wainwright, Shirley .. .. Elm Lodge, Elm Row
Wallis, Ernest .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. Ernest .. .. Lested Lodge, Well Walk
Watson, Miss H. M. .. .. 12, Canterbury Mansions, Lymington Road
Watts, P. A. .. .. .. 49, Goldhurst Terrace
Weber, F.O. .. .. .. 44, Stanley Gardens
Wells, Josiah .. .. .. 1, Arkwright Road
White, Miss Ellen .. .. .. 2, Rosslyn Mansions, Goldhurst Terrace
Whiting, James E. .. .. .. South End Road
Wight, George P. .. .. .. 29, Nassington Road, N.W.
WILKS, Sir SAMUEL, Bart., M.D., LL.D., F.R.S. (President) 8, Prince Arthur Road

Wilks, William .. .. .. 19, Denning Road
Wilks, Mrs. .. .. .. .. 19, Denning Road
WILLIAMS, J. W., M.R.C.S., L.R.C.P., F.L.S., F.R.M.S. (Member of Council) 128, Mansfield Road
Williams, Mme. Lottie .. .. 38, Rosslyn Hill
Williams, Philip H., A.C.A. .. 41, Downshire Hill
Woolf, M. Yeatman, F.E.S. .. 46, St. John's Wood Park
Woolf, Mrs. Yeatman .. .. 46, St. John's Wood Park
Wright, Miss Elizma .. .. 17, Stanley Gardens, N.W.
WYLIE, R. W., M.A. (Honorary Secretary of the Society) 44, Avenue Road, Highgate, N.
Wylie, Mrs. R. W. .. .. 44, Avenue Road, Highgate, N.

Yearsley, P. Macleod, F.R.C.S. F.Z.S. 31, Harley Street, W.
Yeld, Miss M. .. .. .. 29, Platts Lane

# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY.






1908.

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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With a List of the Members.

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*For the Year* 1908.

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PRICE THREEPENCE.

Published by the Society,
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HAMPSTEAD, N.W.
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IMPR. BARNARD & Cie
PARIS

THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

A General Meeting of the Society is held on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 precisely. Meetings of the Astronomical Section take place from time to time as they can be arranged. The Natural History Section meets on the second Friday in each month, and the Photographic Section twice a month.

The first General Meeting takes the form of a Conversazione at the Town Hall. All other meetings are held at the Hampstead Subscription Library, Prince Arthur Road.

During the summer months Out-door Meetings are organised.

The Society is about to establish, on the Reservoir at the summit of Hampstead hill, an Astronomical Observatory and a Meteorological Station.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

Copies of the last Report and Proceedings, with a List of the Members, can be obtained from the Hon. Secretaries, price 4d. each, post free.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned.**

C. O. BARTRUM,
R. W. WYLIE, } *Hon. Secretaries of the Society,*
12, Heath Mansions, Heath Street,
Hampstead, N.W

*February*, 1909.

# Hampstead Scientific Society.

## *List of Officers for the Year 1909,*

Elected at the Annual Meeting, February 5th, 1909.

**President.**

SIR SAMUEL WILKS, Bart., M.D., LL.D., F.R.S.

**Vice-Presidents.**

WALTER BAILY, M.A.*
SIR GEORGE BARHAM, J.P.
Mrs. SOPHIE BRYANT, D.Sc.
Prof. F. Y. EDGEWORTH, M.A., D.C.L.
Sir HENRY HARBEN, J.P.
Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.
F. W. RUDLER, I.S.O., F.G.S.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*.)

GEO. H. COTTAM, M.I.E.E.
C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS.
MONTAGU F. HOPSON, F.L.S., F.E.S.
J. E. PALMER.
E. S. PAYNE.*
HUGH R. ROGER-SMITH, M.D.
WALTER SCHRÖDER.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.
F. WOMACK, M.B., B.Sc.

**Hon. Secretaries.***

C. O. BARTRUM, B.Sc.
12, Heath Mansions,
Heath Street,
Hampstead, N.W.

R. W. WYLIE, M.A.
44, Avenue Road,
Highgate, N.

**Hon. Treasurer.***

E. COMPSON CRUMP,
L. & S.W. Bank, Ltd., High Street, Hampstead.

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**ASTRONOMICAL SECTION:**

Hon. Secretary.*
P. E. VIZARD, F.R.A.S.
Belsize Lodge, Belsize Lane,
Hampstead.

**PHOTOGRAPHIC SECTION:**

Hon. Secretary*
H. NEVIL SMART.
40, Compayne Gardens,
West Hampstead.

**NATURAL HISTORY SECTION:**

Hon. Secretary.*
HUGH FINDON, F.L.S.
58, Carleton Road, Tufnell Park, N.

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* *Executive Committee.*

# Report of the Council,

## For the Year 1908.

*Read at the Annual Meeting, February 5th, 1909.*

The Council has much pleasure in reporting that the work of the Society has proceeded satisfactorily during the past year. The new members elected during the year have numbered 40, which is the largest number that has joined in one year since 1904. The membership now stands at 273. Though the membership is 13 less than a year ago, at no time since the Society was founded have its activities been so great or so varied.

The members will be glad to know that their revered President, Sir Samuel Wilks, is now in the enjoyment of excellent general health. As, however, he is unable to leave his house in the evening, he cannot take an active part at the meetings as formerly.

Mr. F. W. Rudler, who for so many years has taken such a kindly interest in and has done so much for the Society, has left Hampstead. He has allowed the Council to recommend him for election as a Vice-President. It is satisfactory to know that his connection with the Society has not been broken.

Twenty-five ordinary meetings, general and sectional, have been held during the year, in addition to five field meetings, a photographic summer meeting, a meeting at the Museum of the Royal College of Surgeons, and one of a course of juvenile lectures.

The Annual Conversazione at the Town Hall, when Professor Silvanus P. Thompson, F.R.S., gave a lecture on the Scientific Work of Lord Kelvin, was largely attended, and proved a great success as usual.

The Council regrets that the attendance at the General Meetings has not been so good as would have been expected, considering the excellence and interest of the lectures and the scientific standing of the lecturers.

A class for the systematic study of the elements of Astronomy has been arranged by Mr. Vizard, which meets on alternate Tuesdays.

Under the energetic secretaryship of Mr. Findon the Natural History Section has made progress, and the number of members who take an active part in the meetings has increased.

The Photographic Section continues to prosper. Thanks are due to Mr. E. Staniland Pugh for his able conduct of the work during the absence of Mr. H. Nevil Smart. The latter has now been restored to the secretaryship with energy unimpaired. The excellence of the work done by the Section is proved by the merit shown at the Annual Exhibitions.

The proceedings at the General and Sectional Meetings will be found on pages 10 to 27.

For the first time a field meeting was held each month throughout the vacation. It is to be hoped that these meetings will be appreciated in order that the considerable expense involved may be justified. Particulars of these are printed on page 25.

A course of three lectures for Juveniles has been arranged by Mr. Vizard during the past Christmas holidays, and has proved a great success. (See page 26).

At the meeting of the British Association held this year at Dublin (September 2nd—9th), Mr. C. O. Bartrum represented the Society as Delegate to the Conference of Corresponding Societies. His report of the Conference will be found on page 28.

The Annual Congress of the South Eastern Union of Scientific Societies was held at Hastings (June 10th—13th), under the presidency of Sir Archibald Geikie, K.C.B., F.R.S. Mr. Hugh Findon attended as Delegate of the Society. His report is to be found on page 29.

The old observatory house and telescope on the East Heath have been removed. Continuous efforts have been made during the past year to find a suitable site for the establishment of a small astronomical observatory and meteorological station. It is hoped in the course of a few weeks to submit a new scheme to the consideration of members.

A statement of the year's accounts will be found on pages 8 and 9. The income during the past year has been less, but by careful management the expenditure has been reduced *pari passu*, and the ordinary income and expenditure are about equal. It should be strongly emphasised that this result is due to the large amount of voluntary work done by the officers and the more active members. Thanks are due to those members who so generously subscribe more than the minimum.

# STATEMENT OF ACCOUNTS FOR 1908.

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1908 Subscriptions paid in 1907, brought forward ... ... ... ... | £5 | 14 | 6 |
| 1908 Subscriptions... ... ... ... | 68 | 2 | 6 |
| | 73 | 17 | 0 |
| 1907 Subscriptions paid in 1908... ... ... | 2 | 7 | 0 |
| 1906 ,, ,, ,, ... ... ... | 1 | 2 | 0 |
| 1905 ,, ,, ,, ... ... ... | 0 | 10 | 0 |
| | 77 | 16 | 0 |
| Conversazione Tickets ... ... ... ... | 2 | 9 | 0 |
| Total Receipts for 1908 ... ... ... | 80 | 5 | 0 |
| Balance brought forward from 1907 ... ... | 5 | 1 | 3 |
| | 85 | 6 | 3 |
| Deficit ... ... ... ... ... ... | 2 | 2 | 11 |
| | £87 | 9 | 2 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Printing and Stationery ... ... ... ... | 11 | 0 | 4 |
| Printing and Delivering Report ... ... | 8 | 19 | 9 |
| Rent of Town Hall ... ... ... ... | 4 | 14 | 6 |
| Rent of Stanfield House... ... ... ... | 12 | 7 | 0 |
| Advertisements ... ... ... ... ... | 9 | 7 | 0 |
| Photographic Section ... ... ... ... | 3 | 10 | 4 |
| Natural History Section... ... ... ... | 1 | 0 | 6 |
| Conversazione ... ... ... ... ... | 7 | 13 | 3 |
| Subscription to Royal Photographic Society... | 1 | 1 | 0 |
| Subscription to S.E. Union of Scientific Societies | 0 | 7 | 6 |
| S.E. Union Meeting ... ... ... ... | 1 | 7 | 9 |
| Field Meetings ... ... ... ... ... | 0 | 16 | 10 |
| Lecturers' Expenses ... ... ... ... | 2 | 17 | 6 |
| Postages ... ... ... ... ... ... | 9 | 15 | 6 |
| Clerical Assistance ... ... ... ... | 3 | 3 | 0 |
| Gas Company ... ... ... ... ... | 0 | 16 | 8 |
| Sundry Expenses, per Hon. Secretary ... | 1 | 16 | 7 |
| Ordinary Expenditure during 1908 ... | 80 | 15 | 0 |
| Taking down Observatory and Storage of Telescope ... ... ... ... ... | 6 | 14 | 2 |
| | £87 | 9 | 2 |

Subscriptions in hand for 1909 paid in 1908, £9 11s. 6d.

*Examined with vouchers and accounts, and found correct,* { E. S. PAYNE, WALTER SCHRÖDER

E. COMPSON CRUMP, *Hon. Treasurer.*
Hampstead, 15th January, 1909.

# EPITOME OF EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Natural History Section ... ... ... ... ... ... ... | 4 | 3 | 6 |
| Photographic Section ... ... ... ... ... ... ... | 9 | 6 | 4 |
| General Meetings ... ... ... ... ... ... ... ... | 7 | 19 | 9 |
| Conversazione ... ... ... ... ... ... ... ... | 13 | 11 | 3 |
| Juvenile Lectures (part only) ... ... ... ... ... ... | 0 | 6 | 6 |
| Report, Printing and Delivering... ... ... ... ... ... | 8 | 19 | 9 |
| S.E. Union Subscription ... ... ... ... ... ... ... | 0 | 7 | 6 |
| S.E. Union Meeting ... ... ... ... ... ... ... | 1 | 7 | 9 |
| Vacation Meetings... ... ... ... ... ... ... ... | 2 | 19 | 1 |
| Royal Photographic Society ... ... ... ... ... ... | 1 | 1 | 0 |
| Advertisements ... ... ... ... ... ... ... ... | 9 | 12 | 0 |
| Sundry General Purposes ... ... ... .. ... ... | 21 | 0 | 7 |
| | 80 | 15 | 0 |
| Observatory Removal ... ... ... ... ... ... ... | 6 | 14 | 2 |
| | £87 | 9 | 2 |

# Abstract of Proceedings,

1908.

## General Meetings.

Friday, January 3rd. Mr. Walter Baily, M.A., Vice-President, in the chair.

**Principal Reginald S. Clay, D.Sc.,** gave a holiday lecture on "**Soap Bubbles,**" illustrated with experiments. The lecturer explained that the free surface of water behaves as if a taut membrane were spread over it, always tending to reduce the area of the surface to the smallest dimensions. Force is required to enlarge this surface. This he showed in several ways. If a film of soap solution containing a loop of cotton thread be pricked within the loop, the latter instantly expands into a circle, this being the greatest area a given length of thread can enclose. The film outside the loop contracts to its greatest extent, leaving a circular hole where the film has been broken. And, again, a wire sieve, waxed so as to be incapable of being wetted, though full of holes, will hold a small quantity of water, the tension of the water surface, at each hole through which the water is endeavouring to pass, being sufficient to retain it. For a similar reason the iron sieve could be made to float on water. In the case of a bubble of soap solution the film, in its endeavour to contract as much as possible, compresses the enclosed air into a sphere, for a sphere is that figure which has the smallest surface with a given volume.

The lecturer also showed that, whereas a piece of rubber requires more force to stretch it the more it is stretched, this is not so with a soap film. The tension is the same, however large and however small. He blew a mass of bubbles between two glass plates in the lantern, and showed that, under all conditions of size of the bubbles, three films always meet at one point, never more nor less, and that the three films made equal angles with one another at this point. He showed the same principle with some wire frames, bent into simple geometrical figures—cube, pyramid, etc. On dipping these into soap solution a film was left on each side and films met in the inside. Whenever this was the case the

constancy of the glane at which they met was a proof of the constancy of the tension of the film.

The lecturer next dealt with the colours of soap bubbles. These are due to the extreme thinness of the film. From each surface, external and internal, light is reflected. Colours result from the interference between the two reflections. He reflected the light of the arc from a film formed in a ring of metal held vertically. The thickness is less at the top of the circle and continually decreases until the film breaks. As this progresses bands of vivid colour travel downwards until, just before rupture, a black spot appears at the top. At this black spot the extreme thinness is such that no reflection of light is possible, and the soap film is here invisible. This experiment is of great interest, as, by the measurement of the thickness at this black spot, the late Lord Kelvin determined an approximate value of the size of the molecules of which matter is composed. The thickness is here about one hundred thousand millionth of an inch.

Dr. Clay proceeded to give a demonstration of blowing bubbles inside one another. He succeeded in blowing a large bubble some fifteen inches across.

The last experiment of the evening consisted in the formation of a " big drop." An ordinary drop of water hanging from a water tap is held together and derives its figure from the surface tension of the water referred to at the beginning of the lecture. This " big drop," however, was enclosed by a film of rubber. Its shape was that of an ordinary drop, but hugely large. The lecturer emptied two pails of water into it before it finally burst.

On Friday, February 7th, the Annual General Meeting was held under the chairmanship of Mr. Walter Baily, M.A., Vice-President. The Report of the Council was read and adopted. The President, Vice-President, Officers and Council were elected.

The meeting was resolved into an ordinary meeting.

**Mr. P. Macleod Yearsley, F.R.C.S.,** gave a lecture on **" The Physiology of Hearing,"** illustrated with lantern slides. Hearing was believed to be a development of the sense of touch. With the aid of lantern photographs and diagrams, the anatomy of the ear was first described. The external ear, or pinna, now nearly or quite incapable of movement, and apparently of little or no use as an aid to hearing, has been evolved from the pointed movable ear of the lower animals. A drawing of the pointed ear of an ape was exhibited to show the changes that had taken place.

Attention was drawn to the folding over of the edge of the human ear, carrying with it the "tubercle of Darwin"—a small point which still persists with most persons as a vestige of the apex of the erect ear of the ape. The middle and internal ear are deeply embedded in the temporal bone of the skull, being thus protected from external violence. The passage from the outside leads directly to the tympanum or drum, which is caused to vibrate by the impact of the sound waves. The vibrations are conveyed from the drum by a chain of small bones or ossicles to a membrane covering an opening (*fenestra ovalis*) of the internal ear. The fluid in the bony labyrinth of the internal ear is thus in continual vibration in unison with the sounds of the external air. The Eustachian tube, leading from the throat to the middle ear, serves to keep the atmospheric pressure equal on the two sides of the drum. The sound one hears when one swallows is due to the opening of this tube. The most important organ of the internal ear is the cachlea, a spiral canal containing a watery fluid. Along this canal is stretched a membrane—the Basilar membrane—containing fibres, whose length increases from the base of the cochlea to the apex. In close association with these fibres are nerve fibrils, which convey the impulses to the brain.

Having described the anatomy of the ear, the lecturer proceeded to discuss the theories that have been advanced to explain the extraordinary power of the auditory sense of analyzing a sound into its component vibrations. Tones can be perceived varying from sixteen vibrations to 40,000 or 60,000 vibrations per second, and of these very small differences can be detected. Physiologists have been divided into two opposing camps, those who hold that this analysis takes place in the brain (the telephone theory), and those who maintain that it takes place in the cochlea (the piano theory). The former theory does not account for the complicated anatomy of the cochlea, nor for the gradually increasing lengths of the fibres of the basilar membrane. It seems to remove the question from scientific investigation rather than to offer an explanation. The brothers Charles and John Bell in 1816 first suggested, when the microscopic structure of the cochlea was unknown, that an organ capable of sympathetic resonance would be found, consisting perhaps of a series of strings like those of a piano, which could respond to tones of the same pitch as their own. Helmholtz, with whose name the piano theory is associated, considered that the fibres of the basilar membrane fulfil this function; that the longer fibres of the upper portion detect and respond to the low notes, and the shorter fibres below to the high notes. The

structure of this membrane shows much evidence in favour of this theory. Its fibres are taut and of gradually increasing length, whereas longitudinally the membrane is not under tension. Moreover Hemholtz's view that the high notes are perceived in the lower and low notes in the upper portion is supported by evidence from actual patients whose internal ears have been examined after death. Some difficulties in the acceptation of this theory of Hemholtz have lately been disposed of by Dr. Albert Gray, into which matter Mr. Yearsley entered at considerable length. Dr. Gray's modifications of the theory are based on the principle of maximum stimulation, and seem to account satisfactorily for the facts.

Friday, March, 6th, Mr. P. E. Vizard, Vice-President, in the chair.

**Dr. J. F. Spencer, D.Sc., Ph.D.,** gave a lecture on **"The Liquefaction of Gases."** The lecturer detailed the history of the science of liquefaction. In 1823, Faraday, at the request of Sir Humphry Davy, investigated the action of heat on chlorine hydrate. He succeeded in liquefying chlorine, sulphur, dioxide, sulphuretted hydrogen, carbonic acid gas, nitrous oxide (laughing gas), cyanogen, and ammonia, by liberating these gases in closed tubes, the pressure produced by their liberation in the enclosed space having been sufficient to condense them to the liquid state. Previous to this work of Faraday success had been claimed by Count Rumford and Babbage in the liquefaction of carbon dioxide, by Northmore of chlorine, and by Perkins of air; but later knowledge has shown that these supposed successes were very doubtful —indeed, in the case of air, quite impossible. In 1835 Thilorier produced a gallon of liquid carbonic acid gas by pouring vinegar on chalk in an iron vessel. On liberating the liquid from its confinement he reduced its temperature so rapidly by evaporation that the gas solidified in the form of snow. On one occasion the pressure in his producer caused its explosion, and resulted in the death of his assistant. Up to this time great danger had generally attended these investigators, who had worked in an atmosphere of flying fragments of apparatus.

Between 1861 and 1870 the work of Andrews threw light on the proper methods of liquefying gases. He showed that for each gas there is a temperature, named by him the "critical temperature," above which no amount of pressure will result in liquefaction, and that the so-called "permanent" gases required

a low temperature as well as pressure to reduce them. Acting on this principle, Cailletet, on Dec. 2nd, 1877, and Pictet a few days later, succeeded in liquefying oxygen by cooling it to a low temperature and applying some two hundred atmospheres of pressure. Olezewski and Wroblewski similarly liquefied oxygen, nitrogen, and finally hydrogen, in 1884.

About 1895 the method was revolutionized by the invention of the regenerative process. By this method no preliminary cooling is necessary, except in the case of hydrogen. The gas is pumped to a high pressure in a receiver. It is then liberated, expanding as it issues from its receiver and becoming lowered in temperature by expansion. The gas so cooled is made to cool that not yet expanded, the latter becoming thus further cooled. By this "regenerative" process a gas can be made to cool itself to a temperature approaching the absolute zero, and the most refractory gases have thereby been condensed to the liquid state at ordinary atmospheric pressure. They can be placed in open Dewar non-conducting vessels and used for investigation on the laboratory table.

The lecturer then made a series of experiments with liquid air. This liquid, which resembles water, and which he poured from one Dewar vessel to another, has a temperature of —187 deg. C. (about 300 deg. F. "of frost"). An object placed in it caused it to boil, as a red-hot iron in water. The moisture of the air around the vessel was precipitated as hoar frost. Fresh flowers placed in the liquid were frozen, so that they broke into dust in the hand; a soft rubber ball so frozen broke in fragments on the floor; mercury became solid, and could be bent like lead; alcohol and ether were frozen to solid white substances. Dr. Spencer showed experimentally that the colour of many substances tends to disappear at this low temperature. The tube conveying ordinary coal gas to a lighted jet was surrounded by liquid air. All the constituents of the gas were thereby condensed except the hydrogen, which alone passed to feed the flame. The luminous jet was thus reduced to a small blue jet of hydrogen.

Friday, April 3rd, Mr. Henry Clarke, J.P., in the chair.

**Dr. E. F. Bashford,** Director of the Imperial Cancer Research, gave a lecture on **Cancer,** its characteristics, its incidence, and the investigations that are being made by the Research. The lecturer expressed his regret at the inability of the President of the Society to be present that evening, as it was in 1847 that Sir

Samuel Wilks published his first paper in which reference was made to cancer, and since that day he had played a most distinguished part in the study of the subject. The disease was one for which, as yet, there had been found no certainly reliable treatment and no cure. Its importance was shown by the fact that, of those who reached the age of thirty-five, one of every eight women and one of every twelve men died of it. The lecturer was not prepared to say that the number of deaths was increasing. The disease showed no symptom except the presence and growth of a lump and caused no pain until the end was nearing, or some sensitive part became involved. It was thought till a few years ago that its incidence was confined to civilized man; but the investigations of the Imperial Cancer Research had shown that no race of the British Empire was exempt. The mode of life had been blamed; but this was hardly borne out by these investigations. The disease was found among all vertebrate animals, including birds, amphibians, and fishes. Much work in the study of the subject has been done in other countries; but progress had been coming to a standstill from want of a new method of attack. As experiment could not be performed on man, it became necessary to experiment on animals. Mice and rats were found to be the most convenient for the purpose. They were subjected to the pricks of the subcutaneous needle, and where the disease was successfully conveyed no disturbance of general health or pain or apparent inconvenience was caused until the last stage was reached. The animals were killed before this full development took place, or in case they appeared to be out of health, as they were then no longer of service. The investigations had shown that cancer could be conveyed by transplantation from one individual to another of the same species, but in no case of another or even an allied species. Many wild and vague statements were made from time to time of modes of treatment, and of cures that were thereby effected. As many as 350 so-called certain cures had been investigated. In all cases the truth of these had been disproved, and the charlatans who advertised them had been exposed. Certain forms of irritation of the tissue had been shown to be associated in some as yet unknown way with the incidence of cancer, the lecturer instancing the smoking of clay pipes, and the wearing of a particular form of basket by the natives of Cashmere.

Dr. Bashford then gave an account in some detail of the investigations that were being made on skin cancer. He showed by photomicrographs on the screen that the minute anatomy was similar in different animals—man, mouse, newt, frog, and fish—and

that only an expert could distinguish the first two. A secondary growth of the disease may occur in another part of the body by a process of natural transplantation from the primary, and such secondary growth appears to be actually encouraged by the presence of the primary. Experiments now being made appear almost certainly a secondary development. The treatment consists in the inoculation of an emulsion of the skin of an individaul of the same species. After such an inoculation the cancer cells of the incipient growth are unable to find the scaffolding of supporting tissues and blood vessels they need and they appear to be destroyed ultimately by a process allied to the phagocytosis of Metchnikoff. The lecturer was anxious, however, to disclaim that any treatment had yet been established, as the investigations had not been concluded. Contrary to what had hitherto been believed possible, the natural cure of cancer had been found to occur. It had been shown also that the surgeon's knife does not cause a greater malignancy in any subsequent growth. Up to the present the greatest relief and the most certain cure is to be obtained by surgery.

In reply to questions asked by members after the lecture, Dr. Bashford said that there was no sufficient evidence of the inheritance of cancer or of any influence of locality on its incidence. Infection from person to person was almost an impossibility, and might safely be disregarded. He also said that the announcement made by Farmer, Moore, and Walker that cancer cells showed a similarity with reproductive tissue in containing half the usual number of chromosomes, showing also the peculiar forms of ripening sexual cells, had not been confirmed by the investigations of the Imperial Cancer Research.

Friday, May 8th. Mr. F. W. Rudler, I.S.O., F.G.S., in the chair.

**Mr. W. Whitaker, B.A., F.R.S.,** late of the Geological Survey, gave a lecture entitled **"Geology and Photography."** With the aid of a series of slides he discoursed on many of the interesting features of the geology of the South-East of England. He gave special prominence to the Sandgate Landslip of 1893, showing the causes that led to its occurrence and, by a set of photographs, its striking effects upon the buildings and the surface of the ground. The landslip was confined to that portion of the cliff which was under private ownership, the War Office property under precisely similar geological conditions not suffering from the catastrophe. This was due to the fact that, under sound expert advice, the War Office authorities had drained their property.

On Friday, October 23rd, the Annual Conversazione was held to inaugurate the Session 1908-09. Mr. Walter Baily, Vice-President, and Mrs. Baily received the members and their friends.

**Professor Silvanus P. Thompson, D.Sc., F.R.S.** Vice-President, gave a lecture on **"Lord Kelvin's Scientific Work,"** illustrated with lantern slides. The subject, the lecturer said, was too vast to be treated adequately in the time at his disposal. Lord Kelvin for over sixty years continued to illuminate the broad fields of science he made his own. His life's work was sufficient to make a reputation three times over. In his early years he was a leader in pure physics; in middle life his work in the application of physical science brought him popular renown; while in later years, in matters dealing with the constitution of matter, of the ether and of electricity, he was an ackowledged master. It was impossible for a present day student, brought up in modes of thought largely moulded by him, to appreciate fully his influence. One naturally inquired into the origin of such a man and tried to learn, if possible, whether such genius was due to inheritance.

Lord Kelvin's father (James Thomson) was himself a remarkable man. Son of a small farmer in County Down, of Lowland Scottish descent, with few advantages but his innate love of learning and especially of mathematics, he became Professor of Mathematics at Glasgow. His son William (Lord Kelvin) received his early education entirely from his father. So well was this given and so apt the pupil that William Thomson matriculated at Glasgow University at the age of eleven. Lord Kelvin, then, never went to school. He at once made his mark in mathematics and physics. Though he maintained an interest in the classic authors to the end of his life, his bent was so strongly marked that his father sent him to Cambridge without having taken his degree at Glasgow. As an undergraduate of seventeen he revelled in abstruse mathematics, and at the end of his career at Cambridge came out Second Wrangler, being beaten by Parkinson, who had paid more attention than Thomson to the art of being examined. That studies did not occupy his whole attention was shown by the fact that he rowed for Cambridge in the University Race of 1844, and that he helped to found the Cambridge University Musical Society, which still exists. After a few months spent under Regnault in Paris he returned, at the age of twenty-one, a master of mathematical physics. In the following year he was appointed to the Chair of Natural Philosophy at Glasgow, a professorship he continued to hold for fifty-three years.

The early years of his professorship were times of fruitful strenuous work. With Joule he established the proposition that heat is a form of energy, and that heat and work are mutually convertible. On the basis laid by Carnot he applied his powerful mind to the principles of heat engines, determined the meaning of temperature as a measureable quantity and the principles of an absolute scale of temperature, found the absolute zero to be 273 degrees C, and formulated the two great laws of thermodynamics. Thus, by the time he was thirty years of age he had taken the leading part in the establishment of the principles governing energy and the transformation of energy of universal application.

From this time Thomson was drawn towards those practical applications of science, that gave him a second title to fame. His early interest in Fourier's equations dealing with the flow of heat through solids led him to the principles determining the flow of electricity along a cable, and to his taking an active part in solving the problems involved in the laying of the Atlantic Cable, for which he was knighted. He invented for this purpose the mirror galvanometer and the siphon recorder. Prof. Thomson showed by an experiment on the lecture table the sensitiveness of the former instrument. From a tiny battery made of a lady's thimble he passed a current through a resistance representing that of several Atlantic Cables, when the light from the mirror of the galvanometer instantly responded. About this time, he continued, Sir William Thomson (Lord Kelvin) was largely responsible for the adoption of the well-known electrical units—the ohm, volt, and farad—which have since become of universal usage. With Tait he wrote the celebrated " Treatise on Natural Philosophy." From Helmholtz's mathematical investigation on the properties of the vortex he was led to propound his vortex theory of atoms, according to which an atom of matter was to be considered a vortex in the ether. The lecturer illustrated this by producing vortex rings of smoke. Sir William Thomson spent fruitful years of research on magnetism, atmospheric electricity, and allied subjects. His fondness for yacthing and his skill as a navigator led to his improvements of the mariner's compass, which are now generally adopted ; to many improvements in sounding apparatus ; to his tide predicting machine, and his mechanical harmonic analyser. Very numerous were the instruments and appliances he devised for commercial use in electrical measurements. Lantern views of many of these instruments were shown on the screen.

In 1892 Sir William Thomson was made a peer, with the title Baron Kelvin, and in 1896 was celebrated at Glasgow his jubilee

as Professor of Natural Philosophy, when all nations and learned bodies sent representatives to do him honour. In later life, indeed, honours were showered upon him. He was President of the Royal Society; an original member of the Order of Merit; he held the Prussian Pour le Mérite, the French Legion of Honour; he was a Privy Councillor, Chancellor of his University, a member of every foreign Academy, and an honorary graduate of almost every University. Yet, withal, he was modest, simple, and lovable to an extreme degree, and anyone who was fortunate enough to enjoy his intimacy received an enhanced idea of the possibility of human nature. Though at the Leicester meeting of the British Association in 1907 he seemed to show his usual surprising activity of mind and body, in a few months he sank under the influence of a chill, and was buried in Westminster Abbey with national honours.

After the lecture, refreshments were served in the Small Hall. A collection of scientific exhibits were on view.

Friday, November 6th. Mr. P. E. Vizard, Vice-President, in the chair.

**Dr. F. Edridge-Green** gave a lecture on "**Colour-Blindness and Colour-Perception.**" The lecturer showed by coloured lantern slides the nature of the mistakes commonly made by colour-blind persons. There are two classes of colour-blind cases:—1. Those in which the colour spectrum is shortened at one or both ends; that is, in which light of extreme wave lengths, commonly visible, gives no impression at all upon the eye; and (2) those in which light perception is normal, but colour perception defective. Colour perception is a matter of degree, varying from those rare cases where only one colour is recognised to the normal case where six colours can be distinguished, viz., red, orange, yellow, green, blue, and violet. The indigo of Newton, though generally believed by most persons to be recognisable, is really only distinguished as separate colour by one person in several thousands. The common form of colour-blindness, the trichromic, in which red and green are confused, is the most important, as such persons are obviously unsuited to be railwaymen or seamen. Many persons are unaware of their defect, as was shown at this meeting by the fact that several members present found themselves incapable of passing the simple lantern tests which the lecturer applied. Much interest and some amusement were caused by the answers given by these members. In some cases, for instance, where a vivid green was shown by the lantern, the colour-blind person stated it to be red. By means

of lantern diagrams the theory of colour vision was explained by the lecturer. The methods used for testing for colour blindness are (1) the lantern test; (2) the classification test by means of coloured wools; and (3) the spectrum test. The wool method was declared by the lecturer to be unsatisfatcory, many normal sighted being thereby rejected, while intelligent colour-blind persons frequently fail to be detected.

Friday, December 4th. Dr. G. D. Pidcock in the chair.

**Mr. J. C. Maxwell Garnett, M.A.,** gave a lecture on "**The Birth of the Moon,**" in which the history of the moon was traced back to the time when it was thrown off the still fluid earth and forward to the time when it will again closely approach its parent planet.

After insisting upon the importance of the search for knowledge for its own sake, without hope of reward, and with no regard to its practical application, the lecturer gave some account of the true scientific method of investigation—the collecting of facts, the propounding of an hypothesis to explain these facts, the deducing of consequences, and the testing of the hypothesis. Striking instances of this method were supplied by Charles Darwin's theory of the evolution of species by natural selection, and by his son Sir George Darwin's theory of the evolution of the earth-moon system by the action of tides. The lecturer explained the formation of the two daily ocean tides by the action of the gravititional attraction of the moon upon the waters, and described how the main tidal waves, generated principally in the Pacific Ocean, become highly complex as they travel through seas and straits. A wave will travel more slowly in shallow than in deep water; indeed, nowhere is the ocean deep enough to allow the tidal wave to travel as fast as the earth rotates. Hence the tides are greatly delayed, the tide at London, for instance, having been generated in the Pacific two days before its arrival. The earth, rotating under the tidal waves, is subjected to friction, in consequence of which it is being slowly retarded and the day is being lengthened. An important deduction from Newton's laws of motion is that the total amount of spin or angular momentum of a system of bodies remains constant whatever be the interactions among these bodies. It follows then that, if the moon be checking the earth's spin, it must be increasing its own. This it is doing by increasing its distance from the earth. Sir George Darwin traced this process backward in time, and arrived by mathematical calculation at

some remarkable results. When the moon was near the earth it was making a revolution in three to five hours. When the moon was in this position the earth must have been rotating also in about three to five hours—a striking coincidence in itself, which pointed to the moon having parted from the earth when she was molten and rotating at this rapid rate. Calculations in other directions resulted, however, in further coincidences. It was found that the critical speed of rotation of a molten body the size and mass of the earth, at which it would be likely to fly to pieces, was somewhere between three and five hours. Then, again, tides would be formed in this molten earth by the sun, distorting it twice in each revolution; but the natural period of vibration of such a body was found to be about two hours. The solar tides therefore were acting as a carefully timed impulse would act on a free pendulum, and were assisting the tendency to fly to pieces. The following, then, can be said to have been the history of the earth and moon. As the earth cooled and contracted its velocity of rotation increased until it became instable and a portion separated. The day and month were then equal and of about three to five hours long. By tidal action of the infant moon on the earth the day was lengthened, the moon travelled away, and the month became as it is at present. At least 90,000,000 years (and probably much more) must have been occupied in this process. This will go on until the day and month are again equal, and of about fifty-five of our present days in length. After this solar tides will further lengthen the day and the moon will again approach the earth, a condition of things that seems to obtain at present with Mars and his satellite. The lecturer gave reasons for thinking that in the case of no other planet of our system had the same process of formation of moons been followed.

# Natural History Section.

The average attendance at the meetings of this Section was slightly larger than in the previous year. There was also a notable increase in number of exhibits shown. The Secretary notes with satisfaction the increasing interest members have manifested in contributing to the programme of the meetings.

The Society's entomological cabinet has been cleared and disinfected. Members are reminded that the representative collection of local moths and butterflies is to be commenced this current year.

Seven meetings were held in 1908 at Stanfield House as follows :—

Friday, January 10th. Mr. C. O. Bartrum, B.Sc., General Secretary, in the chair.

Mr. Geo. P. Wight exhibited Ferns, collected by the expedition to Misiones in 1894, and photographs of the Forest Growth and River Falls of that district.

Mr. Herbert Goodchild, M.B.O.U., exhibited the skins of a Humming Bird and some allied species from South America, and of two British Goldfinches.

Mr. K. I. Marks, F.R.M.S. exhibited under his microscope *Synchaeta pectinata.*

**Professor F. Y. Edgeworth M.A., D.C.L.,** read a paper on **"Further Observations on Bees and Wasps."** He first gave data obtained by the then Sir John Lubbock on the time taken by wasps to load honey, which were corroborated by his own observations of wasps loading marmalade. He had also made investigations as to the time occupied in journeys from and to the nest, by two methods of calculation in which he ascertained that the journeys varied with outside conditions from thirteen to thirty-five minutes.

Friday, February 14th. Mr. P. E. Vizard, Vice-President, in the chair.

Mr. Montagu F. Hopson, F.L.S., F.E.S., exhibited a case of *Melitea aurinia* (the Marsh Fritillary).

Mrs. Champneys exhibited a Life History of *Bombyx vulpi* (the Fox Moth), also *Ascalphus italicus* from Switzerland, and a number of butterflies taken in Frognal.

**Mr. James A. Simes** read a paper on **"The Butterflies of Central and South Eastern Europe,"** with lantern illustration. During the summer in Switzerland, butterflies were

in great profusion. There was also a great range of species, embracing sub-tropical types in the lower valleys, and arctic forms about the line of snow. Many photographs of the insects in their natural environments were shown on the screen.

Mr. Simes also recounted his observations in Corfu and Southern Italy.

Friday, March 13th. Mr. P. E. Vizard, Vice-President, in the chair.

Mr. Herbert Goodchild, M.B.O.U., exhibited *Picus*, (woodpeckers), showing adaptation to their mode of life.

Mr. James E. Whiting exhibited two Hampstead birds, *Corvus monedula* (Jackdaw), and *Corvus corone* (Carrion Crow).

**Mr. F. C. Channing F.Z.S.,** read a paper on **"The Pineal Eye,"** illustrated by drawings. The Tuatara was the sole living representative of a distinct order of lizards (*Rhyncocephali*) which appeared in Permian times, and existed in Europe to the Cretaceous period. The creature had a rudimentary third eye, which was the remains of what was probably a working organ in its ancestors. The fossil skulls of Saurians had foramina as the Tuatara, and from their appearance it is probable the pineal eye was well developed.

In man the pineal gland is all that remains of a third eye.

**Mr. Hugh Findon F.L.S.,** read a paper on **"The Distribution of Some British Marine Mollusca,"** illustrated by lantern slides. Bivalve shellfish were alone considered and the conclusion was that they were mostly of Southern origin.

Friday, April 10th. Mr. P. E. Vizard, Vice-President, in the chair.

Mr. James E. Whiting exhibited an albino *Vespertilio pipistrellus* (the pipistrelle), and a normal *Plecotus auritus* (the long eared bat).

Mr. H. Pace exhibited three sheets of Botanical water colour drawings. Mr. Hugh Findon, F.L.S., exhibited specimens of the timber of British Trees.

**Mr. James E. Whiting** read a paper on **"Familiar Trees,"** with lantern illustration. Twenty species of common British trees were dealt with. Photographs of the leaves of these were shown on the screen, and also views of the growing trees.

Mr. Whiting also mentioned and showed views of the veteran trees of Sherwood and elsewhere.

Friday, May 15th. Mr. P. E. Vizard, Vice-President, in the chair.

This being the last meeting of the Session, tea and coffee were served at 7.30, and vocal and instrumental music was rendered during the evening by Mrs. Radclyffe, Miss Hallam and Mr. Morris.

The Rev. H. Neville Hutchinson, B.A., F.G.S., F.Z.S., and Mr. A. W. Stokes, F.C.S., F.I.C., exhibited objects under their microscopes.

Mr. H. Pace exhibited sheets of Botanical drawings and Mr. R. Ellis de Vesian, Plants of Hampstead collected twenty-six years previously.

**Mr. F W Rudler, I.S.O., F.G.S.,** gave a black board demonstration of **"The Structure of Precious Stones,"** and exhibited models of many famous gems. Mr. Hugh Findon, F.L.S., afterwards spoke on "The Land Mollusca of Britain," of which he showed a nearly complete collection of species.

Friday, November 13th. Mr. Walter Baily, M.A., F.Z.S., Vice-President, in the chair.

Mr. W. G. Snowden Gard, LL.B., exhibited two maps of Canada and explained the relation of the physical features to the geological formations.

Mr. James Burton exhibited under his microscope the scales of *Machilis maritima.*

The Secretary laid on the table a collection of Mosses, and two Botanical works, presented to the Society by Mrs. C. Beach.

Mr. Hugh Findon, F.L.S., exhibited a *Testacella haliotidea* from South Hampstead.

**Miss Garlick** gave a demonstration of **"The Structure of Plants,"** illustrated by sheets of coloured drawings lent by Mr. Pace. She explained those features in the structure of plants which enable a satisfactory botanical classification to be constructed.

Friday, December 11th. Mr. F. C. Channing, F.Z.S., in the chair.

The four members of the Section Committee were elected as follows : Mrs. Park, Mrs. P. L. Forbes, Mr. S. P. Alcock, Mr. H. Pace.

Mr James Burton exhibited under his microscope living *Vorticella* and *Rotifer.*

**Mr. D. J. Scourfield, F.Z.S., F.R.M.S.,** gave a lecture on **"Locomotion in Minute Aquatic Organisms."** The *Amœba* moved by the extension of its substance in various directions. *Euglena* and *Peridinia* depended for locomotion on a whiplike organ—the "flagellum," *Rotifer* and *Vorticella* on numerous very fine hairlike organs—"cilia." Various small worms and larvæ progress by throwing the whole body into "figure of eight" motions *Salpa* projected itself by expelling water from the end of its body. *Entomostraca* had specialized organs actuated by muscles to swim with.

*Desmids*, *Diatoms* and *Oscillatoriæ* moved in an imperfectly understood manner which called for further investigation.

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## Vacation Meetings.

Meetings have been held each month during the vacation of 1908.

Saturday, May 23rd.—Members met for a ramble in the neighbourhood of Chenies under the guidance of Mr. James E. Whiting.

Saturday, June 27th.—Taking train to Caterham, members walked to Merstham. A Field Lecture on the "Lower London Tertiaries" was delivered by Mr. F. W. Rudler, I.S.O., F.G.S., a pebble quarry above Caterham serving as a lecture theatre.

Saturday, July 18th.—Under the guidance of Mr. Hugh Findon, members proceeded to North Weald Station and walked by woodland and field paths to Epping Plain, returning from Epping station.

Saturday, August 15th.—By the request of members an additional excursion was arranged. The party visited Purfleet quarries, and walking to West Thurrock, they, at the invitation of the Vicar, joined the Morley Archæological Society in listening to a discourse by the reverend gentleman on "Dene Holes."

Saturday, September 26th.—Members took train to Northwood, and, conducted by Mr. S. P. Alcock, walked across the fields to Harefield. The Vicar of Harefield and Mr. H. Plowman, F.S.A., addressed the party on the antiquities of the village. The return was by the canal path to Rickmansworth.

Saturday, October 3rd.—A meeting was held in the museum of the Royal College of Surgeons. Mr. R. H. Burne gave a discourse on comparative anatomy as illustrated by that portion of the collection devoted to the skin and sense organs.

## Christmas Juvenile Lectures.

Wednesday, December 30th, 1908, at 5 p.m., "Ghosts, Ancient and Modern." Mr. A. W. Stokes, F.C.S., F.I.C.

Wednesday, January 6th, 1909, "Volcanoes and Earthquakes." Mr. R. W. Wylie, M.A.

Wednesday, January 13th, 1909, "The Story of Babylon and Assyria." Mr. C. Simmons, M.A.

These lectures, which were illustrated with the lantern, were free to Members' children, other children being admitted on payment of 6d. each.

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## Photographic Section.

COMMITTEE FOR 1908.

Miss Homfray, H. B. Curwen, A. Denman Jones, E. Staniland Pugh, B. Park, H. Roger-Smith, R. W. Wylie, and H. Nevil Smart (Hon. Sec.).

The Section has been more active this year than in previous years, although the membership has not greatly increased, the attendance at the meetings having been doubled on many occasions.

It may have been noticed that the name "Hampstead Photographic Society" has been used on notices when the Section has been referred to. This has been done with a view to attract prospective members who may read about the doings of the Section in the photographic press, and to secure a valuable title.

The Annual Lantern Slide Competition was held on Feb. 19th, and proved to be a very keen one. J. Ettlinger and J. B. King were awarded certificates for the best slides shown.

On May 23rd an outdoor meeting was held at Burnham Beeches, which was better attended than on any previous occasion. The weather was ideal for photographic work, and the outing was a great success.

The date of the Annual Exhibition having been fixed for January, 1909, instead of December, no exhibition was held during the year 1908.

The circulating portfolios have steadily gone forward in favour and are now one of the strong features of the Section.

In December the Section lost the valuable services of Miss Blyth on her marriage. She was Hon. Secretary of the "A"

portfolio from its inauguration, and had been one of the Society's most energetic workers, and a member of the Committee for some years.

Mr. H. B. Curwen has now become Hon. Secretary in her place. Mr. E. Staniland Pugh is Hon. Secretary of the "B" portfolio.

At the end of March Mr. H. Nevil Smart returned from Berlin and resumed the Secretaryship of the Section, which had been most ably carried on by Mr. E. Staniland Pugh during his absence.

The following meetings were held during the year :—

Wed. Jan. 8.—Demonstration on Gaslight Printing. O. C. Quekett.

Wed. Jan. 22.—Stereo-work, and a few remarks on Autochrome Colour Photography. P. H. Williams.

Wed. Feb. 5.—"The Humble Beauties of the Flower World." Edward Seymour.

Wed. Feb. 19.—The Annual Lantern Slide Competition.

Wed. March 4.—Demonstration on "Ozobrome." Thomas Manly.

Wed. March 18.—Holiday Papers:

1. "Ten Days in Holland." Dr. H. Roger-Smith.
2. "The North Devon Coast." E. Staniland Pugh.

Wed. April 8.—"Architectural Photography." R. W. Wylie, M.A.

Sat. May 23.—Outing to Burnham Beeches.

Wed. Nov. 11.—Demonstration "Mounting." O. C. Quekett.

Wed. Nov. 25.—Demonstration "Carbon Printing." R. W. Wylie, M.A.

Wed. Dec. 9.—Holiday Papers :

1. "Ely Cathedral." P. H. Williams.
2. "Germany." H. Nevil Smart.

## BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

### Conference of Delegates of Corresponding Societies at Dublin.

*Report to the Hampstead Scientific Society of its Delegate.*

Meetings of the Conference were held on September 3rd and 8th, at which your Delegate was present. The Hampstead Scientific Society is one of thirty-nine "Associated" Societies, such as do not publish results of original research. It is to be hoped that the time will come when, by original work being undertaken, the status of the Society will be raised.

At the first meeting Professor H. A. Miers, F.R.S., Chairman of the Conference, presided. His address dealt with the history and functions of Local Societies. He pointed out the great importance of the work done by them in the early years of the nineteenth century in popularising and promoting scientific ideas at a time when scientific publications were rare. To-day the great Scientific Societies are too highly specialised to appeal to the intelligent amateur. The valuable function of the Local Society is to break down the barrier between the professional and amateur; to give the specialist an opportunity of describing his work in simple language to a mixed audience; to develop by co-operation between professional and amateur, the educational opportunities that arise; and to encourage and direct original research. It is possible for the Local Societies to initiate a new Science Extension movement.

Mrs. Mary Hobson read a paper in which she drew attention to the necessity of forming reserves as sanctuaries for the preservation of our native Flora and Fauna. She deprecated the killing of animals and the gathering of plants and specimens for the mere stocking of private collections.

Professor Grenville A. J. Cole, Vice-Chairman, presided at the second meeting.

Professor G. H. Carpenter spoke on the advantages to be derived from detailed Natural History Surveys of restricted areas and the suitability of such work for Local Societies. He instanced the researches carried out in Lambay Island and on the North Bull in Dublin Bay.

Mr. Henry Davey introduced the subject of the advisability of the reintroduction and distribution of species that have become extinct or rare.

A catalogue of the more important papers published by the Corresponding Societies during the previous year is given with the Report of the Corresponding Societies Committee.

C. O. BARTRUM.

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## SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

### CONGRESS AT HASTINGS.

*Report to the Hampstead Scientific Society of its Delegate at the Congress.*

The thirteenth Annual Congress was held at Hastings on June 10th, 11th, 12th, and 13th. Many Delegates, Associates and Members attended. Your Natural History Secretary acted as Delegate of this Society, and other members of the Society were also present.

The President of the Congress was Sir Archibald Geikie, K.C.B., F.R.S. His address to the Congress was an exceedingly vivid and concise history of the formation of the Wealden, in the centre of the coast of which this Congress was being held. The address is published in the *South-Eastern Naturalist* for 1908. Many interesting papers were read. Excursions into the surrounding country took place each afternoon.

The proposal of your Delegate at the last Congress that Hertford and Essex should be included in the counties covered by the Union was laid before the General Committee on Thursday, 11th, and passed unanimously.

The Congress Museum was arranged in Trinity Hall, Hastings. Among the exhibits was a selection from the lantern slides illustrating the lecture "Familiar Trees" presented to the Union by this Society. The Autumn Meeting of the Union was held at Tring in November.

The next Congress will be held at Winchester in June, 1909.

HUGH FINDON.

# Rules.

*As amended and approved at the Annual Meeting, February 5th,* 1909.

1. The Society shall be called the "HAMPSTEAD SCIENTIFIC SOCIETY," and shall have for its objects the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science.

2. The Society shall consist of ordinary members, ladies and gentlemen, who shall pay a minimum Annual Subscription of Five Shillings, and of Honorary Members. All Subscriptions shall be due on the 1st January in each year.

3. The Officers of the Society shall consist of a President, Vice-Presidents, Honorary Secretary and Honorary Treasurer, and a Council of Members not exceeding fifteen, including the Honorary Secretaries of Sections.

4. The President, Officers, and Council shall be elected annually. The Council shall have power to fill up any vacancy that may occur among the Officers and Council pending the Annual General Meeting.

5. The business of the Society shall be conducted by the Officers and Council in general Committee, five to form a quorum. The Council may appoint an Executive Committee for the purpose of transacting and arranging details in connection with the general work of the Society. The Executive Committee to consist of not less than seven, of whom the Honorary Treasurer, Honorary Secretary, and Sectional Honorary Secretaries shall be *ex officio* members. The Council of the Society shall meet not less than twice in each year.

6. The Council shall prepare, and cause to be read at the Annual Meeting of Members, a Report on the affairs of the Society for the preceding year.

7. Two auditors shall be elected annually, who shall audit the Treasurer's Accounts, and the Treasurer shall produce a Balance Sheet and Statement of Accounts at the Annual Meeting.

8. Candidates for membership shall be proposed by an existing member, and seconded by one or more members. The election of

members may take place at any ordinary meeting of the Society, the voting to be by show of hands, or by ballot ; and when a majority of members present are in favour of the candidate he or she shall be duly elected.

9. No new member shall be entitled to any of the privileges of the Society until the Subscription for the current year shall have been paid.

10. Each member shall have the right of being present, and to vote, at all general meetings of the Society, and to propose candidates for membership. Each member shall also have the privilege of introducing two visitors to the ordinary and field meetings of the Society, except when otherwise arranged by the Council.

11. No member shall have the right of voting, or be entitled to any of the advantages of the Society if his or her subscription shall be twelve months in arrears. If any member's subscription shall be in arrears for two years the Council shall have the power, in its discretion, to remove his or her name from the list of members.

12. The Annual General Meeting shall be held during the first three months of the year for the election, or re-election, of Officers for the year ensuing, to receive the Reports, and to transact any other business.

13. The Ordinary Meetings of the Society shall be held on the first Friday in the months of November, December, January, February, March, April, and May, or at such other date, and at such place, as may be determined by the Council.

14. At the written request to the Secretary of not less than ten members a Special Meeting may be summoned, and no other business may be transacted but that which was stated on the notice convening the meeting. Ten days' notice in writing shall be given by the Secretary to each member of the Society, such notice to contain a copy of the requisition.

15. The telescope, and any instruments, books, slides, &c., in the possession of the Society shall be made available for members' use under such regulations as the Council may direct.

16. The Council shall have the power to recommend to the

members any gentleman or lady, who may have contributed scientific papers, or otherwise benefited the Society, to be elected an Honorary Member ; such election to be by show of hands.

17. Separate Sections of the Society may be formed, at the discretion of the Council, for the purpose of carrying on work in particular branches of Science. The Honorary Secretary of each Section shall be an *ex officio* member of the Council and Executive Committee.

18. No alteration or addition to these Rules shall be made except at the Annual General Meeting, or at a meeting specially convened for the purpose. Notice of any such proposed alteration shall be given to the Secretary at least fourteen days before the Annual Meeting.

# List of Members.

***Corrected to March 5th, 1909.***

**Members are particularly requested to notify any change of address to the Hon. Secretaries of the Society, 12, Heath Mansions, Heath St., Hampstead, N.W.**

## Honorary Members.

Bushe-Fox, J. P. .. .. .. Ben Lomond House, Downshire Hill, N.W.
Dawkins, Prof. W. Boyd, M.A., D.Sc., F.R.S. Fallowfield House, Manchester
Heberden, Colonel Henry, R.A., J.P., 28, Buckland Crescent, Hampstead
Jermyn, F. Lubbock .. .. Danny Corner, Hurstpierpoint
Martin, Basil, W., M.B., Ch.B., F.Z.S. 5, Upper Marine Terrace, Margate
Womack, Frederick, M.B., B.Sc. (Member of Council) 115, Alexandra Road

## Ordinary Members.

Abbott, Rev. E. A., D.D. .. Well Side, Well Walk
Acret, Charles, F.R.G.S. .. .. 43, Rosslyn Hill
Acworth, J. J., Ph.D., F.I.C., F.C.S. Thornbank, Shoot-up-Hill, Brondesbury
Alcock, N. H., M.D. .. .. 22, Downshire Hill
Alcock, S. P. .. .. .. 5, Rudall Crescent
Allcock, Miss N. .. .. .. 20, Shirlock Road, Gospel Oak
Allen, A. Jukes .. .. .. 17, Well Walk
Apps, J. L. B. .. .. .. 17, Stanley Gardens, Haverstock Hill, N.W.
Argyle, Jesse .. .. .. *Express* Office, High Street
Arnold, Miss Lucy .. .. 27, Melrose Avenue, Willesden Green, N.W.
Ashworth, Percy H. .. .. Stock Exchange, E.C.
Atkin, Geo. Duckworth .. .. 9, Lindfield Gardens
Atkinson, B. E. .. .. .. 14, Rosslyn Hill
Atkinson, Robert .. .. .. 14, Rosslyn Hill
Avenell, George .. .. .. 17, Worsley Road

Baillie, James R. .. .. .. 1, Akenside Road
Baily, Walter, M.A., F.Z.S. (Vice-President) .. 4, Rosslyn Hill

Baker, F. H. .. .. .. 95, Belsize Road
Bakewell, H. J. .. .. .. 60, South Hill Park
BARHAM, SIR GEORGE, J.P. (Vice-President) 112, Haverstock Hill
BARTRUM, C. O., B.Sc. .. .. 12, Heath Mansions, Heath Street
(Hon. Secretary of the Society)
Bartrum, Mrs. C. O. .. .. 12, Heath Mansions, Heath Street
Bartrum, Miss .. .. .. 14, Gayton Crescent
Bartrum, Miss E. M., B.A. .. 14, Gayton Crescent.
Bashford, Mrs. .. .. .. 10, Prince Arthur Road
Bell, Edward, M.A. .. .. The Mount, Heath Street
Berridge, Miss A. L. .. .. 24, Thurlow Road
Bird, Miss Alice .. .. .. 6, Windmill Hill
Blair, Alec Hood .. .. .. Wygtoun, Crediton Road
Blyth, C. F. T. .. .. .. 22, Tanza Road
Blyth, E. K. .. .. .. 6, Rosslyn Hill
Boyce, Mrs. Louis E. .. ..
Bradford, Henry .. .. .. 37, Trevor Square, S.W.
Brown, W. Carnegie, M.D. .. 13, Hampstead Hill Gardens
BRYANT, MRS. SOPHIE, D.Sc. (Vice-President) .. 6, Eldon Road
Burton, James .. .. .. 11, Ulysses Road, West Hampstead
Bushe-Fox, Miss L. .. .. Ben Lomond House, Downshire Hill
Buszard, Frank .. .. .. 30, Glenloch Road, Haverstock Hill, N.W.

Carter, William, M.A. .. .. Grove House, 1, Belsize Grove.
Challen, Frank .. .. .. 20, West Hill, Highgate
Champneys, Mrs. .. .. .. Hall Oak, Frognal Lane
Chandler, P. W. .. .. .. 5, Rosslyn Gardens
Channing, F. C., F.Z.S. .. .. 62, Fellows Road
Chapman, A. C., F.I.C. .. .. 38, Primrose Hill Road
Chapman, Mrs. A. C .. .. 38, Primrose Hill Road
Clarke, Miss .. .. .. .. 4, Wellington Place, N.W.
Clarke, Rev. Edward T. .. .. 36, Maitland Park Road.
Clarke, Henry, J.P. .. .. Cannon Hall
Claudet, A. C. .. .. .. 27, Daleham Gardens
Coates, Joseph .. .. .. 13, Willoughby Road
Conder, Hugh .. .. .. "East View," Bloomfield Road, Highgate, N.
Cooke, A. Clement .. .. .. 9, Minster Road, West Hampstead
Cooke, Mrs. A. C .. .. 9, Minster Road, West Hampstead

Cooke, Conrad W., M.I.E.E. .. The Pines, Langland Gardens.
COTTAM, G. H., M.I.E.E. (Member of Council) 38, Glenloch Road
Crawshay-Williams, Leslie .. 73 Boundary Road
CRUMP, E. COMPSON (Hon. Treasurer) .. .. 28, High Street
Crump, Mrs. E. C. .. .. 28, High Street
Cubley, Arthur, M.D. .. .. North Western Hospital
Cunnington, C. H. .. .. 88, West End Lane
CUNNINGTON, C. W., M.R.C.S., D.P.H. (Member of Council) 86, West End Lane
Curwen, Harold .. .. .. 1, Woburn Square, W.C.
CURWEN, H. B. .. .. .. Enfield House, Windmill Hill (Member of Council)

Darley, C. W., I.S.O., M.I.C.E. .. 5, Arkwright Road
Davis, E. .. .. .. .. 2, East Heath Road
Davis, R. R. .. .. .. 2, East Heath Road
Dawson, William, B.Sc. .. .. 49, South Hill Park
de Vesian, Roland Ellis .. .. 6, Gayton Crescent
Deedes, Rev. Brook, M.A. .. The Vicarage, Hampstead
Dickinson, F. L. A. .. .. 12, Ferncroft Avenue
Dowson, Mrs. .. .. .. Gerrard's Cross, Bucks
Drummond, J. C. .. .. .. 12, Worsley Road
Drummond, Mrs. .. .. .. 12, Worsley Road
Drysdale, Mrs. .. .. .. Wick Hall, Radley, Berks
Dudman, J. .. .. .. 28, The Grange Drive, Winchmore Hill, N.
Dudman, G. Henderson .. .. 16, Redbourne Avenue, Church End, Finchley, N.
Dunbar, J. .. .. .. .. Rose Cottage, South End Road
Dyer, Bernard, D.Sc. .. .. 15, Lindfield Gardens
Dyer, Mrs. .. .. .. .. 15, Lindfield Gardens

Eckenstein, Miss Lina .. .. 34, Greencroft Gardens
EDGEWORTH, PROFESSOR F. Y., M.A., D.C.L. (Vice-President) 5, Mount Vernon
Esson, W. B., M.I.C.E., M.I.E.E. 127, Adelaide Road
Ettlinger, Julius .. .. .. 83, Greencroft Gardens

Fairclough, Alfred N. .. .. 6, Dartmouth Road, Brondesbury
Faraday, Harold .. .. .. 8, Oak Hill Park, Frognal
Fielder, Mrs. .. .. .. 6, Fellows Road

Figgis, Samuel .. .. .. Montague Grove, Frognal
FINDON, HUGH, F.L.S. .. .. 58, Carleton Road, Tufnell Park, N.
(Natural History Secretary).
Flatau, B. R. .. .. .. 6, Upper Hamilton Terrace, N.W.
Fluck, A. W. .. .. .. 54, Brookfield, Highgate
Forbes, Mrs. .. .. .. Grove House, 16, Rosslyn Hill
Fox, R. Fortescue, M.D. .. .. 13, Belsize Park Gardens, N.W.
Fox, R. Hingston, M.D. .. .. 19, Hampstead Hill Gardens, N.W.
Freuer, Miss .. .. .. .. 32, Willoughby Road

Gard, W. G. Snowdon, LL. B., F.G.S., 9, Rosslyn Hill
Garlick, Miss .. .. .. 11, Well Road
GARNETT, WILLIAM, M.A., D.C.L. The Wabe, Redington Road
(Member of Council)
Gasquoine, Frank W. .. .. 135, Constantine Road
Godden, William .. .. .. 143, Chapter Road, Willesden Green
Goodchild, Herbert, M.B.O.U. .. 66, Gloucester Road, Regent's Park
Gow, Rev. Henry, B.A. .. .. 3, John Street
Gray, Arthur L. .. .. .. Brooklyn, First Avenue, Hendon, N.W.
Grenfell, J. S. Granville, M.A. .. Heath Mount School, Heath Street
Grundy, Edmund F. .. .. 14, Thurlow Road
Grundy, Mrs. E. F. .. .. .. 14, Thurlow Road

HARBEN, SIR HENRY, J.P... .. Seaford Lodge, Fellows Road
(Vice-President)
Hastie, Peter .. .. .. 24, Park Hill Road
HAYNS, JOHN, .. .. .. Campbell Cottage, 20, John Street
(Member of Council)
Herford, R. H. .. .. .. 2, John Street
Hinderlich, Albert .. .. .. 15, Lyncroft Gardens
Holmes, Morell F. .. .. .. 59, South Hill Park
Homfray, Mrs. G. .. .. .. 16, Church Row
Homfray, Miss .. .. .. 16, Church Row
Hopkins, A. E. .. .. .. 9, Howitt Road
HOPSON, MONTAGU F., F.L.S., F.E.S. 30, Thurlow Road
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Hopson, Mrs. .. .. .. 30, Thurlow Road
Hunt, E. J. .. .. .. 2, Frognal Mansions, N.W.
Hunter, J. W. .. .. .. 41, Lancaster Road, S. Hampstead
Hutchinson, Rev. H. Neville, B.A., 17, St. John's Wood Park, N.W.
F.G.S., F.Z.S.

Jackson, Dr. D. H. .. .. 95, Abbey Road
James, Leonard, M.A. .. .. 8, Lyndhurst Road
James, Mrs. .. .. .. .. 8, Lyndhurst Road
Jealous, Mrs. .. .. .. 95, Fitzjohn's Avenue.
Jessop, Edward, M.R.C.S., L.R.C.P., 81, Fitzjohn's Avenue
Jones, A. Denman .. .. .. St. Aubyn's, The Vale
Jones, George Edward .. .. 70, Belsize Park Gardens
Jones, V. Vaughan .. .. 9, Well Walk
Jones, Miss H. Vaughan .. .. 9, Well Walk
Jordan, N. G. .. .. .. 8, Belsize Avenue

Kearne, Miss .. .. .. 1, Lyndhurst Gardens
Kidner, Miss B. M. .. .. St. Martin's, Thurlow Road
Kinder, Miss M. A. .. .. 44, Willow Road
King, J. B. .. .. .. 2, Briardale Gardens, Platt's Lane
King, Mrs. M. L. .. .. .. 18, Lyndhurst Road
Knowles, C. Heygate, L.D.S. Eng. 18, Worsley Road

Laverie, J. A. .. .. .. 5, Carlingford Road
Law, J. A. .. .. .. .. 12, Frognal Mansions
Law, Mrs. .. .. .. .. 12, Frognal Mansions
Lister, Miss .. .. .. .. Upper Heath
Lown, H. F. .. .. .. 31, Aberdare Gardens

Mager, G. E. .. .. .. 28, Carleton Road, Tufnell Park, N.
Mallam, W. A., M.R.C.S., L.R.C.P., 63, Rosslyn Hill
Marker, A. H. .. .. .. 11, Heath Drive
Marks, K. I., F.R.M.S. .. .. 4, Woodchurch Road
Marshall, Percy E. .. .. Netley Cottage, The Grove
Martelli, Miss Agnes .. .. 6, Prince Arthur Road
Martin, Miss F. .. .. .. 3, Foley Avenue
Mason, Miss Ella .. .. .. 8, Priory Road, West Hampstead
May, W. E. Southcombe .. .. 15, Endsleigh Gardens, N.W.
Melliss, H. J., B.A. .. .. 16, Hollycroft Avenue
Messenger, H. W., L.D.S. .. 47, Rosslyn Hill
Middleton, L. .. .. .. 17, Willoughby Road
Millar, Henry E. .. .. .. Heathdown, East Heath Road
Money, C. J. .. .. .. 8a, Heath Street
Moore, Miss M. E. .. .. 50, Willow Road
Murdoch, G. H. .. .. .. 49, Parliament Hill Road
Musmann, E. P. B. .. .. .. 61, Frognal Mansions

Nicholls, Miss Sophie .. .. 6, Eldon Road

Organ, Miss Winifred C. .. .. 60, Dale Road, Gospel Oak

Pace, Harry .. .. .. 21, Constantine Road
Page, Reginald W. .. .. .. 31, Buckingham Mansions
PALMER, J. E. (Member of Council) 17, Worsley Road
Paine, F. E. .. .. .. Hillfield, Haverstock Hill
Park, Mrs. .. .. .. .. 92, Fellows Road
Park, B. C. P. .. .. .. 92, Fellows Road
Parker, Miss C. M. .. .. .. "The Wych," John Street
PAYNE, E. S. .. .. .. 45, Rosslyn Hill
(Member of Council)
Pearce, Robert, M.P. .. .. Beechcroft, East Heath Road
Pearce, Mrs. .. .. .. Beechcroft, East Heath Road
Pearce, Miss .. .. .. Beechcroft, East Heath Road
Pearse, D. Colbron .. .. 11, Worsley Road
PETRIE, Prof. W. M. FLINDERS, 8, Well Road
D.C.L., LL.D., Ph.D., F.R.S.
(Vice-President)
Petrie, Mrs. Flinders .. .. 8, Well Road
Pidcock, G. D., M.A., M.D., M.R.C.P. 74, Fitzjohn's Avenue
Pidgeon-Fletcher, G. J. .. .. 2, Manstone Road, Cricklewood
Plowman, H., F.S.A. .. .. 23, Steele's Road
Prance, R. H. .. .. .. 29, Netherhall Gardens
Pugh, E. Staniland.. .. .. 31, Belsize Road
Purry, Walter .. .. .. 44, Well Walk
Purry, Mrs. .. .. .. 44, Well Walk

Quekett, O. C. .. .. .. 70, Greencroft Gardens

Radcliffe, Henry .. .. .. 18, Tanza Road
Raisin, H. W. .. .. .. Hawk's Nest, Stanhope Avenue, Church End, Finchley
Rangel, Miss .. .. .. 17, Willoughby Road
Ransom, H. B. .. .. .. 28, Belsize Park Gardens, N.W.
Rayner, Henry, M.D. .. .. Upper Terrace House
Ridges, Miss Marian .. .. "Aberdeen," South End Road
Ridley, Miss J. .. .. .. 31, Daleham Gardens
Robins, P. S. .. .. .. 20, Greencroft Gardens
ROGER-SMITH, HUGH R., M.D. .. 1, College Terrace
(Member of Council)
Rowney, W. G. .. .. .. 2, Oakhill Park
RUDLER, F. W., I.S.O., F.G.S. .. Ethel Villa, Rickett's Hill, Tatsfield, Westerham
(Vice-President)

Russell, Chas. A., K.C. .. .. 53, Netherhall Gardens
Russell, Mrs. .. .. .. 53, Netherhall Gardens

Sanders, C. G. .. .. .. 23, Ferncroft Avenue
Sanders, Mrs. C. G. .. .. .. 23, Ferncroft Avenue
SCHRÖDER, WALTER .. .. Telegraph Hill, West Heath
(Member of Council)
Scull, Miss E. M. L. .. .. St. Edmund's, Worsley Road
Shackleton, Miss M. H. .. .. 17, Denning Road
Sharman, Henry, M.D. .. .. Sedgemoor, Arkwright Road
Shenton, E. W. H., M.R.C.S. L.R.C.P. 7, Heath Mansions, The Grove
Shenton, Mrs. E. W. H. .. .. 7, Heath Mansions, The Grove
Sibson, A. E. .. .. .. 19, Carlingford Road
Sloper, G. Randall .. .. 24, Lymington Road
Smart, H. A. .. .. .. 40, Compayne Gardens
SMART, H. NEVIL (Photographic Secretary) 40, Compayne Gardens
Smith, R. T., M.D., Lond. .. 117, Haverstock Hill, N.W.
Stamp, F. U. .. .. .. 29a, High Street
Stamp, Mrs. F. U. .. .. .. 29a, High Street
Stevenson, E. H. .. .. .. 43, Redington Road
STOKES, A. W., F.C.S., F.I.C. .. 60, Park Hill Road
(Member of Council)
Stokes, Mrs. .. .. .. 60, Park Hill Road
Stopes, Miss Marie C., D.Sc., Ph.D. 53, Stanley Gardens
Strange, R. Gordon, M.S., M.B. .. 2, Belsize Avenue
Strange, Miss .. .. .. 2, Belsize Avenue
Such, Henry .. .. .. .. 2, Manor Mansions, Belsize Park Gardens
Suiter, Miss M. .. .. .. "The Wych," John Street

Taylor, E. Claude, M.D., F.R.C.S., M.S. Eland House, Rosslyn Hill
Taylor, Dr. G. F. Noel, L.R.C.P., L.R.C.S.E. 128, Mansfield Road
TEBB, A. E., M.D., B.S., D.P.H. .. 226, Finchley Road.
(Member of Council)
Tebb, Mrs. A. E. .. .. .. 226, Finchley Road.
Thompson, A. Hugh, M.A., M.D... 26, Ellerdale Road
Thompson, Miss J. A. .. .. 2, Narcissus Road
THOMPSON, Prof. SILVANUS, P., D.Sc., F.R.S. (Vice-President) Morland, Chislett Road, West Hampstead
Thorn, Miss M. .. .. .. 16, Estelle Road, Gospel Oak, N.W.

Thorn, Miss R. .. .. .. 16, Estelle Road, Gospel Oak, N.W.
Thrower, Alfred .. .. .. 124, Haverstock Hill
Thwaite, Mrs. .. .. .. 10, Carlton Terrace, Child's Hill, N.W.
Tiver, Ernest . .. .. 8, Christchurch Place
Turck, Miss Eliza .. .. .. 7, St. George's Square, Primrose Hill
Turner, G. H. .. .. .. 35, Rosslyn Hill

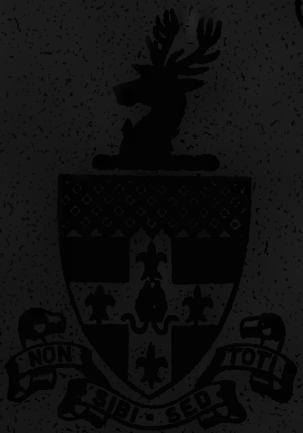
Underdown, Herbert W. .. .. Birkbeck Chambers, Chancery Lane, E.C.

Viner, Miss F. A. .. .. .. 15, Thurlow Road
VIZARD, P. E., F.R.A.S. (Vice-President and Astronomical Secretary) .. Belsize Lodge, Belsize Lane
Vizard, W. G. .. .. .. 17, South Hill Park.

Waghorn, John .. .. .. 11, Arkwright Road
Waghorn, Mrs. J. .. .. 11, Arkwright Road
Wallis, Ernest .. .. .. Lested Lodge, Well Walk
Wallis, Mrs. Ernest .. .. Lested Lodge, Well Walk
Watson, Miss H. M. .. .. 12, Canterbury Mansions, Lymington Road
Way, Miss E. M. .. .. .. Holly Terrace House, Mount Vernon
Way, Miss L. A. .. .. .. Holly Terrace House, Mount Vernon
Whiting, James E. .. .. .. South End Road
Wight, George P. .. .. .. 29, Nassington Road, N.W.
Wilkins, Rev. W. H., M.A. .. 16, St. George's Road, Kilburn, N.W.
WILKS, Sir SAMUEL, Bart., LL.D., F.R.S. (President) M.D., 8, Prince Arthur Road
Wilks, William .. .. .. 19, Denning Road
Wilks, Mrs. .. .. .. .. 19, Denning Road
Williams, Philip H., A.C.A. .. 41, Downshire Hill
Wilson, Prof. H. A., M.A., D.Sc., F.R.S. 8, The Pryors, East Heath Road
Wood, Henry J. .. .. .. 4, Elsworthy Road, N.W.
Woolf, M. Yeatman, F.E.S. .. 46, St. John's Wood Park
Wright, Miss Elizma .. .. 17, Stanley Gardens, N.W.
WYLIE, R. W., M.A. (Honorary Secretary of the Society) 44, Avenue Road, Highgate, N
Wylie, Mrs. R. W. .. .. 44, Avenue Road, Highgate, N.

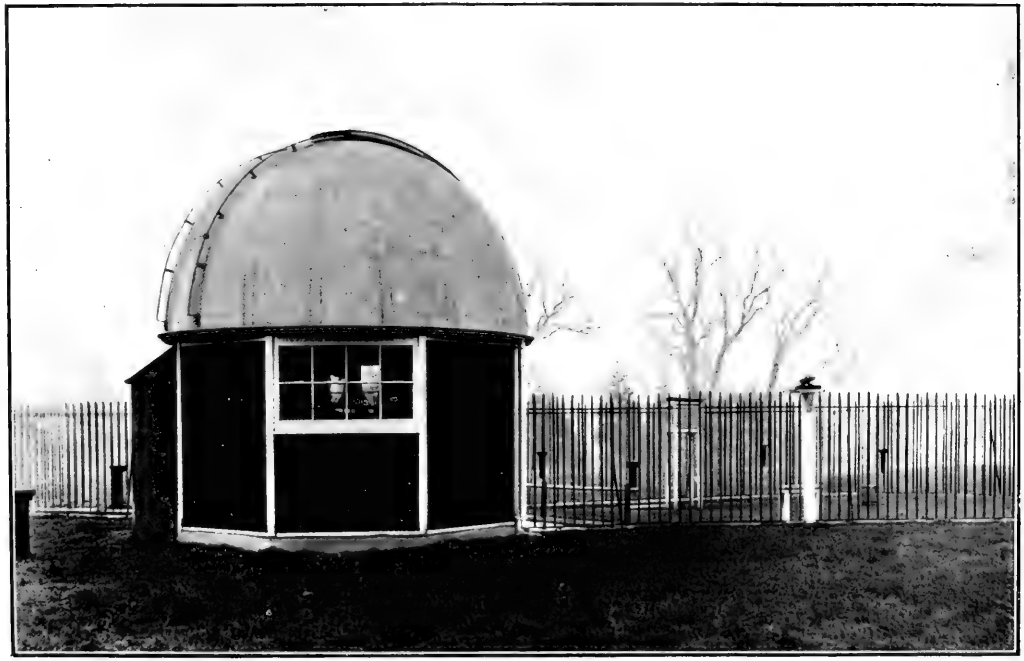
# REPORT OF THE HAMPSTEAD SCIENTIFIC SOCIETY.






1909.

HAMPSTEAD OBSERVATORY AND METEOROLOGICAL STATION.



Altitude 450 feet; Latitude 51° 34′ N; Longitude 0° 11′ W.

# Hampstead Scientific Society.

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# Report of the Council and Proceedings.

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With a List of the Members.

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*For the Year* 1909.

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PRICE THREEPENCE.

Published by the Society,
STANFIELD HOUSE, PRINCE ARTHUR ROAD,
HAMPSTEAD, N.W.
MDCCCCX.

THE HAMPSTEAD SCIENTIFIC SOCIETY was founded in 1899 for the promotion of the study of, and encouragement of a popular interest in, Astronomy, Natural History, Photography, and other branches of Science. There are at present three Special Sections of the Society—Astronomical, Natural History, and Photographic.

The Society is an "Associated Society" of the British Association for the Advancement of Science.

A General Meeting of the Society is held on the first Friday in each month from November to May. At each meeting a paper or lecture of general scientific interest is given, and discussion invited. The chair is taken at 8.30 precisely. Meetings of the Astronomical Section take place from time to time as they can be arranged. The Natural History Section meets on the second Friday in each month, and the Photographic Section twice a month.

The first General Meeting takes the form of a Conversazione at the Town Hall. Other meetings are generally held at the Hampstead Subscription Library, Prince Arthur Road.

During the summer months Out-door Meetings are organised.

The Society possesses a small Astronomical Observatory and a Meteorological Station on the Reservoir near the Whitestone Pond.

The *minimum* Subscription is Five Shillings per annum. Those members who are able are asked to subscribe more, as five shillings is not sufficient to cover expenses.

Members have the privilege of being present at all Meetings of the Society, both General and Sectional, and of receiving a copy of the Annual Report. Members may also introduce two visitors at any Ordinary Meeting—unless otherwise arranged by the Council. Membership of the Society includes Membership of all the Sections, full particulars of which can be obtained of the respective Hon. Secretaries.

**Application Forms for Membership, and further particulars as to the general work of the Society, can be obtained from the undersigned.**

C. O. BARTRUM,
R. W. WYLIE, } *Hon. Secretaries of the Society,*

12, Heath Mansions, Heath Street,
Hampstead, N.W.

*February*, 1910.

# Hampstead Scientific Society.

## *List of Officers for the Year 1910.*

**President.**

Prof. W. M. FLINDERS PETRIE, D.C.L., LL.D., F.R.S.

**Vice-Presidents.**

WALTER BAILY, M.A.*
Sir GEORGE BARHAM, J.P.
Mrs. SOPHIE BRYANT, D.Sc., D.Litt.
Prof. F. Y. EDGEWORTH, M.A., D.C.L., F.B.A.
Sir HENRY HARBEN, J.P.
F. W. RUDLER, I.S.O., F.G.S.
Prof. SILVANUS P. THOMPSON, D.Sc., F.R.S.
P. E. VIZARD, F.R.A.S.*
Sir SAMUEL WILKS, Bart., M.D., LL.D., F.R.S.
F. WOMACK, M.B., B.Sc.

**Council.**

(The President, Vice-Presidents, Hon. Treasurer and Hon. Secretaries, *ex-officio*.)

GEO. H. COTTAM, M.I.E.E.
C. W. CUNNINGTON, M.R.C.S.
H. B. CURWEN.*
W. GARNETT, M.A., D.C.L.
JOHN HAYNS.
MONTAGU F. HOPSON, F.L.S., F.E.S.
E. S. PAYNE.*
HUGH R. ROGER-SMITH, M.D.
WALTER SCHRÖDER.
A. W. STOKES, F.C.S., F.I.C.
A. E. TEBB, M.D., B.S., D.P.H.

**Hon. Secretaries.***

C. O. BARTRUM, B.Sc.
12, Heath Mansions,
Heath Street,
Hampstead, N.W.

R. W. WYLIE, M.A.
44, Avenue Road,
Highgate, N.

**Hon. Treasurer.***

E. COMPSON CRUMP,
L. & S.W. Bank, Ltd., High Street, Hampstead.

**ASTRONOMICAL SECTION:**

Hon. Secretary.*
P. E. VIZARD, F.R.A.S.
Belsize Lodge, Belsize Lane,
Hampstead.

**PHOTOGRAPHIC SECTION:**

Hon. Secretary*
H. NEVIL SMART.
40, Compayne Gardens,
West Hampstead.

**NATURAL HISTORY SECTION:**

Hon. Secretary.*
HUGH FINDON, F.L.S.
3, Torriano Avenue, Camden Rd., N.W.

**HON. METEOROLOGIST:**

E. L. HAWKE, F.R. Met.Soc.,
2, Akenside Road, N.W.

* *Executive Committee.*

# Report of the Council

FOR THE YEAR 1909.

*Read at the Annual Meeting, February 4th, 1910.*

THE past year has witnessed the completion of the first ten years of the existence of the Society. It is satisfactory to the Council to be able to record that in the last of these ten years it has shown the most vigorous vitality. In no previous year have the number nor the interest of the meetings been so great; the year has also seen the consummation of the desire of the Council to establish an Astronomical Observatory and Meteorological Station on the top of Hampstead hill. Thirty-eight new members have joined the Society, the number now standing at 274.

Sir Samuel Wilks, though in excellent health, has felt himself compelled through advancing years to resign the Presidentship of the Society. He is willing to continue as a Vice-President. In the past year Sir Samuel Wilks has taken a most active part in the works of the Society, especially in connection with the Observatory movement. The members, in whose affectionate regard he has for so long been established, are assured of a continuance of his active interest in their work.

Thirty-three ordinary meetings, general and sectional, have been held in 1909, in addition to six vacation meetings, and three Christmas lectures to Juveniles.

The great amount of labour and money that were expended upon the arrangements for the Annual Conversazione were repaid by the success of the meeting. The thanks of the Society are due to Professor W. M. Flinders Petrie for the lecture he gave on that occasion.

The attendance at the General Meetings has improved.

A class for the systematic study of Elementary Astronomy, conducted by Mr. P. E. Vizard, F.R.A.S., met during the spring. The class, though small, was much appreciated by those attending it. Lockyer's 'Elementary Lessons in Astronomy" was the text-book used.

A new and valuable feature of the work of the Natural History Section has been initiated by its committee. Before the ordinary meetings a class in Elementary Zoology is held by Dr. F. O'Brien Ellison with a view to refreshing the memory of members in fundamental principles, and to bringing recruits to the Section. Mr. Hugh Findon is to be congratulated on his conduct of the Section.

The work of the Photographic Section again shows distinct progress. The circulating portfolios tend to keep the members in touch with one another and are found to be one of the best means of improving the standard of work. A healthy sign of the growth of this Section is evidenced by the fact that the number of exhibits sent to the Annual Exhibition has nearly doubled within the last four years.

The proceedings at the General and Sectional Meetings will be found on pages 14 to 34.

As was the case in 1908 an outdoor meeting was held in each of the six months of the vacation, four of which were of interest more especially to Natural History members, one was a joint meeting of the Natural History and Photographic Sections, and one was a visit to the Tower of London.

A course of four Juvenile lectures has again been arranged by Mr. Vizard during the present Christmas holidays, and promises to be thoroughly appreciated.

The British Association having met this year in Canada, the Annual Conference of Corresponding Societies was held in October in Burlington House, London. Mr. C. O. Bartrum attended as Delegate of the Society. His report of the Conference is printed on page 38.

Mr. Hugh Findon represented the Society at the Annual Congress of the South Eastern Union of Scientific Societies held at Winchester (June 9th–12th), under the presidency of Dr. D. H. Scott. His report is to be found on page 39.

The efforts made for the last three years to establish an Astronomical Observatory and Meteorological Station have been crowned with success. With much public spirit the Metropolitan Water Board acceded to the request of the Council to be allowed the use for the purpose of a portion of the surface of the covered reservoir near the Whitestone Pond. Plans and estimates were drawn up, and a special meeting of members was held on April 2nd, when the project met with unanimous approval. An appeal for subscription was issued, and received a most generous response. Building was proceeded with, and an opening ceremony held on November 6th. An

Astronomical Clock has been generously presented by Mr. Edward Duveen. Arrangements have been made for the Meteorological records to be taken twice daily. The results will be published in the monthly return of the Meteorological Office from January 1st, and, by the courtesy of the Editor, in *The Hampstead and Highgate Express*.

Mr. E. L. Hawke, F.R.Met.Soc., has kindly consented to superintend the Meteorological Station. Owing to the many details that have required attention and the rarity of star-light nights for the adjustment of the telescope, the Observatory Committee has as yet been unable to issue arrangements for the use of the telescope. Fuller details of matters connected with the establishment of the Observatory will be found on pages 35 to 37.

The family of the late Mr. J. Hort Player, formerly a member, presented a quantity of useful photographic and chemical apparatus to the Society. These were partly disposed of amongst the members, and the remainder among the students at University College, Miss Homfray having kindly undertaken the arrangements for the latter. The proceeds, amounting to £6 1s. 7d. have been added to the funds of the Society.

Statements of receipts and expenditure on account of the ordinary work of the Society and of the Observatory, are printed on pages 10 and 11. The receipts show an increase on those of last year. The expenditure has been greater owing to the larger number of meetings, and to the greater expenditure upon the Conversazione. A deficit of £1 11s. 5d. is shown upon the year's working. The list of donations

to the Observatory Fund on pages 12 and 13 will show more eloquently than words how generous has been the response to the appeal to the Council. A deficit of £12 15s. 4d. remains on this Fund. It is estimated that the annual cost of maintaining the Observatory and taking the Meteorological records will be about £20.

# STATEMENT OF ACCOUNTS FOR 1909.

## RECEIPTS.

| | £ | s. | d. |
|---|---|---|---|
| 1909 Subscriptions paid in 1908, brought forward ... ... ... ... £9 11 6 | | | |
| 1909 Subscriptions... ... ... ... 63 12 6 | | | |
| | 73 | 4 | 0 |
| 1908 Subscriptions paid in 1909... ... ... | 2 | 15 | 0 |
| 1907 ,, ,, ,, ... ... ... | 0 | 5 | 0 |
| | 76 | 4 | 0 |
| Donation, per A. Hinderlich ... ... ... | 1 | 0 | 0 |
| Conversazione and Lecture Tickets ... ... | 5 | 0 | 6 |
| Proceeds of Sale of Lamp ... ... ... | 1 | 0 | 0 |
| ,, ,, Chemical Apparatus ... | 6 | 1 | 7 |
| Total Receipts for 1909 ... ... ... | 89 | 6 | 1 |
| Deficit ... ... ... ... ... ... | 3 | 14 | 6 |
| | £93 | 0 | 7 |

## EXPENDITURE.

| | £ | s. | d. |
|---|---|---|---|
| Astronomical Section ... ... ... ... | 1 | 4 | 0 |
| Natural History Section... ... ... ... | 4 | 9 | 6 |
| Photographic Section ... ... ... ... | 14 | 16 | 0 |
| General Meetings... ... ... ... ... | 4 | 14 | 1 |
| Conversazione ... ... ... ... ... | 20 | 3 | 9 |
| Vacation Meetings ... ... ... ... | 2 | 6 | 11 |
| Juvenile Lectures... ... ... ... ... | 2 | 18 | 6 |
| Printing and Delivering Report ... ... | 8 | 12 | 7 |
| S.E. Union Meeting ... ... ... ... | 0 | 12 | 3 |
| Subscription to S.E. Union of Scientific Societies | 0 | 7 | 6 |
| Subscription to Royal Photographic Society... | 1 | 1 | 0 |
| Advertisements ... ... ... ... ... | 6 | 6 | 0 |
| Sale of Chemical Apparatus (expenses) ... | 1 | 5 | 0 |
| Sundry General Purposes ... ... ... | 22 | 0 | 7 |
| Total Expenditure during 1909 | 90 | 17 | 8 |
| Deficit brought forward from 1908 ... | 2 | 2 | 11 |
| | £93 | 0 | 7 |

Subscriptions in hand for 1910 paid in 1909, £13 17s. 0d.

*Examined with vouchers and accounts, and found correct,* { E. S. PAYNE, WALTER SCHRÖDER

E. COMPSON CRUMP, *Hon. Treasurer.*
Hampstead, 24th January, 1910.

# OBSERVATORY FUND.

| RECEIPTS. | £ | s. | d. |
|---|---|---|---|
| Donations | 265 | 16 | 6 |
| Proceeds of Sale of Telescope | 10 | 0 | 0 |
| Deficit | 12 | 15 | 4 |
| | £288 | 11 | 10 |

| EXPENDITURE. | £ | s. | d. |
|---|---|---|---|
| Observatory Dome | 45 | 10 | 0 |
| Erecting Observatory | 158 | 0 | 6 |
| 8-day Sidereal Clock | 28 | 7 | 0 |
| Sundry Instruments | 22 | 12 | 5 |
| Honorarium to Architect | 15 | 15 | 0 |
| Setting up Telescope | 3 | 17 | 6 |
| Sundry Expenses, Stamps, Printing, etc. | 14 | 9 | 5 |
| | £288 | 11 | 10 |

*Examined with vouchers and accounts, and found correct.* { E. S. PAYNE, WALTER SCHRÖDER.

E. COMPSON CRUMP, *Hon. Treasurer.*
Hampstead, January 24th, 1910.

*The upkeep of the Observatory will probably increase the yearly expenditure by about £20. Members are asked kindly to bear this in mind when paying their subscriptions.*

# Observatory Fund.

DONATIONS.

| | £ | s | d |
|---|---|---|---|
| Abbott, Rev. Dr. .. .. | 2 | 2 | 0 |
| Allcock, Miss N. .. .. | 0 | 2 | 6 |
| Alcock, S. P. .. .. | 0 | 10 | 6 |
| Allen, A. J. .. .. | 0 | 5 | 0 |
| Allen, Mrs. C. H. .. .. | 1 | 1 | 0 |
| Anonymous .. .. | 5 | 0 | 0 |
| Atkin, G. D. .. .. | 1 | 1 | 0 |
| Avebury, Rt. Hon. Lord, F.R.S. .. .. | 2 | 2 | 0 |
| Baillie, J. R. .. .. | 10 | 0 | 0 |
| Baily, Walter .. .. | 10 | 0 | 0 |
| Bakewell, H. J. .. .. | 0 | 10 | 0 |
| Ball, Mrs. .. .. .. | 2 | 2 | 0 |
| Barham, Sir George, J.P. .. | 2 | 2 | 0 |
| Barratt, T. J. .. .. | 10 | 10 | 0 |
| Bartrum, C. O. .. .. | 3 | 3 | 0 |
| Bayliss, Dr. W. M., F.R.S. | 1 | 0 | 0 |
| Bell, Edward .. .. | 2 | 2 | 0 |
| Blyth, E. K. .. .. | 1 | 1 | 0 |
| Case, The Misses .. .. | 0 | 5 | 0 |
| Chandler, P. W. .. .. | 2 | 2 | 0 |
| Channing, F. C. .. .. | 1 | 1 | 0 |
| Clarke, Henry, J.P. .. | 10 | 10 | 0 |
| Coates, J. .. .. .. | 0 | 5 | 0 |
| Crump, E. Compson .. | 5 | 5 | 0 |
| Cunnington, Dr. C. W. .. | 1 | 1 | 0 |
| Curwen, H. B. .. .. | 5 | 5 | 0 |
| Curwen, T. C. .. .. | 0 | 10 | 0 |
| Darley, C. W., I.S.O. .. | 4 | 4 | 0 |
| Davis, R. R. .. .. | 1 | 1 | 0 |
| Debenham, Frank, J.P. .. | 5 | 0 | 0 |
| Duveen, Edward J. .. | 28 | 7 | 0 |
| Dyer, Dr. Bernard .. | 2 | 2 | 0 |
| Edgeworth, Professor F. Y. | 2 | 2 | 0 |
| Faraday, R. .. .. | 0 | 5 | 0 |
| Figgis, Samuel .. .. | 5 | 0 | 0 |
| Findon, Hugh .. .. | 1 | 1 | 0 |
| Fletcher, J. S., M.P. .. | 2 | 0 | 0 |
| Fox, Dr. Fortescue .. | 1 | 1 | 0 |
| Freuer, Miss .. .. | 0 | 10 | 0 |
| Grenfell, J. S. G. .. .. | 2 | 2 | 0 |
| Harben, Sir Henry .. | 5 | 0 | 0 |
| Heberden, H., Colonel, J.P. | 2 | 0 | 0 |
| Carried forward | £142 | 13 | 0 |

| | £ | s | d |
|---|---|---|---|
| Brought forward | £142 | 13 | 0 |
| Hickman, Lady .. .. | 2 | 2 | 0 |
| Holiday, Henry .. .. | 1 | 1 | 0 |
| Holland, Mrs. .. .. | 2 | 2 | 0 |
| Hopson, M. F. .. .. | 2 | 2 | 0 |
| Howard, F. G. .. .. | 1 | 1 | 0 |
| Hunt, E. J. .. .. | 0 | 10 | 6 |
| Hunter, J. W. .. .. | 0 | 5 | 0 |
| Hutchinson, Rev. H. Neville | 5 | 0 | 0 |
| Islington, Lord Bishop of .. | 2 | 2 | 0 |
| James, Miss .. .. | 1 | 1 | 0 |
| James, Leonard .. .. | 1 | 1 | 0 |
| Jealous, Mrs. G. S. .. | 1 | 1 | 0 |
| Johnston, Mrs. Chas. .. | 1 | 0 | 0 |
| Jolly, Mrs. E. E. .. .. | 2 | 2 | 0 |
| Jones, G. E. .. .. | 1 | 1 | 0 |
| King, Mrs. M. L. .. .. | 1 | 1 | 0 |
| Lever, W. H., M.P. .. | 5 | 5 | 0 |
| Lewis, John .. .. | 1 | 0 | 0 |
| Lister, Miss .. .. | 5 | 5 | 0 |
| Lister, I. S. .. .. | 1 | 1 | 0 |
| Lovell, Miss .. .. | 1 | 1 | 0 |
| McGregor, Mrs. .. .. | 0 | 10 | 0 |
| Mager, G. E. .. .. | 1 | 1 | 0 |
| Marnham, Herbert .. | 3 | 3 | 0 |
| Marshall, P. E. .. .. | 1 | 1 | 0 |
| Martelli, Mrs. .. .. | 0 | 10 | 0 |
| Martelli, Miss A. .. .. | 0 | 5 | 0 |
| Martelli, F. .. .. | 0 | 10 | 0 |
| Martin, Miss F. .. .. | 1 | 1 | 0 |
| Matheson, Miss .. .. | 1 | 1 | 0 |
| Moore, Mrs. .. .. | 1 | 1 | 0 |
| Moore, Miss M. E. .. .. | 0 | 10 | 6 |
| Mullins, W. E. .. .. | 0 | 10 | 0 |
| Ogden, Mrs. W. B. .. | 1 | 1 | 0 |
| Paine, W. W. .. .. | 1 | 1 | 0 |
| Palmer, J. L. .. .. | 2 | 2 | 0 |
| Palmer, J. .. .. | 2 | 2 | 0 |
| Park, Mrs. C. P. .. .. | 0 | 10 | 6 |
| Parker, Miss C. M. .. | 0 | 5 | 0 |
| Payne, E. S. .. .. | 2 | 2 | 0 |
| Carried forward | £201 | 4 | 6 |

## OBSERVATORY FUND—*continued.*

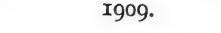
| | £ | s | d |
|---|---|---|---|
| Brought forward | 201 | 4 | 6 |
| Pearce, Mrs. Robert .. | 1 | 1 | 0 |
| Pooley, H. F. .. .. | 0 | 5 | 0 |
| Purry, Walter .. .. | 0 | 5 | 0 |
| Pusinelli, F. C. .. .. | 5 | 5 | 0 |
| Radcliffe, H. .. .. | 1 | 1 | 0 |
| Reed, E. Pye-Smith .. | 1 | 1 | 0 |
| Ridley, Miss .. .. | 3 | 3 | 0 |
| Roberts, F. G. Adair, J.P. | 5 | 0 | 0 |
| Rudler, F. W., I.S.O. .. | 1 | 1 | 0 |
| Russell, C. A., K.C. .. | 1 | 1 | 0 |
| Sanders, C. G. .. .. | 2 | 2 | 0 |
| Schröder, Walter .. .. | 5 | 5 | 0 |
| Stokes, A. W. .. .. | 1 | 1 | 0 |
| Strange, Miss .. .. | 0 | 10 | 6 |
| Strange, Dr. .. .. | 1 | 1 | 0 |
| Straube, A. .. .. | 1 | 1 | 0 |
| Suiter, Miss M. .. .. | 0 | 5 | 0 |
| Tiver, E. .. .. .. | 0 | 15 | 0 |
| Thompson, Dr. A. H. .. | 1 | 1 | 0 |
| Carried forward | £233 | 9 | 0 |

| | £ | s | d |
|---|---|---|---|
| Brought forward | £233 | 9 | 0 |
| Trewby, G. C. .. .. | 2 | 2 | 0 |
| Underdown, H. W. .. | 1 | 0 | 0 |
| Viner, Miss F. A. .. .. | 0 | 10 | 0 |
| Vizard, P. E. .. .. | 5 | 5 | 0 |
| Vizard, W. G. .. .. | 1 | 10 | 6 |
| Voysey, Rev. C. .. .. | 0 | 5 | 0 |
| Waghorn, J. .. .. | 1 | 1 | 0 |
| Wallis, Mr. and Mrs. E. .. | 1 | 1 | 0 |
| Weaver, F. P., J.P. .. | 3 | 3 | 0 |
| Wilks, Sir Samuel, F.R.S... | 10 | 10 | 0 |
| Wylie, R. W. .. .. | 10 | 0 | 0 |
| "A Friend," per Miss A. Martelli .. .. | 1 | 0 | 0 |
| | £270 | 16 | 6 |

N.B.—A donation of £5 included above was received while going to press.

# Abstract of Proceedings.

1909.



## General Meetings.

Friday, January 8th. Mr. P. E. Vizard, Vice-President, in the chair.

**Mr. C. O. Bartrum, B.Sc.,** Secretary of the Society, gave a lecture on **"Talking Machines, their History and Scientific Principles,"** illustrated with lantern and with a gramophone and an auxetophone lent by the Gramophone Company. The lecturer gave an elementary account of the mode of propagation of sound waves in the air; of the composition of musical notes and of complex sounds; and of the complex wave forms which, striking on the drum of the ear, are analysed by that organ into their components, giving the sensations of the different sources from which they have proceeded. To show that sound waves are objective realities and not merely mathematical abstractions, a photograph of a rifle bullet travelling at 2,000 feet per second and its accompanying sound waves was shown on the screen. This was taken by Mr. C. V. Boys, F.R.S., by the light of an electric spark as the bullet left the muzzle of the rifle.

The lecturer showed that the form of any sound wave could be expressed by means of a curve, and that any body constrained by mechanical means to vibrate according to such a curve would radiate the corresponding sound. He pointed out that the spiral groove on the records of the phonograph and the gramophone had the character of such a curve, and showed by lantern slides how the diaphragm of the instruments was forced to vibrate and so to radiate the wave forms recorded. To make the records a soft wax disc is used, and the spiral groove is cut in the wax with a sapphire cutter attached to the recording diaphragm, the speaker, singer, or player, being close to the collecting bell of the instrument. From the wax a copper negative is made by electro-deposition, and from the copper negative the commercial records are stamped in a material plastic when hot, but very hard and tough when cold. The chief difference between the phonograph and the gramophone lies in the fact that with the former the wave form

is cut into the record in an up and down direction, whereas with the latter the vibrations are made from side to side.

The defects still to be found seem to be (1) the scraping sound. This is probably due partly to the scraping sound which is made by the cutter when recording, the vibrations of which are probably recorded together with those of the principal sounds. Another defect (2) is the undue enforcement of the high partials of a note, causing an inclination to a nasal quality and to an increased harshness. This seems to be due to the sensitiveness of the diaphragm to tones of high frequency and to a modification of the sounds in passing through the horn of the instrument. The auxetophone is an instrument in which the diaphragm is replaced by a finely adjusted valve in the form of a grid. Through this valve air is driven by an air-pump worked with an electric motor. The degree of opening of the valve is controlled by a needle travelling in the groove of the record, much as with the gramophone. The vibratory movements thus imparted to the valve generate the sounds, which are sufficiently powerful to fill a large concert hall. The accuracy of the reproduction is at least as great as with the gramophone.

Among the scientific uses to which the phonograph and gramophone have been put has been the careful analysis of the sound waves recorded. Prof. Scripture, of Yale University, has made drawings of the vibrations recorded by speech and music, and some of his results were shown on the screen. It was shown that many consonants are not recorded, especially the sibilants s, z, and th, and the explosives b, p, t, d, and k. It was shown afterwards, when the instruments were played, that these consonants are seldom if ever to be heard. A short history of these instruments concluded the lecture, after which a selection of records was played in illustration of the various points of the lecture.

On Friday, February 5th, the Annual General Meeting was held under the chairmanship of Mr. P. E. Vizard, Vice-President. The Report of the Council and Statement of Accounts were read and adopted. The President, Vice-Presidents, and other Officers and Council were elected.

The meeting was resolved into an ordinary meeting, Dr. F. Womack, M.B., B.Sc., presiding.

**Professor Harold A. Wilson, M.A., D.Sc., F.R.S.,** gave a lecture on **"Modern Views on Matter,"** illustrated with experiments. It was customary, the lecturer said, for unknown things

to be interpreted in terms of further unknown things, the number of unknowns being thereby reduced. So matter was coming to be explained in terms of electricity, itself an unknown. The falling of bodies had long been explained as due to gravity; but gravity was unexplained. One of the fundamental properties of matter—inertia, that property in virtue of which force and time were required to set it in motion or to bring it to rest—was now believed to be identical with magnetic inertia. The lecturer illustrated the principle of inertia by means of a heavy gyroscope. He then showed that when an electric current is passed through a vacuum tube, particles negatively charged are projected at great velocity from the negative pole or kathode, a luminosity being caused at the surface of the glass where they strike. That these particles actually travel through the tube was shown by the shadow cast by an object interposed in their path. These kathode rays of Crookes have been shown by Sir Joseph J. Thomson to consist of particles far smaller than atoms, and have been called by him electrons. Any form of matter is capable of yielding electrons. By a number of experiments the lecturer showed that when a magnet is brought near the stream of electrons, the stream is deflected in a direction at right angles to the direction of the magnetic force, much as the gyroscope was deflected at right angles to a force impressed upon it. An electric current, in fact, is a magnet, and the energy required to produce a current is the energy required to produce the magnetic field of force.

The hypothesis that matter consists of atoms has been found necessary to explain the chemical properties of matter. It is now found that atoms consist wholly, or in part, of smaller particles—electrons, which appear to be units of negative electricity. When the particles of a body are set in vibration by heat, light is emitted. Now light is known to be an electric vibration, and there seems every reason to suppose that light is due to the vibrations of electrons.

An hypothetical constitution of the atom, on the assumption that it consists of electrons, has been propounded by Sir J. J. Thomson, which goes some way to account for the periodic law of chemistry. When the atoms of the chemical elements are arranged in the order of their weight, it is well known that they fall into groups or periods, at corresponding phases of which occur atoms having similar chemical properties. Thomson supposes an atom to consist of a sphere of positive electricity, in the interior of which are a definite number of negative electrons. The latter will necessarily be attracted towards the centre of the positive

sphere, but repelled by one another. The lecturer illustrated this by floating a number of magnetized needles through pieces of cork in a vessel of water. The needles were placed vertically, with similar poles similarly directed. They therefore repelled one another, but were all attracted towards a centre by a magnet placed under the vessel. It was shown that, under these circumstances, when the number of needles was few they took up positions in a ring; but that as the number was increased, successive rings were formed inside one another. In a similar way Sir J. J. Thomson supposes the structure of the atom, upon which the chemical properties depend, to pass through successive periods as the number of electrons contained, and thereby the weight of the atom, is increased.

Dr. Wilson finally showed by experiment that a flame discharges negatively charged particles towards a positively charged body.

Friday, March 5th. Dr. F. Womack, M.B., B.Sc., in the chair.

**Mr. Percy J. Harding, M.A.,** gave a lecture entitled "**Division according to Cocker; a Chapter from the History of Arithmetic,**" illustrated with lantern slides. Edward Cocker, the lecturer said, was a professional writing master, who lived in the seventeenth century, during the times of Cromwell and Charles II. He added arithmetic to the subject of writing, as was customary in those days. He is interesting as having first made popular our present day method of working long division sums. Portraits of him were thrown on the screen. Writing was not a common accomplishment in those days, being confined almost entirely to the clergy. When the unlearned class took to writing, it was taught in a very serious manner by men who made a speciality of it. Arithmetic was generally taught by the same men for the sake of convenience. On the other hand, the better educated class confined themselves mostly to the classics and never learned arithmetic, considering it suitable only for business men.

The lecturer then gave an account of the way in which the practice of arithmetic spread from the East into Europe. The Hindoos had much the same method in use as we have now. They had symbols, probably derived from the Sanskrit, to indicate the different numbers, and they worked on the decimal system. A most important invention which we owe to them is the cipher to denote "nothing." This gradually spread through the Persians and Arabians, following the course of the development of commerce, into Italy. It is said to have been introduced by Leonard of Pisa in 1202. Meantime, in Europe, the usual way of calculating

was by means of boards and counters. On the boards were lines, the lowest representing units, the next above tens, the third hundreds, and so on, working upwards. As many counters were placed on each line as were needed for the required number, and a counter placed between the lines represented five counters on the line next below. This calculating board was gradually superseded by the Arabic notation, which is now in use. The struggle between these two systems was illustrated by throwing on the screen a print taken from an old arithmetic book, showing two men sitting side by side working each on his own method.

With regard to division in arithmetic, which was the chief subject of the lecture, Mr. Harding showed that the modern method of working had only been in general use since the time of Cocker. The Hindoos had worked their long division sums by repeatedly subtracting the divisor, doing this from left to right, instead of from right to left as we do now. They worked in sand and erased every figure that was done with as they went along. The Arabians copied their method, but, as they used tablets and not sand, they scratched through their figures instead of erasing them. This system of division continued in England until Cocker's time, and can be seen in many of the earlier arithmetic books. Edward Cocker and his contemporary, James Hodder, were writing masters, who kept rival schools for the teaching of writing and arithmetic. They were both popular at the time, but Cocker is noted for having used the modern method of division, whereas Hodder kept to the old "' scratch division " as it is called. Pepys in his celebrated Diary mentions going to visit Cocker ; and Boswell tells us how Dr. Johnson gave a copy of Cocker's Arithmetic book as a tip to a servant girl in the Highlands.

The lecture was illustrated by many lantern views. There were shown portraits of some of the great arithmeticians ; sample pages of woodcuts which illustrated old arithmetic books, English, German and Italian ; pages from some of Cocker's copy-books, which were ornamented by wonderful designs in scroll-work ; and also examples of sums done on the old scratch method. Dr. Womack also illustrated the lecture by working sums by this method at the lantern.

On Friday, April 2nd, a special meeting was held to consider the proposal to establish an Astronomical Observatory and Meteorological Station, Mr. P. E. Vizard, Vice-President, in the chair. The proposal was unanimously approved.

The meeting was resolved into an ordinary meeting, when

**Dr. Arthur J. Hubbard** gave a lecture on **"Prehistoric Man on the Cotswold Hills,"** illustrated with lantern slides. The lecturer dealt with the recent discoveries made by his brother and himself in the cities inhabited by men of the Neolithic Period. No answer had been hitherto given, he said, to the question where the men dwelt who made the stupendous earthworks left by prehistoric man. From the size of these works it was evident that the workers must have been very numerous. The area covered by the remains of their cities was proportionately large, one of them specially investigated being two to three miles long by three quarters of a mile broad. The remains were those of a people who only considered their safety and the primitive necessities of life.

The centre of the lecturer's observations was Willersey Hill, halfway between Campden and Broadway. The top of these hills is scarped, partly by nature, but largely by artificial means. The summit is always a level plateau, protected by defensive embankments where there is no scarp, and was used as the herding-place for cattle. Below the scarp is a large extent of ground, with a surface presenting an appearance to which the lecturer had given the name of "crumpled ground." It is untilled, but not in its natural condition. There is no arrangement at first apparent in the mounds and depressions (sometimes twenty to thirty feet deep) covering this "crumpled ground." These depressions were found to constitute the dwellings.

Evidence to this effect was found. The "crumpled ground" is always (except when within the plateau on the top of the hills) in a protected position, and in association with neolithic works. It is traversed by "cattleways" from the summit to the plain, but these never enter the depressions, which are occasionally protected by "wolf platforms," in two or three rows. Stones burnt right through were found on the surface in profusion. On sinking a hole three and a half feet deep in the centre of an oval depression measuring sixty feet by forty, there were found first two feet of dark humus, and then stones packed in yellow marl. Burnt stones were found down to three feet. At two feet was found red pottery, then bones, then black pottery, then flat burnt stones, evidently hearth-stones, with charcoal still adhering to them, and finally a piece of a red deer's antler. Similar results were obtained from digging in other pits. The depressions in their arrangement resemble a Chinese house, in which there is a central room with others built round it.

Alleys or roads were found running amongst them, to which the lecturer gave the name of "curved ways." These are always curved and slightly raised; their course can be traced from the hill above. They begin in the topmost pits and run in a semi-circle, with a diameter of about one hundred yards, curving up again amongst the depressions until they are lost where these end. The "curved ways" are about two feet six inches wide, and on cutting through the humus it was found that they had a pavement of slabs of oölite stone close-set on edge, and bonded like a brick floor. At their side is a ditch to carry off surface water.

There was evidence that considerable care was taken in keeping the dwellings dry, as their entrance was always at the lowest point of the circumference, and they were protected from water pouring down the hill by immense mounds which must have served as dams until the water percolated into the ground.

It was suggested that this great ring of habitations served as a defence for the cattle against wolves. In their exposed position on the sides of the hills, these pit dwellings formed an effectual protection against the wind. Amongst a pastoral people, hides must have been plentiful, and it was suggested that the pits were roofed over with that material. Traces of the dwelling combining the burrow and the tent are still to be found in Iceland and China.

With these primitive people an infinitude of labour took the place of skill in their vast works. In spite of the destruction of centuries of ploughing, there is still a great extent of "crumpled ground" all along the Cotswolds. Dr. Hubbard estimated that the present population of the district is not one hundredth part of what it was in neolithic times.

**Mr. George Hubbard, F.S.A., F.R.I.B.A.,** then gave a lecture on **Crockern Tor, Dartmoor, a Prehistoric Seat of Parliament.** The lecturer pointed out that in all archæological research the investigator had to approach his subject with an unbiassed mind, and that the imagination had to play an important part if a solution was to be found of the evidences of prehistoric man's works. In short, the archæologist had to work from the known to the unknown, or from the historic to the prehistoric, and that work required an unbiassed imagination. By the application of this method of enquiry to Crockern Tor, Mr. Hubbard considered, much presumptive evidence could be adduced to show that during a prehistoric Celtic period Crockern Tor may very probably have been a seat of Parliament.

Great tracts of Dartmoor are now uninhabited ; but in prehistoric times the Moor had scattered villages upon it, as is evidenced by the collection of scores of hut circles, which are chiefly to be found in the immediate neighbourhood of the ancient Phœnician tin-workings. At that period man was probably emerging from the Stone Age into the Bronze Age.

On Dartmoor are many outcrops of granite which may be seen standing out against the skyline like great castles on the horizon. These granite outcrops, known as Tors, named after the great god "Thor," would strongly appeal to a primitive mind, for great expanses of the Moor may be seen from their summits, and they are landmarks for miles around.

None of the Tors appear to have any evidence of man's labour upon them excepting Crockern Tor, and in this respect it appears to be singled out from all the others. On Crockern Tor a curious ceremony was held, until so late a date as about the middle of the eighteenth century.

At this time Crockern Tor must have been miles away from any habitation ; but still people appear to have collected here from time immemorial, to hold their Stannary Courts. The Stannary Courts were concerned in maintaining the purity of the standard of tin. No modern community would select such a bleak and windswept height for holding a Court ; but th fact that it was so used about a hundred and fifty years ago is strong evidence of the force of tradition.

From Rowe's "Perambulations of Dartmoor," it appears that a certain Richard Strode, a member of Parliament for Plympton, was tried in 1512 at Crockern Tor, and sentenced to imprisonment by the Stannators, showing this to have been an important Court at that time.

By a reference to a Map of Dartmoor and the surrounding districts, it will be seen that there are two main roads only which cut across Dartmoor. These roads cross each other near Crockern Tor. There exists also the remains of an ancient trackway, leading to, and terminating at, Crockern Tor. This fact certainly points to Crockern Tor as being a spot where in prehistoric times men congregated.

The great rocks themselves show what Prince recorded in 1697, when he said that "this memorable place is only a great rock of moorstone out of which a table and seats are hewn."

Mr. Hubbard visited Crockern Tor (1908). He described and shewed by lantern slides that the rock had been roughly hewn into steps or seats, advantage having been taken of the natural

jointing of the granite. There is a local tradition about a Judge's chair which stood on the summit of Crockern Tor. This appears to have been removed about the year 1815, and in a wall at Dunnerbridge Farm, some two miles away from Crockern Tor, there exists a great stone seat with a stone canopy above it, which is referred to by the inhabitants as the Judge's Chair.

Around a portion of the summit of Crockern Tor massive rocks appear to have been deliberately built into the ground, forming a retaining wall; the rocks of this walling are certainly not placed as nature would have deposited them.

In Isaac Taylor's "Words and Places" the word "Crockern" is stated as being the same as the Welsh verb "Gragan," meaning "to talk aloud," from which the English verbs to "croak" or to "creak" are derived.

It therefore seems probable that from these rough-hewn seats, a Celtic race in prehistoric times talked aloud. It was their croaking place, or talking place, or Parliament.

Wistman's Woods are quite close to Crockern Tor. There are no woods there now; but the name survives and "Wistman," according to Isaac Taylor, means "Wise men." Here the wise men lived, and on Crockern Tor they taked aloud.

The evidence seemed strongly to indicate that perhaps for over 3,000 years men had congregated here; first perhaps to make laws, and afterwards to administer them. It seems unlikely that, if the continuity had ceased at any time, men should have returned to its elevated and exposed position. Nothing short of the strong binding force of tradition could have induced men to continue the holding of their meetings on this desolate and elevated outcrop of granite.

With all the tradition supported by so much evidence, it seems extraordinary that this Parliament rock should be allowed to be worked by a local Borough Council of wiseacres as a convenient quarry for road metal; but the last Mr. Hubbard saw of Crockern Tor was a body of men breaking up the stones at its base into so many yards of road metal. Mr. Hubbard explained the action he had taken to preserve the rocks from further demolition, and he hoped that he may have succeeded in doing something to preserve them.

Destruction was also in progress of the stone alignments and stone circles on Dartmoor, the material being used for road metal and for gate posts.

All Dartmoor is a priceless heritage which is neither understood by those who own it nor by those who control it. Mr.

Hubbard wished that all Dartmoor could be preserved intact for all time. Now that a Royal Commission had been formed to report upon the Historical Monuments of the country, he trusted that at least these most interesting prehistorical monuments should not be considered as falling outside its protecting influence.

Friday, May 7th. Mr. P. E. Vizard, Vice-President, in the chair.

**Mr. F. W. Rudler, I.S.O., F.G.S.,** Vice-President, gave a lecture on **Volcanoes,** illustrated with the lantern. The lecturer began by briefly referring to the Messina earthquake of Dec. 1908, and said that, though it had constantly been suggested that earthquakes and volcanic phenomena were connected, and though both may possibly have a common cause, nevertheless no direct relation had been proved by recent observations made in Italy or Japan. After describing the volcanic area to the west of Southern Italy, and pointing out that earth disturbances take place along certain lines, and that the chief volcanic centres are often situated where two such lines cross one another, the lecturer gave a detailed description of Mount Etna, which is so situated, dwelling especially on the formation of parasitic cones which break out on the side of the mountain, it being easier for the lava to find egress there than to rise to the mountain top. This he illustrated with slides of the Monti Sylvestri, which resulted from the last great eruption of 1892, which the lecturer had himself seen and investigated. Attention was next directed to the Lipari or Æolian Islands, especially to Panaria, which is part of a large old volcano, situated at the junction of two lines of disturbance; and to Stromboli, sometimes called the Fisherman's Barometer and the lighthouse of the Mediterranean, since it is slightly more active with a low barometer, and has been continually in action for twenty centuries. The crater of Stromboli can be safely watched; its action consists usually in the emission of successive puffs of steam which rise through the molten lava in the crater. Vesuvius was then described and the story told of its eruption in A.D. 79, generally called the Plinian Eruption, which destroyed Herculaneum and Pompeii. Pompeii, some miles from the mountain, was overwhelmed by volcanic dust, probably in a more or less damp state. Herculaneum, which is nearer Vesuvius, was buried under stiff volcanic mud, and more recent lava has flowed over that. It is therefore more difficult to excavate than Pompeii. The lecturer then referred to the violent outburst of Vesuvius in 1906, with discharges, not

only of lava, but of immense volumes of volcanic ash, some of which became marked by ridges due to sliding. Other eruptions described were those of St. Vincent and Martinique in 1902, the destruction caused by these being largely due to the downward course taken by the hot ejected dust and gases; and that of Krakatoa in 1883, which was heard in Australia and in Ceylon. It was pointed out that the section of Rakata, which was exposed after the northern part of Krakatoa had been blown away, revealed in an exceptional manner the inner structure of a volcano and tended to confirm the "crater of eruption" theory. According to this view, a volcanic mountain is built up of materials ejected from the interior of the earth, and is not due to local inflation of the crust by subterranean forces. The various hypotheses which have been advanced to explain the origin of the earth's internal heat were briefly discussed. Volcanoes are probably fed, not from any central source, but from local reservoirs of magma in a comparatively shallow part of the crust. It has been supposed that the heat for local fusion may be due to chemical or mechanical action, or to the radio activity of the rocks. The Hon. R. J. Strutt has shown that the average amount of radium in the rocks would supply sufficient heat to maintain the present thermal condition of the earth, if the crust were only about forty-five miles thick, with no radium below; but Prof. Joly holds that sufficient elevation of temperature near the surface for volcanic phenomena could not be obtained by any increased local radio activity of the rocks, unless of an order higher than seems probable from recorded observations. Reference was also made to the origin of vulcanism on the planetesimal theory of the earth's formation, as suggested by Professors Chamberlin and Moulton of Chicago, and to the opinion of Prof. Arrhenius of Stockholm, according to whom the interior of the earth is mainly composed of gases—not gases as we know them, for, at the pressures and temperatures there existing, they would have a rigidity equal to that of steel. It should be remembered that volcanoes eject far more gases than anything else, and their action may be roughly compared to that of a bottle of soda-water when uncorked, for in both a release of pressure causes the pent-up gases to expand and rush out of the orifice, carrying some of the surrounding liquid with them. But, after all that has been written, it may be said that the real cause of volcanic action remains without satisfactory explanation.

On Thursday, October 28th, the Annual Conversazione was held to inaugurate the Session 1909-10. Mr. Walter Baily,

Vice-President, and Mrs. Baily received the members and their friends.

**Professor W. M. Flinders Petrie, F.R.S.,** Vice-President, gave a lecture on **"Egyptian Art,"** illustrated with lantern slides. There was, he said, a good deal of misapprehension with regard to what was real Egyptian Art. The best work was certainly that of the earliest periods; but what was commonly shown as Egyptian Art was of much later date and was very inferior to the earlier work. The lecturer then pictured and described a large number of works of statuary, relief, painting, and jewellery, representing the period from about 4500 B.C., to the time of the eighteenth and nineteenth dynasties, three thousand years later. Some of the earliest examples were very fine in conception and execution, and, speaking generally, the later specimens showed a great deterioration. And yet, said the lecturer, the latter were what were usually put before the public as Egyptian Art. They were really a travesty of the very worst period.

After the lecture Dr. Reginald S. Clay gave a demonstration of the Optical Projection of Crystals by Polarized Light, and refreshments were served. A collection of scientific exhibits were on view. A programme of music was performed during the evening.

Friday, December 3rd. Mr. P. E. Vizard, Vice-President, in the chair.

**Professor W. Boyd Dawkins, M.A., D.Sc., F.R.S.,** gave a lecture on **"John Richard Green at Oxford."** The lecturer said that in dealing with John Richard Green there was no need for him to say anything of the position he held as historian of the English people. He was the very first man in this country—and he (the lecturer) might almost say in Europe—who attempted to give the history of a nation from the point of view of the people. They all knew Green's public work; but few knew of John Richard Green in the making. About fifty years ago Green and he were at Oxford together, and for three years they lived on terms of the closest intimacy, from which began a lifelong friendship. From those years of intimacy he was able to become acquainted with the character and qualities of Green, and he treasured also numerous letters which Green wrote to him in his early days, and which even then made him realize what a man of worth and genius his friend was. Green gained a scholarship at Jesus College, Oxford, the Welsh College. When he (the lecturer) went to that college,

in 1857, Green and one tutor were the only two Englishmen there. Being a youth of extremely strong social instincts, and also of considerable humour, Green rapidly became very popular; but when the lecturer went to college he found that Green had fallen from his popularity because of a very simple thing. A party of young men at the college—there were always some who thought themselves better than others—had taken command of one of the tables in hall, and kept it to themselves. This Green resented, and wrote one of the most biting lampoons on the subject. For that he had been sent "to Coventry." After speaking briefly of Green's continuous struggle against an incurable disease, the lecturer went on to describe the Oxford of fifty years ago—a very different thing to what it is to-day—and to speak of its influences upon the future historian. These were actually very slight, because in Green they had a man who passed through Oxford with very little of the Oxford spirit; but the fact that he went through a college in which nearly all were Welshmen was of great advantage to him later, when he came to write his book. He (the lecturer) was of opinion that the Welsh part was the prettiest part of the book. The lecturer then proceeded to read some of the lengthy epistles of Green to himself, showing the writer's wonderful versatility, his immediate grasp of all things, his delightful humour, and, even then, his masterly "style." Some portraits of the historian were also shown by means of the lantern.

The Society is indebted to the Editor of *The Hampstead and Highgate Express* for assistance in reporting the above meetings.

# Natural History Section.

Committee (for the Section and the Field meetings), Mrs. P. L. Forbes, Mrs. Park, S. P. Alcock, H. Pace, Hugh Findon, F.L.S. (Hon. Secretary).

The work of the Section is, on the whole, very satisfactory, though no member has at present come forward to arrange the Beach Collection of Mosses; neither have any specimens been placed in the Society's entomological cabinet. This last, however, is partly owing to the bad season for all branches of Natural History collecting.

Various members have made exhibits for the first time during the year, and the discussion of the papers has been more general. The attendances has been greater.

The Elementary Class of Zoology began in December, and the attendance was very gratifying.

Seven meetings were held in 1909 at Stanfield House as follows:—

Friday, January 15th. Mr. P. E. Vizard, Vice-President, in the chair.

Miss Homfray exhibited Natural Balls formed from the fibres of *Posidonia caulina* by wind and waves on the coast of the Riviera.

Mrs. Park exhibited the same from the fibres of *Posidonia australis* from the Australian coast.

Miss A. Martelli exhibited Fire-Sticks still used by the natives of North Australia.

Miss Garlick exhibited Prayer Beads, the seeds of *Abrus precatorius*, Order Leguminacæ, from India.

**Mr. Herbert Goodchild, M.B.O.U.,** read a paper on **"Disappearing British Birds."** The paper first dealt with the probable character of primæval Britain as forest land interspersed with heaths and marshes in the south, and to the north and west uplands, moors, and mountains. The appearance of Hampstead and the Brent valley five thousand years ago was drawn in detail. The birds likely to be seen and heard throughout this tract were the buzzard, raven, hobby, kite, honey buzzard, and others, and were now on the verge of extinction. Lantern slides of most of the birds mentioned were shown.

A discussion followed in which Mr. Palmer was able to show that in Ireland one case at least was known where landowners were doing all they could to protect the birds that visited their estates to breed.

Mr. Goodchild laid on the table a series of coloured plates of the various species of birds of which he had spoken.

Friday, February 12th. Mr. A. Clement Cooke in the chair.

Mrs. Park exhibited a hollow crystal of Chalcedony containing liquid, and known as a Water Stone, from Peru.

Mr. Geo. P. Wight exhibited a smaller specimen, and a fragment showing internal markings.

Mr. Hugh Findon, F.L.S., exhibited Miocene Mullusca from various parts of France.

Mr. James Burton exhibited under his microscope a section of Marram Grass (*Psamma arenaria*) from the sea shore, Isle of Man, showing Xerophilous structure.

**Mr. C. S. Nicholson, F.L.S.,** a former member, read a paper on **"The Xerophilous Flora of Southern Spain."** Spain might be divided into three tracts, the third of which, comprising the southern provinces, sloped from the central tableland to sea level. Here from April to September was uninterrupted drought: the annual rainfall being below fifteen inches. Vegetable growth was necessarily crowded into a very short period, nevertheless an extensive flora existed. Eleven hundred species were found in this division of which one half were annuals. Mr. Nicholson found but seven common British plants. On his arrival at Aguilas there were no turf and no trees save a few palms and eucalyptus. Soon afterwards there was a heavy rainfall for one day, when an exuberant growth appeared, completely changing the appearance of the country. The plants, however, were characteristically modified for a desert habitat.

The plants collected during his visit were exhibited to the members.

Friday, March 12th. Mr. G. E. Jones in the chair.

**Mr. A. D. Darbishire, M.A.,** gave a discourse on **Mendelism,** illustrated by diagrams on the black-board and cases of specimens of garden peas.

Having recounted the results obtained by Mendel in crossing certain varieties of peas, published by him in 1865, Mr. Darbishire proceeded to describe the results obtained by various persons after the republications of Mendel's paper in 1901.

Experiments had been made not only with peas but with other plants, and also with mice, snails and fowls.

The results of these experiments all confirmed Mendel's observations, and the theory deducible from them might be stated thus :—

Of the characteristics of two dissimilar parents, those that appeared in the first generation were termed "dominant," while those that disappear in the first to appear in a portion of the second were termed "recessive."

The offspring in the first generation were all of the dominant character.

The offspring in the second generation were one quarter of recessive character, and three quarters of dominant character.

Of those of the dominant character in the second generation, one third were true breeding, and two thirds were hybrids as those of the first generation.

Friday, April 16th. Mr. F. C. Channing, F.L.S., in the chair.

Mr. James E. Whiting exhibited a Tree Creeper (*Certhia familiaris*), a Little Owl (*Strix passerina*), a Yellow Wagtail (*Motacilla flava*), and a Green Woodpecker (*Picus viridis*).

Mr. Herbert Goodchild, M.B.O.U., exhibited Bird Skulls, and three drawings illustrating classification by palate.

Mr. Hugh Findon, F.L.S., exhibited the Larva of the Leopard Moth and its boring in a Rowan Tree, and a piece of old timber with borings of the Death Watch Beetle (*Amobium*).

**Mr. Geo. P. Wight** read a paper entitled **"Notes on some Gymnospermous Trees, their Distribution and Range in time,"** illustrated by the lantern, with photographs chiefly taken from "Veitch's Manual of Conifers."

He emphasised the importance of the group, and spoke chiefly on the lesser known genera of the Taxaceæ and the Pinaceæ.

Amongst others were mentioned the Maidenhair-Pine (*Ginkgo biloba*); the Sequoia, a big tree of California; the Araucaria or Monkey Puzzle; and the Cedar of Lebanon.

The study of Gymnospermous trees tended to confirm the view that the lands within the Arctic circle were a centre of plant distribution in earlier times.

There was some discussion afterwards, Mr. Wight replying.

Friday, May 14th, at 7.30. Mr. P. E. Vizard in the chair.

Tea and coffee was served during the evening.

**Miss Eckenstein** gave a lecture on **"Sinai and its Peoples."** illustrated by lantern slides.

**Mr. James Burton** gave a demonstration on **Fresh Water Algae.**

There was a large attendance of members and friends.

The meeting then adjourned until November.

Friday, November 12th, at 8.30 p.m. Mr. G. E. Jones in the chair.

Mrs. Park exhibited Jurassic fossils; the result of five days' search near Bridport, Dorset.

Mr. Hugh Findon, F.L.S., exhibited *Littorina littorea* from old turf near Camden Road, apparently having become partially fossilised.

**Mr. Bristow J. Tully, F.G.S.,** read a paper on "**Pearls**" illustrated by specimens of Pearls and Pearl Shells.

The paper dealt with their History, Cultivation and Natural History; also the growth and structure of Pearl Shells and the commerce in Pearls and Mother-of-Pearl.

There was some discussion at the close of the paper in which Mr. Tully, Mr. Channing, Mr. Radcliffe, Mr. Purry and Mr. Findon took part.

Friday, December 10th. Mr. P. E. Vizard, Vice-President, in the chair.

Mr. Herbert Goodchild exhibited, on behalf of Mr. James E. Whiting, a Female Sparrow Hawk (*Accipiter nisus* Linné) and a Tawny, Brown or Wood Owl (*Syrnium aluco* Linné), both of Hampstead.

Mr. Albert Hinderlich exhibited pupæ of the large and small White Butterflies, and of a Noctinal Moth, all taken in Hampstead, which it was proposed to rear for the Society's collection.

**Mr. W. G. Snowden Gard, LL.B.,** read a paper entitled "**The Making of the Isle of Wight,**" which he illustrated by a map of the island and neighbouring coasts, and by diagrams showing the contortions in the strata of the island extending to the Weald.

The main portion of the paper was occupied with the denudation of the strata by rivers as connected with the scenery, and the latter part showed how the Frome River was the agent by which separation was effected.

Mr. Wintour Gwinnell, B.Sc., F.G.S., a visitor, amplified the remarks by the lecturer concerning the Frome and Solent. He said the source was probably in Lundy Island, and the course through Spithead, along the coast of Sussex, through the Straits of Dover and the North Sea, and discharging near the Shetlands.

The first meeting of the Systematic Class of Elementary Zoology, conducted by Dr. F. O'Brien Ellison, took place in the

Old Lecture Hall at Stanfield House on Friday, December 10th, at 7.45 p.m.

Nineteen students signed the Roll Book.

Dr. Ellison dealt with Animalcules, Sponges, Jellyfishes and Sea Anemones.

Diagrams of the structure of these and allied forms were shown by means of the lantern.

Preserved specimens and living animalcules under the microscope were exhibited.

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## Astronomical Section.

A class for the more systematic study of the Science was held on alternate Tuesdays in January, February and March, and was conducted by Mr. P. E. Vizard, F.R.A.S. Lockyer's "Elementary Lessons in Astronomy" was the text-book used.

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## Photographic Section.

COMMITTEE FOR 1909.

Miss Homfray, H. B. Curwen, A. Denman Jones (Hon. Sec. "A" Portfolio), B. Park, Dr. H. Roger-Smith, R. W. Wylie, and H. Nevil Smart (Hon. Sec. "B" Portfolio and Section).

The average attendance at the meetings, exclusive of the Exhibitions, was somewhat less this year than last.

A joint outdoor meeting of the Natural History and Photographic Sections was held at Denham on June 26th and proved a success, both from the photographic and social point of view.

The experiment of holding the Annual Exhibition in January was satisfactory as far as the number of exhibits sent in was concerned, but, owing to the dense fog during the two days of the Exhibition, the attendance was poor and the Committee resolved to revert back to December. For this reason there were two Exhibitions during the year.

At the Exhibition held in January, the Judge, F. J. Mortimer, Esq., F.R.P.S., found the average quality of the prints high.

The Silver Medal was awarded to H. Nevil Smart for his picture, "The Custom House, Venice." The Bronze Medal was won by the same worker for "A Silhouette," but as the rules do not permit the same competitor to take both medals, it was awarded to Dr. H. Roger-Smith for his "View from Arosa," a fine Alpine study.

Certificates were also won by Dr. A. B. Cubley, Frank Buszard, B. Flatau, G. Mager, H. Nevil Smart, Dr. H. Roger-Smith.

Other pictures worthy of note were exhibited by H. B. Curwen, R. Hart Prance, R. W. Wylie, B. Flatau, Miss Turck, Dr. A. B. Cubley, E. Staniland Pugh, H. Nevil Smart, E. Musmann. The Judge remarked that "Mr. O. C. Quekett's photographic copies of engravings are remarkable for their fidelity to the originals, and, as examples of specialised technical work, would be hard to beat."

For the first time in the history of the Society, the catalogues of the Exhibition were printed.

At the Exhibition held in December, the Judge, F. J. Mortimer, Esq., F.R.P.S., favourably commented on the general levelling up of the pictorial work exhibited. The Silver Medal fell to A. S. Jacobs for his picture "At Rest," while E. Musmann was awarded the Bronze for "Etaples."

Certificates were gained by E. Musmann, Dr. A. B. Cubley, F. Buszard, Dr. H. Roger-Smith, A. Denman Jones, O. C. Quekett, H. Nevil Smart.

At each Exhibition a special certificate was awarded to Dr. H. Roger-Smith for his examples of Autochrome work.

As an instance of the progress made by the Section, it is interesting to note that the number of exhibits sent in to the Annual Exhibitions has nearly doubled within the last three years.

An interesting feature of the December Exhibition was the inclusion of twenty photogravures of "London" by Alvin Langdon Coburn.

The circulating portfolios continue to do useful work.

Mr. H. B. Curwen resigned the Hon. Secretaryship of the "A" Portfolio, Mr. A. Denman Jones filling his place.

Mr. E. Staniland Pugh, one of the keenest workers in the Section, having left Hampstead, has resigned the Hon. Secretaryship of the "B" Portfolio, which is now carried on by the Hon. Secretary of the Section.

The following meetings were held during the year :—

Wed. Jan. 13. Hints on Pictorial Work, by Bertram Park.
Wed. Jan. 27.—
Thurs. Jan. 28. } Annual Exhibition.
Wed. Feb. 10.—Annual Lantern Slide Competition.

Wed. Feb. 24.—Demonstration, "Colour Photography," by Dr. H. Roger-Smith.
Wed. March 10.—Demonstration, "Development Simplified," by H. Nevil Smart.
Wed. March 24.—Holiday Papers:
1. Some Celtic Monuments, by H. B. Curwen.
2. Ten Days Climbing in the Bernina Alps, by Dr. H. Roger-Smith.
Wed. April 24.—"A talk about Home Portraiture," by Dr. C. F. T. Blyth.
Mon. Oct. 25.—Meeting at New Gallery, Royal Photographic Society's Exhibition.
Wed. Nov. 10.—Election of Officers and Beginners' Evening.
Wed. Nov. 24.—Holiday Papers. "Old Provence." R. W. Wylie,
Wed. Dec. 8. } Annual Exhibition.
Thurs. Dec. 9. }

## Vacation Meetings.

A meeting was held each month from May to October, 1909. These proved very enjoyable, and were mostly well attended. It is hoped, however, more members will find it convenient to take part in those to be arranged for the forthcoming season.

Saturday, May 22nd.—Members proceeded to Chorley Wood Station, and were conducted by Mr. James E. Whiting over Chorley Wood Common to Latimer. Tea was taken at Latimer Bottom, and the return journey was made from Chalfont Road.

Saturday, June 26th.—This meeting was held at Denham, Bucks., and was specially arranged for members of the Photographic Section to join the party. There was a good attendance. Those with cameras mostly remained in the vicinity of the village and obtained many excellent views. Others of the party rambled farther afield along the banks of the Misbourne and Grand Junction Canal. Botanists were able to make many additions to their collections.

Saturday, July 24th.—Kew Gardens. Members were joined by Prof. J. R. Drummond, F.L.S., and his son, who conducted the party through the gardens, first drawing attention to the Gingko, and afterwards visiting one of the fern houses, No. 4 Conservatory, No. 5 House and the Rock Garden. After tea, the party were again joined by their guides and conducted through the Temperate House. The party returned by the river bank, and spent a short time visiting the remains of the old fishing hamlet, Strand-on-Green.

Saturday, August 28th.—Members met at Holborn Viaduct Station, and proceeded to Otford, Kent. The party on leaving

the station ascended Otford Mount, the highest point being about 670 feet above sea level, continuing the walk over the North Downs, crossing the Pilgrims' Road to Kemsing Church and village. In the evening the hamlet of Noah's Ark was passed on the way to Kemsing Station.

Saturday, September 25th.—A visit to a tract of woodland lying between Chigwell Row and Lambourne End in Essex, the last remnant of the great Forest of Hainault. The land has now been preserved for the people.

During the afternoon Mr. Hugh Findon, F.L.S., gave a short account of the history of the Forest and its surroundings.

On account of the unpromising aspect of the weather during the morning, only a very few members were present, but a desire has been expressed that the excursion should be repeated during the forthcoming summer.

Saturday, October 16th.—A meeting was held at the Tower of London. By the courtesy of the governor, Major Gen. Pipon, a yeoman warder was deputed to conduct the party through the buildings. After first being shown the place where Ann Boleyn was beheaded, the following places were visited :—The basement of the White Tower, to the dungeon under the Crypt of St. John's Chapel; The Armoury, under the Tower where the young princes were smothered and the Duke of Clarence drowned in Malmsey wine; the water gate and south side of the White Tower: a brief summary of the history of these places, also the Bell Tower, being given by the guide. The Jewel Room was next inspected, and afterwards members visited St. John's Chapel and Beauchamp Tower.

## Christmas Juvenile Lectures.

Wednesday, December 29, 1909, at 5 p.m., "The Camel: the Ship of the Desert." Miss Lina Eckenstein.

Wednesday, January 5, 1910, "The Science of some Common Things." Mr. George Earle, M.A.

Wednesday, January 12th, "How Plants Eat, Drink and Grow." Miss Marie C. Stopes, D.Sc., Ph.D., F.L.S.

Wednesday, January 19th, "Comets and Shooting Stars." Mr. P. E. Vizard, F.R.A.S.

These lectures, which were illustrated with lantern slides or models, were free to Members' children, other children being admitted on payment of 6d. each.

# The Astronomical Observatory and Meteorological Station.

It may be here recalled that in 1899 a Committee was formed for the purpose of accepting the gift of an Astronomical Telescope offered by Colonel Heberden. This Committee became the Council of the Hampstead Scientific Society. By permission of the London County Council this telescope was housed in an Observatory in the Bathing Pond enclosure on the East Heath. In the succeeding years, while the membership of the Society and its activities increased, the telescope was little used, owing to the unsuitability of the site and the difficulty of access.

Members will hardly need reminding that in the summer of 1907 the Council of the Society applied to the London County Council for leave to move the Observatory House to the Flagstaff enclosure and to add a Meteorological Station; that leave was given and a licence issued. They will remember that on the proposal becoming known a strong opposition was manifested in the London Press to the use of the site for the purpose, culminating in a leading article in *The Times* on Nov. 8, 1907, some members of the Society joining in the protest; and that the Council of the Society withdrew the proposal in face of the unexpected opposition. It may interest members to hear some details of the investigations that have since been made, the negotiations that ensued, and the steps taken that have led to the successful carrying out of the long-felt desire of the Council to possess an Astronomical Observatory and Meteorological Station in a suitable position.

Mention should be made of the encouragement given to the Council in the pursuit of this object by the gift to the Society by Dr. F. Womack of a telescope superior to that formerly in the possession of the Society. The desire for a Meteorological Station was prompted by Dr. Hugh Robert Mill. At the Conference of Delegates of Corresponding Societies at the British Association Meeting held at York in 1906, Dr. Mill pointed out that valuable meteorological work could be done by local Societies (see Report and Proceedings of the Hampstead Scientific Society, 1906, p. 26), Encouragement was given by him at the lecture he delivered before the Society on December 7th of the same year (*Ibid.* p. 16). From that time to this his advice has been frequently asked and freely given.

As it seemed hopeless to look to the London County Council

for another site, investigations were made early in 1908 in the hope of finding a position on private land suitable from an astronomical and meteorological point of view. After many months of labour these efforts proved fruitless. One spot remained that seemed admirably adapted for the purpose, viz., the covered reservoir in the possession of the Metropolitan Water Board, but it was felt that it would be vain to attempt to induce such an august body to grant the use of the site.

As no other position seemed available, it was decided in the spring of 1908 to approach the Metropolitan Water Board. The preliminary negotiations were encouraging, and a formal letter of appeal was sent to the Board on July 8th. The Council of the Society was then asked to prepare detailed plans of the site required and of the building it was proposed to erect, suggestions being made as to the conditions the Board would require to be fulfilled. An interval of some months ensued, during which inquiries were made and experts consulted. Mr. Frank J. Potter kindly consented to act as architect and to draw up the plans. Estimates were obtained from Mr. John Reid of Manchester for supplying the revolving roof, and from Mr. James J. Hicks for the meteorological instruments. The plans were finally submitted to the Engineer of the New River District on December 10th, 1908, and on February 12th of the following year the Society was informed that the Board had agreed to the proposal, subject to certain conditions which the Council was able to accept. A special meeting of the members of the Society was called on April 2nd, before which the scheme was laid : it received the unanimous approval of those present. Many promises of support having been obtained, an appeal for contributions was issued on April 27th, together with a preliminary list of donations. The appeal was most generously responded to, not only by members of the Society, but also by many residents of Hampstead and others, promises of support to the extent of £220 being given in a short time. It is interesting to note that every one of these promises was redeemed and the money paid on first asking. Builders' estimates were obtained, and the work entrusted to Mr. George Kentish. An agreement with the Metropolitan Water Board was drawn up and signed on July 31st, and the work was ordered to be put in hand in August.

By the kind permission of Mr. J. S. Granville Grenfell, an opening ceremony was held in the gymnasium of Heathmount School on Saturday afternoon, November 6th, which was largely attended. Mr. P. E. Vizard presided, and addresses were given by Dr. F. Womack and by Dr. H. R. Mill. The latter referred

to the importance to London of having a fully equipped and scientifically conducted Meteorological Station on the summit of Hampstead Heath and congratulated the Society on the position and equipment of the Station and the unexceptionable manner of exposure of the instruments. The company then proceeded to the Observatory, which was formally declared open by Dr. Womack.

Since the formal opening ceremony much work has required to be done. Arrangements had to be made for the taking of the meteorological records twice daily, viz. at 9 a.m., and 9 p.m., no holidays being allowed. After various proposals, suggestions and trials, the Metropolitan Water Board again came to the rescue. An agreement has been made between the Board and the Society whereby, for the consideration of £10 a year, one of the servants of the Board who is in daily attendance at the Reservoir shall take the readings of the instruments and make notes of the prevailing weather, an understudy being appointed for those occasions on which the principal recorder shall not be able to attend. These men were trained to their work during the last weeks of the old year, and from January 1st trustworthy records have been made. They are published in the monthly returns of the Meteorological Office and are appearing weekly in the columns of *The Hampstead and Highgate Express*. The Society has been very fortunate in securing the experienced services of Mr. E. L. Hawke, F.R.Met.Soc., who is devoting much time to the superintendence of the Station and to the reducing and publishing of the records. He has kindly consented to accept the office of Honorary Meteorologist to the Society.

The sidereal clock, very generously presented by Mr. Edward J. Duveen, was purchased of Messrs. Dent and was installed in the month of December.

The adjustment of the telescope and preparation of the Observatory for the reception of workers and visitors have caused repeated delays. Unforeseen difficulties have arisen and many times have the Observatory Committee met to consider them. It is expected that these difficulties will shortly be finally removed.

## BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

### Conference of Delegates of Corresponding Societies.

*Report to the Hampstead Scientific Society of its Delegate.*

Owing to the Meeting of the British Association having been arranged to take place this year at Winnipeg, it was decided to hold the Annual Conference of Delegates of Corresponding Local Societies in London. The Conference was held on October 25th and 26th, in the rooms of the Geological Society at Burlington House, under the chairmanship of Professor A. C. Haddon, F.R.S. Your Delegate was present on both days.

On Monday, October 25th, the Chairman gave an address consisting of suggestions as to the works especially suitable for Local Societies to carry out. He recommended intensive works in Natural History, Geology, Meteorology, and Anthropology, in the localities from which the Societies drew their members. He referred to Dr. H. R. Mill's study of an area in the south-east of England, as a model of such work in its own domain. Mr. J. Gray read a paper on Anthropometry, exhibiting and explaining the instruments required, and showing the valuable work that Local Societies could undertake in contributing to a national survey of the physical characteristics of the people.

The meeting of Tuesday, October 26th, was occupied with a discussion as to the advisability of seeking Government aid in the establishment of a fund for assisting Scientific Societies in the publication of original work. The discussion was opened by Professor R. Meldola, F.R.S. It was generally admitted that good original work was done by many Local Societies, whose resources were insufficient to allow of publication in their own proceedings. Much difference of opinion, however, was shown as to the advisability of seeking Government aid for such a purpose, some speakers expressing the opinion that the multiplication of local publications was itself objectionable, and that any good original work was readily received for publication by the great learned societies.

C. O. Bartrum.

## SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

*Report to the Hampstead Scientific Society of its Delegate to the Congress.*

The Congress of 1909 was held in the city of Winchester, when a large number of persons from the South-Eastern Counties were in attendance. The President, Dr. Dukinfield Scott, F.R.S., delivered his address on Wednesday, June 9th, in the Town Hall. Dr. Scott spoke on the Fossil Flora of the surrounding country, but dwelt more especially on the Cycads of the Wealden.

During the Congress there were archæological excursions about the city, to Winchester School and to the underpinning works at the Cathedral. There was also a geological excursion to the north of Winchester, and a visit by train to Southampton.

Many interesting papers were read at the morning meetings, notably one on the Origin of the Southern Rivers, by F. W. Gwinnell, F.G.S.

Your Delegate and another member were the only representatives of our Society present.

The Autumn Meeting was held in November at University College, when three discourses were delivered before the members. Our Society was well represented on this occasion, twelve Members being present.

The next Congress will be held in June 1910, at Guildford.

HUGH FINDON.

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## Rules of the Society.

Copies of the Rules may be obtained on application to the Honorary Secretaries, 12, Heath Mansions, Heath Street, N.W.

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# List of Members.

*Corrected to March 4th, 1910.*

**Members are particularly requested to notify any change of address to the Hon. Secretaries of the Society, 12, Heath Mansions, Heath St., Hampstead, N.W.**

The figures before the Member's name refer to the year of election. The letters, A—Astronomical; N.H.—Natural History; P.—Photographic, give the Sections to which the member has expressed a wish to be attached. Any member however is entitled to attend any Section.

## Honorary Members.

| | | |
|---|---|---|
| 1900. | Bushe-Fox, J. P. .. .. | Ben Lomond House, Downshire Hill, N.W. |
| 1903. | Dawkins, Prof. W. Boyd, M.A., D.Sc., F.R.S. | Fallowfield House, Manchester |
| 1899. | Heberden, Colonel Henry, R.A., J.P. | 28, Buckland Crescent, Hampstead |
| 1899. | Jermyn, F. Lubbock .. | Danny Corner, Stirling Road, Bournemouth |
| 1899. | Martin, Basil W., M.B., Ch.B., F.Z.S. | Murrayfield, King's Road, Reading |
| 1899. | Womack, Frederick, M.B., B.Sc. (Vice-President) | 115, Alexandra Road |

## Ordinary Members.

| | | | |
|---|---|---|---|
| | 1899. | Abbott, Rev. E. A., D.D .. | Well Side, Well Walk |
| N.H. | 1903. | Acret, Charles, F.R.G.S. .. | 43, Rosslyn Hill |
| | 1904. | Acworth, J. J., Ph.D., F.I.C., F.C.S. | Thornbank, Shoot-up-Hill, Brondesbury |
| A. | 1908. | Alcock, N. H., M.D. .. .. | 22, Downshire Hill |
| N.H., P. | 1901. | Alcock, S. P. .. .. | 5, Rudall Crescent |
| N.H. | 1902. | Allcock, Miss N. .. .. | 20, Shirlock Road, Gospel Oak |
| A., N.H. | 1903. | Allen, A. Jukes .. .. | 17, Well Walk |
| A. | 1906. | Apps, J. L. B. .. .. | 13, Rudall Crescent, N.W. |
| | 1906. | Argyle, Jesse .. .. .. | *Express* Office, High Street |
| A. | 1908. | Arnold, Miss Lucy .. .. | 27, Melrose Avenue, Willesden Green, N.W. |
| P. | 1906. | Atkin, Geo. Duckworth .. | 9, Lindfield Gardens |

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| | 1907. | Atkinson, B. E. .. | .. 14, Rosslyn Hill |
| | 1907. | Atkinson, Robert .. | .. 14, Rosslyn Hill |
| | 1899. | Avenell, George .. | .. 17, Worsley Road |
| A. | 1907. | Baillie, James R. .. | .. 1, Akenside Road |
| | 1899. | BAILY, WALTER, M.A., F.Z.S. (Vice-President) | 4, Rosslyn Hill |
| P. | 1899. | Baker, F. H. .. | .. 95, Belsize Road |
| | 1899. | Bakewell, H. J. .. | .. 60, South Hill Park |
| N.H. | 1906. | BARHAM, SIR GEORGE, J.P. (Vice-President) | 112, Haverstock Hill |
| | 1909. | Barratt, Thomas J. .. | .. Bell Moor, Hampstead Heath |
| N.H. | 1910. | Barrett, Mrs. Jerry .. | .. 110, Heath Street, N.W. |
| A. | 1910. | Barrett, Lionel .. | .. 110, Heath Street, N.W. |
| | 1899. | BARTRUM, C. O., B.Sc. (Hon. Secretary of the Society) | .. 12, Heath Mansions, Heath Street |
| | 1906. | Bartrum, Mrs. C. O. | .. 12, Heath Mansions, Heath Street |
| | 1909. | Bartrum, Miss .. | .. 14, Gayton Crescent |
| | 1902. | Bartrum, Miss E. M., B.A. .. | 14, Gayton Crescent |
| N.H., P. | 1906. | Bashford, Mrs. .. | .. 10, Prince Arthur Road |
| A., N.H. | 1910. | Batley, H. G. .. | .. 21, Fellows Road, N.W. |
| | 1909. | Bayliss, Dr. W. M., F.R.S., | St. Cuthbert's, West Heath Road |
| A. | 1904. | Bell, Edward, M.A. .. | .. The Mount, Heath Street |
| | 1904. | Berridge, Miss A. L. .. | .. 24, Thurlow Road |
| | 1903. | Bird, Miss Alice .. | .. 6, Windmill Hill |
| N.H. | 1907. | Blair, Alec Hood .. | .. Wygtoun, Crediton Road |
| P. | 1906. | Blyth, C. F. T. .. | .. 22, Tanza Road |
| | 1903. | Bradford, Henry .. | .. 37, Trevor Square, S.W. |
| N.H. | 1909. | Bromwich, Joseph .. | .. 19, Hamilton Gardens, St. John's Wood, N.W. |
| | 1904. | Brown, W. Carnegie, M.D. | 13, Hampstead Hill Gardens |
| | 1899. | BRYANT, MRS. SOPHIE, D.Sc., D.Litt. (Vice-President) | 6, Eldon Road |
| N.H. | 1908. | Burton, James .. | .. 11, Ulysses Road, N.W. |
| P. | 1906. | Bushe-Fox, Miss L. .. | .. Ben Lomond House, Downshire Hill |
| N.H., P. | 1909. | Buszard, Frank .. | .. 30, Glenloch Road, Haverstock Hill, N.W. |
| N.H. | 1905. | Carter, William, M.A. | .. 1, Belsize Grove |

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| | 1910. | Chalkley, J. W. .. .. | 19, Platts Lane |
| N.H., P. | 1901. | Champneys, Mrs. Basil .. | Hall Oak, Frognal Lane |
| P. | 1900. | Chandler, P. W. .. .. | 5, Rosslyn Gardens |
| A., N.H. | 1901. | Channing, F. C., F.Z.S. .. | 62, Fellows Road |
| N.H. | 1907. | Chapman, A. Chaston, F.I.C. | 38, Primrose Hill Road |
| A. | 1907. | Chapman, Mrs. A. Chaston .. | 38, Primrose Hill Road |
| | 1900. | Clarke, Miss .. .. .. | 4, Wellington Place, N.W. |
| N.H. | 1909. | Clarke, Rev. Edward T. .. | 36, Maitland Park Road |
| | 1899. | Clarke, Henry, J.P. .. .. | Cannon Hall |
| A., P. | 1902. | Claudet, A. C. .. .. | 27, Daleham Gardens |
| | 1902. | Coates, Joseph .. .. | 13, Willoughby Road |
| A. | 1907. | Conder, Hugh .. .. | "East View," Bloomfield Road, Highgate, N. |
| A., N.H. | 1903. | Cooke, A. Clement .. .. | 9, Minster Road, N.W. |
| A., N.H. | 1905. | Cooke, Mrs. A. C. .. .. | 9, Minster Road, N.W. |
| | 1908. | Cooke, Conrad W., M.I.E.E. | The Pines, Langland Gdns. |
| N.H. | 1903. | COTTAM, G. H., M.I.E.E. (Member of Council) .. | 38, Glenloch Road |
| | 1910. | Cottam, Mrs. George H. .. | 38, Glenloch Road |
| N.H. | 1908. | Crawshay-Williams, Leslie .. | 73, Boundary Road |
| P. | 1899. | CRUMP, E. COMPSON (Hon. Treasurer) .. .. | 28, High Street |
| | 1905. | Crump, Mrs. E. C. .. .. | 28, High Street |
| P. | 1908. | Cubley, Arthur, M.D. .. | North Western Hospital |
| A., N.H. | 1910. | Culley, Miss F. E. .. .. | 15, Denning Road |
| | 1908. | Cunnington, C. H. .. .. | 86, West End Lane |
| | 1899. | CUNNINGTON, C. W., M.R.C.S., D.P.H. (Member of Council) | 86, West End Lane |
| P. | 1909. | Curwen, Harold .. .. | 1, Woburn Square, W.C. |
| P. | 1900. | CURWEN, H. B. (Member of Council) .. .. | Enfield House, Windmill Hill |
| | 1909. | Cushny, A. R., M.D., F.R.S. | 8, Upper Park Road, N.W. |
| | 1910. | Dalton, Sir C. N., K.C.M.G., C.B., D.C.L. | 26, Belsize Lane |
| | 1910. | Dalton, Lady .. .. | 26, Belsize Lane |
| | 1908. | Darley, C. W., I.S.O., M.I.C.E. | 5, Arkwright Road |
| | 1908. | Davis, E. .. .. .. | 2, East Heath Road |
| | 1904. | Davis, R. R. .. .. .. | 2, East Heath Road |
| N.H. | 1906. | Dawson, William, B.Sc. .. | 49, South Hill Park |
| P. | 1909. | Deacon, Rev. A. E., M.A. .. | Christ Church Vicarage, Cannon Place |
| | 1900. | Deedes, Rev. Brook, M.A. .. | The Vicarage, Hampstead |

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| P. | 1910. | de Hamel, L. C. .. | .. 12, Crossfield Road, N.W. |
| N.H. | 1907. | de Vesian, Roland Ellis | .. 6, Gayton Crescent |
| | 1905. | Dickinson, F. L. A. .. | .. 12, Ferncroft Avenue |
| A., N.H. | 1909. | Dixon, A. L., B.A. .. | .. 35, North Hill, Highgate, N. |
| P. | 1901. | Dowson, Mrs... .. | .. Kingsway, Gerrard's Cross |
| P. | 1902. | Drummond, J. C. .. | .. 12, Worsley Road |
| P. | 1902. | Drummond, Mrs. .. | .. 12, Worsley Road |
| | 1909. | Drummond, Miss .. | .. 13, South Hill Park, N.W. |
| | 1899. | Drysdale, Mrs. .. | .. Wick Hall, Radley, Berks |
| A., N.H., P. | 1903. | Dudman, G. Henderson | .. 16, Redbourne Avenue, Church End, Finchley, N. |
| | 1899. | Dudman, J. .. .. | .. 28, The Grange Drive, Winchmore Hill, N. |
| | 1909. | Duveen, Edward J. .. | .. Gangmoor, Hampstead Heath |
| | 1906. | Dyer, Bernard, D.Sc. | .. 15, Lindfield Gardens |
| | 1906. | Dyer, Mrs. .. .. | .. 15, Lindfield Gardens |
| | 1908. | Eckenstein, Miss Lina | .. 34, Greencroft Gardens |
| A. | 1900. | EDGEWORTH, PROFESSOR F. Y., M.A., D.C.L., M.B.A., (Vice-President) | 5, Mount Vernon |
| A., N.H. | 1909. | Ellison, F. O'Brien, M.D. | .. Hampden Club, Phœnix St., N.W. |
| N.H. | 1908. | Esson, W. B., M.I.C.E., M.I.E.E. | 127, Adelaide Road |
| P. | 1906. | Ettlinger, Julius .. | .. 83, Greencroft Gardens |
| | 1900. | Faraday, Harold .. | .. 8, Oak Hill Park, Frognal |
| | 1899. | Fielder, Mrs. .. .. | .. West Hill Lodge, Lower Terrace |
| | 1899. | Figgis, Samuel .. | .. Montague Grove, Frognal |
| N.H. | 1901. | FINDON, HUGH, F.L.S. (Natural History Secretary) | .. 3, Torriano Avenue, Camden Road, N.W. |
| | 1907. | Fluck, A. W. .. .. | .. 54, Brookfield, Highgate |
| N.H. | 1903. | Forbes, Mrs. P. L. .. | .. 16, Rosslyn Hill |
| N.H. | 1908. | Fox, R. Fortescue, M.D. | .. 13, Belsize Park Gardens |
| N.H. | 1908. | Fox, R. Hingston, M.D. | .. 19, Hampstead Hill Gardens |
| N.H., P. | 1905. | Freuer, Miss .. .. | .. 32, Willoughby Road |
| N.H. | 1902. | Gard, W. G. Snowdon, LL.B., F.G.S. | 9, Rosslyn Hill |
| N.H. | 1902. | Garlick, Miss .. .. | .. 11, Well Road |
| | 1899. | GARNETT, WILLIAM, M.A., D.C.L. (Member of Council) | The Wabe, Redington Road |

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| P. | 1908. | Gasquoine, Frank W. .. | 135, Constantine Road |
| | 1909. | Glover, L. G., M.D. .. .. | 17, Belsize Park, N.W. |
| | 1900. | Godden, William .. .. | 143, Chapter Road, Willesden Green |
| N.H. | 1901. | Goodchild, Herbert, M.B.O.U. | 66, Gloucester Road, Regent's Park |
| | 1903. | Gow, Rev. Henry, B.A. .. | 3, John Street |
| A., N.H. | 1908. | Gray, Arthur L. .. .. | 14, Princeton Mansions, Red Lion Square, W.C. |
| N.H. | 1903. | Grenfell, J. S. Granville, M.A. | Heath Mount School, Heath Street |
| A. | 1904. | Grundy, Edmund F. .. .. | 14, Thurlow Road |
| A. | 1904. | Grundy, Mrs. E. F. .. .. | 14, Thurlow Road |
| | 1899. | HARBEN, SIR HENRY, J.P. .. (Vice-President) | Seaford Lodge, Fellows Road |
| A., N.H. | 1910. | Hardcastle, Miss Bertha .. | 28, Well Walk |
| | 1910. | Hart, G. W. .. .. | 14, Redington Road, N.W. |
| A. | 1909. | HAWKE, E. L., F.R.Met.S. .. (Hon. Meteorologist) | 2, Akenside Road |
| P. | 1899. | HAYNS, JOHN .. .. (Member of Council) | Campbell Cottage, 20, John Street |
| | 1910. | Hepburn, Patric .. .. | 49, Downshire Hill |
| A., N.H. | 1906. | Hinderlich, Albert .. .. | 15, Lyncroft Gardens |
| P. | 1906. | Holmes, Morell F. .. .. | 59, South Hill Park |
| N.H. | 1902. | Homfray, Mrs. G. .. .. | 16, Church Row |
| A., P. | 1902. | Homfray, Miss .. .. | 16, Church Row |
| N.H. | 1901. | HOPSON, MONTAGU F., F.L.S., F.E.S. (Member of Council) | 30, Thurlow Road |
| NH. | 1902. | Hopson, Mrs. .. .. .. | 30, Thurlow Road |
| P. | 1910. | Horner, Miss Ethel .. .. | 20, Fairfax Road, N.W. |
| | 1909. | Hudson, Mrs... .. .. | 3, Ellerdale Road |
| | 1908. | Hunt, E. J. .. .. .. | 2, Frognal Mansions, N.W. |
| | 1900. | Hunter, J. W. .. .. | 41, Lancaster Road, N.W. |
| N.H., P. | 1903. | Hutchinson, Rev. H. Neville, B.A., F.G.S., F.Z.S. | 17, St. John's Wood Park, N.W. |
| P. | 1910. | Ince, P. G. .. .. .. | 69, Belsize Park, N.W. |
| N.H. | 1910. | Ince, Miss R. A. .. .. | 69, Belsize Park, N.W. |
| | 1908. | Jackson, Dr. D. H. .. .. | 95, Abbey Road |
| P. | 1910. | Jacob, R. S. .. .. .. | 24, Glenmore Road |
| | 1899. | James, Leonard, M.A. .. | 8, Lyndhurst Road |

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| A. | 1901. | James, Mrs. .. .. .. | 8, Lyndhurst Road |
| | 1899. | Jealous, Mrs. .. .. .. | 95, Fitzjohn's Avenue |
| | 1900. | Jessop, Edward, M.R.C.S., L.R.C.P. | 81, Fitzjohn's Avenue |
| P. | 1902. | Jones, A. Denman .. .. | St. Aubyn's, The Vale |
| P. | 1909. | Jones, A. W. .. .. | 3a, Belsize Parade |
| A., N.H. | 1908. | Jones, George Edward .. | 70, Belsize Park Gardens |
| | 1908. | Jordan, H. G. .. .. | 8, Belsize, Avenue |
| A., N.H. | 1909. | Kay, Mrs. John .. .. | 3, Northcote Mansions, Heath Street |
| A., N.H. | 1909. | Kay, Miss G. .. .. | 3, Northcote Mansions, Heath Street |
| | 1907. | Kearne, Miss .. .. | 1, Lyndhurst Gardens |
| | 1909. | Kidner, Miss B. M. .. | St. Martin's, Thurlow Road |
| A. | 1901. | Kinder, Miss M. A. .. .. | 44, Willow Road |
| | 1899. | King, Mrs. M. L. .. .. | 18, Lyndhurst Road |
| | 1909. | Kirner, Joseph .. .. | 78, Heath Street |
| | 1910. | Klein, W. G. .. .. .. | 24, Belsize Park |
| P. | 1905. | Knowles, C. Heygate, L.D.S. | 18, Worsley Road |
| N.H. | 1909. | Lagercrantz, Bengt .. | 182, Haverstock Hill |
| N.H. | 1910. | Lambert, Miss Lois C. .. | 4, Wildwood Terrace, North End |
| A.,N.H.,P. | 1908. | Laverie, J. A. .. .. | 5, Carlingford Road |
| | 1907. | Law, J. A. .. .. .. | 12, Frognal Mansions |
| | 1907. | Law, Mrs. .. .. .. | 12, Frognal Mansions |
| | 1899. | Lister, Miss .. .. .. | Upper Heath, Heath Street |
| P. | 1900. | Lown, H. F. .. .. .. | 31, Aberdare Gardens |
| P. | 1908. | Mager, G. E. .. .. .. | 28, Carleton Road, Tufnel Park, N. |
| N.H., P. | 1902. | Mallam, W. A., M.R.C.S., L.R.C.P. | 63, Rosslyn Hill |
| P. | 1907. | Marker, A. H. .. .. | 11, Heath Drive |
| N.H., P. | 1901. | Marks, K. I., F.R.M.S. .. | 4, Woodchurch Road |
| N.H. | 1910. | Marriott-Hodgkins, Miss .. | 49, Canfield Gardens |
| N.H., P. | 1908. | Marshall, Percy E. .. .. | Netley Cottage, The Grove |
| | 1907. | Martelli, Miss Agnes .. .. | 6, Prince Arthur Road |
| | 1899. | Martin, Miss F. .. .. | 3, Foley Avenue |
| | 1906. | Mason, Miss Ella .. .. | 8, Priory Road, N.W. |
| P. | 1908. | May, W. E. Southcomb .. | 15, Endsleigh Gardens, N.W. |
| | 1910. | Maynard, H. R. .. .. | Kingswood, Antrim Street |

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| | 1910. | Maynard, Mrs. H. R. | .. Kingswood, Antrim Street |
| P. | 1901. | Melliss, H. J., B.A. .. | .. 16, Hollycroft Avenue |
| | 1905. | Messenger, H. W., L.D.S. | .. 47, Rosslyn Hill |
| | 1908. | Middleton, L. .. | .. 17, Willoughby Road |
| | 1899. | Millar, Henry E. .. | .. Heathdown, East Heath Rd. |
| P. | 1900. | Money, C. J. .. .. | .. 8a, Heath Street |
| | 1899. | Moore, Miss M. E. .. | .. 50, Willow Road |
| A., P. | 1909. | Morgan, James .. | .. 27, Heath Hurst Road |
| | 1903. | Murdoch, G. H. .. | .. 49, Parliament Hill Road |
| P. | 1908. | Musmann, E. P. B. .. | .. 61, Frognal |
| A. | 1910. | Neville, Bernard M., B.Sc. | .. 42, Constantine Road |
| N.H., P. | 1908. | Nicholls, Miss Sophie | .. 6, Eldon Road |
| A. | 1904. | Organ, Miss Winifred C. | .. 60, Dale Road, Gospel Oak |
| N.H. | 1903. | Pace, Harry .. .. | .. 21, Constantine Road |
| P. | 1907. | Page, Reginald W. .. | .. 31, Buckingham Mansions |
| | 1909. | Palmer, J. L. .. | .. 2, The Chestnuts, Branch Hill |
| | 1909. | Palmer, Mrs. J. L. .. | .. 2, The Chestnuts, Branch Hill |
| N.H., P. | 1899. | Park, Mrs. .. .. | .. 92, Fellows Road |
| P. | 1901. | Park, Bertram C. P. | .. 92, Fellows Road |
| | 1908. | Parker, Miss C. M. .. | .. "The Wych," John Street |
| | 1899. | PAYNE, E. S. .. .. (Member of Council) | .. 45, Rosslyn Hill |
| | 1905. | Pearce, Robert .. | .. Beechcroft, East Heath Rd. |
| | 1905. | Pearce, Miss .. .. | .. Beechcroft, East Heath Rd. |
| N.H. | 1902. | Pearse, D. Colbron .. | .. 11, Worsley Road |
| N.H. | 1909. | Pennells, J. R. E. .. | .. 7, Lynton Road, Brondesbury |
| | 1902. | PETRIE, Prof. W. M. FLINDERS, D.C.L., LL.D., Ph.D., F.R.S. (President) | 8, Well Road |
| | 1902. | Petrie, Mrs. Flinders | .. 8, Well Road |
| P. | 1899. | Pidcock, G. D., M.A., M.D., M.R.C.P. | 74, Fitzjohn's Avenue |
| P. | 1907. | Pidgeon-Fletcher, G. J. | .. 2, Manstone Road, Cricklewood |
| N.H., P. | 1903. | Plowman, H., F.S.A. | .. 23, Steele's Road |
| | 1910. | Porter, Prof. A. W. .. | .. 87, Parliament Hill Mans., Lissenden Gardens, N.W. |
| P. | 1902. | Prance, R. H. .. | .. 29, Netherhall Gardens |

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| | 1909. | Pratt, Miss Emmeline .. | 3, Warwick Mansions, Pond Street |
| P. | 1905. | Pugh, E. Staniland .. .. | 31, Belsize Road |
| | 1903 | Purry, Walter .. .. | 44, Well Walk |
| | 1903. | Purry, Mrs. .. .. .. | 44, Well Walk |
| P. | 1902. | Quekett, O. C. .. .. | 70, Greencroft Gardens |
| N.H. | 1906. | Radcliffe, Henry .. .. | 18, Tanza Road |
| | 1899. | Raisin, H. W. .. .. | Hawk's Nest, Stanhope Ave. Church End, Finchley |
| | 1908. | Rangel, Miss .. .. .. | 17, Willoughby Road |
| P. | 1908. | Ransom, H. B. .. .. | 28, Belsize Park Gardens |
| | 1899. | Rayner, Henry, M.D. .. | Upper Terrace House |
| A., N.H. | 1906. | Ridges, Miss Marian .. .. | "Aberdeen," South End Rd. |
| | 1899. | Ridley, Miss J. .. .. | 31, Daleham Gardens |
| A. | 1910. | Roberts, Alfred .. .. | 119, Plimsoll Road, Finsbury Park, N. |
| | 1909. | Roberts, F. G. Adair, J.P. .. | Oak Hill Lodge, Frognal |
| | 1909. | Roberts, Mrs. Adair .. .. | Oak Hill Lodge, Frognal |
| | 1903. | Robins, P. S. .. .. | 20, Greencroft Gardens |
| P. | 1907. | ROGER-SMITH, HUGH R., M.D. (Member of Council) | 1, College Terrace |
| | 1910. | Rogers, C. E. .. .. | 37, Avenue Mansions, Finchley Road |
| A. | 1902. | Rowney, W. G. .. .. | 2, Oakhill Park |
| N.H., A. | 1902. | RUDLER, F. W., I.S.O., F.G.S. (Vice-President) | Ethel Villa, Rickett's Hill, Tatsfield, Westerham |
| P. | 1904. | Russell, Chas. A., K.C. .. | 53, Netherhall Gardens |
| | 1904. | Russell, Mrs. .. .. .. | 53, Netherhall Gardens |
| | 1904. | Sanders, C. G. .. .. | 22, Ferncroft Avenue |
| | 1904. | Sanders, Mrs. C. G. .. .. | 22, Ferncroft Avenue |
| N.H., P. | 1909. | Sanders, H. Armytage .. | 38, Pandora Road, N.W. |
| | 1899. | SCHÖRDER, WALTER (Member of Council) | Telegraph Hill, West Heath |
| A., P. | 1902. | Sharman, Henry, M.D. .. | Sedgemoor, Arkwright Road |
| P. | 1902. | Shenton, E. W. H., M.R.C.S., L.R.C.P. | 7, Heath Mansions, The Grove |
| P. | 1902. | Shenton, Mrs. E. W. H. .. | 7, Heath Mansions, The Grove |
| N.H., P. | 1905. | Sibson, A. E. .. .. .. | 19, Carlingford Road |
| P. | 1905. | Smart, H. A. .. .. .. | 40, Compayne Gardens |

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| P. | 1903. | SMART, H. NEVIL (Photographic Secretary) | 40, Compayne Gardens |
| N.H. | 1908. | Smith, R. T., M.D., Lond. .. | 117, Haverstock Hill |
| | 1908. | Stamp, F. U. .. .. | 29a, High Street |
| | 1908. | Stamp, Mrs. F. U. .. .. | 29a, High Street |
| P. | 1909. | Stern, Miss Rose .. .. | 14, Parliament Hill |
| P. | 1906. | Stevenson, E. H. .. .. | 43, Redington Road |
| | 1900. | STOKES, A. W., F.C.S., F.I.C. (Member of Council) | 60, Parkhill Road |
| | 1901. | Stokes, Mrs. .. .. .. | 60, Parkhill Road |
| | 1910. | Stone, Miss J. .. .. | St. Martin's, Thurlow Road |
| N.H. | 1902. | Stopes, Miss Marie C., D.Sc., Ph.D., F.L.S. | 14, Well Walk |
| N.H., P. | 1900. | Strange, R. Gordon, M.S., M.B. | 2, Belsize Avenue |
| P. | 1900. | Strange, Miss .. .. | 2, Belsize Avenue |
| P. | 1908. | Such, Henry .. .. .. | 2, Manor Mansions, Belsize Park Gardens |
| | 1908. | Suiter, Miss M. .. .. | "The Wych," John Street |
| | 1899. | Taylor, E. Claude, M.S., M.D., F.R.C.S. | Eland House, Rosslyn Hill |
| | 1899. | TEBB, A. E., M.D., B.S., D.P.H. (Member of Council) | 3, Grove Cottages |
| | 1899. | Tebb, Mrs. A. E. .. .. | 3, Grove Cottages |
| | 1899. | Thompson, A. Hugh, M.A., M.D. | 26, Ellerdale Road |
| N.H. | 1906. | Thompson, Miss J. A. .. | 2, Narcissus Road |
| | 1901. | THOMPSON, Prof. SILVANUS, P., D.Sc., F.R.S. (Vice-President) | Morland, Chislett Road, N.W. |
| P. | 1900. | Thrower, Alfred .. .. | 124, Haverstock Hill |
| N.H. | 1906. | Thwaite, Mrs. .. .. | 10, Carlton Terrace, Child's Hill, N.W. |
| A. | 1905. | Tiver, Ernest .. .. .. | 8, Christchurch Place |
| P. | 1908. | Turck, Miss Eliza .. .. | 7, St. George's Square, Primrose Hill |
| | 1902. | Turner, G. H. .. .. | 35, Rosslyn Hill |
| | 1910. | Varley, Percy .. .. | 1, Kemplay Road |
| | 1910. | Varley, Mrs. Percy .. .. | 1, Kemplay Road |
| | 1909. | Vassal, Mme. Gabrielle M. | 112, Greencroft Gardens |
| | 1909. | Venables, W. H. .. .. | 129, Fordwych Road, N.W. |
| P. | 1901. | Viner, Miss F. A. .. .. | 15, Thurlow Road |

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| A., P. | 1899. | VIZARD, P. E., F.R.A.S. (Vice-President and Astronomical Secretary) | Belsize Lodge, Belsize Lane |
| | 1900. | Vizard, W. G. .. | .. 17, South Hill Park |
| | 1904. | Waghorn, John .. | .. 11, Arkwright Road |
| | 1904. | Waghorn, Mrs. J. .. | .. 11, Arkwright Road |
| | 1901. | Wallis, Ernest .. | .. Lested Lodge, Well Walk |
| | 1901. | Wallis, Mrs. Ernest .. | .. Lested Lodge, Well Walk |
| A., N.H., P. | 1906. | Watson, Miss H. M. .. | 12, Canterbury Mansions, Lymington Road |
| N.H. | 1909. | Watt, Hugh Boyd, M.B.O.U. | 3. Willow Mansions, West Hampstead |
| N.H. | 1899. | Whiting, James E. .. | .. 5, South End Road |
| N.H. | 1910. | Whitton, W. A. .. | .. 11, Weston Park, Crouch End, N. |
| N.H. | 1906. | Wight, George P. .. | .. 29, Nassington Road, N.W. |
| P. | 1909. | Wilkins, Rev. W. H., M.A. | 16, St. George's Road, Kilburn, N.W. |
| N.H. | 1902. | WILKS, Sir SAMUEL, Bart., M.D., LL.D., F.R.S. (Vice-President) | 8, Prince Arthur Road |
| A., N.H. | 1902. | Wilks, Mrs. .. .. | .. 19, Denning Road |
| N.H., P. | 1909. | Williams, Dr. A. D., M.B. .. | Crantock, Golder's Green |
| A. | 1909. | Williams, Dr. E. Ulysses .. | Crantock, Golder's Green |
| | 1909. | Williams, Miss .. | .. Crantock, Golder's Green |
| P. | 1902. | Williams, Philip H., A.C.A. | 41, Downshire Hill |
| | 1909. | Wood, Henry J. .. | .. 4, Elsworthy Road, N.W. |
| N.H. | 1906. | Wright, Miss Elizma | .. 17, Stanley Gardens, N.W. |
| P. | 1903. | WYLIE, R. W., M.A. (Honorary Secretary of the Society) | .. 44, Avenue Road, Highgate |
| | 1901. | Wylie, Mrs. R. W. .. | .. 44, Avenue Road, Highgate |


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