most obviously governed is *temperature*. On warm days the response ranged from 0.005 to 0.02 volt; on cold days it did not rise above 0.005, and was sometimes *nil*. Some tests upon leaves in a warmed box gave satisfactory results, which may thus be summed up: The normal response at 15°–20° C. is diminished or abolished at low temperature (10°) augmented at high temperature (30°), diminished at higher temperature (50°), and abolished by boiling.

As the month of May advanced, the iris leaves, even in the warm box, became more and more inert, and by the 23d inst., when the plants were mostly full grown and in flower, no satisfactory leaf could be found. Leaves of iris appear to give more marked response at or about mid-day, than at or about 6 p. m. Tested by Sach's method the leaves give no evidence of starch activity during isolation.

On the failure of the iris leaves to react, other leaves were sought for which should give evident differences of reaction in correlation with evident differences of state. Leaves of tropæolum and of mathiola gave a response to light contrary in the main to the ordinary iris response, viz, 'positive' during illumination, and subsequently 'negative.' In these two cases leaves empty of starch acted better than leaves laden with starch. Leaves of begonia gave a variety of responses strongly suggestive of the simultaneous action of two opposed forces effecting a resultant deflection in a + or — direction. Leaves of ordinary garden shrubs and trees, etc., *e. g.*, lilac, pear, almond, mulberry, vine, ivy, gave no distinct response; this is possibly due to a lower average metabolism in such leaves as compared with the activity of leaves of small young plants in which leaf-functions are presumably concentrated within a smaller area. The petals of flowers gave no distinct response, which indicates that chloroplasts are essential to the reaction.

The effect of carbon dioxide upon the iris leaf was abolition of response during and after passage of the gas, with subsequent augmentation. Upon mathiola and trapæolum, augmentation of response followed on applying air containing 1 to 3 per 100 of carbon dioxide, and prompt abolition resulted from a full stream run through the leaf-chamber. On the air supply being kept clear of carbon dioxide there was gradual abolition of response, followed by gradual recovery on the re-admission of a small amount of carbon dioxide.

'Fatigue' effects may be produced if the successive illuminations (of five minutes duration) are repeated at short intervals (10 minutes). At intervals of one hour, successive illuminations of five minutes produce approximately equal effects. With the leaf of mathiola, periods of illumination of two minutes at intervals of 15 minutes were used without provoking any obvious sign of fatigue.

SCIENCE RESEARCH SCHOLARSHIPS.

The Commissioners for the Exhibition of 1851, as we learn from the London *Times*, have made the following appointments to Science Research Scholarships for the year 1900 on the recommendation of the authorities of the respective universities and colleges. The scholarships are of the value of £150 a year, and are ordinarily tenable for two years (subject to a satisfactory report at the end of the first year) in any university at home or abroad, or in some other institution approved of by the Commissioners. The scholars are to devote themselves exclusively to study and research in some branch of science, the extension of which is important to the industries of the country. A limited number of the scholarships are renewed for a third year where it appears that the renewal is likely to result in work of scientific importance.

Nominating Institution.	Scholar.
University of Edinburgh . .	Charles E. Fawsitt, B.Sc.
University of Glasgow.....	Vincent J. Blyth, M.A.
University of Aberdeen.....	James Moir, M.A., B.Sc.
Yorkshire College, Leeds...	William M. Varley, B.Sc.
University Coll., Liverpool..	John C. W. Humfrey, B.Sc.
University College, London	Samuel Smiles, B.Sc.
Owens College, Manchester.	Norman Smith, B.Sc.
Univ. Coll., Nottingham....	Lorenzo L. Lloyd.
Univ. Coll. of South Wales and Monmouthshire, Cardiff.....	Alice L. Embleton, B.Sc.
Royal Coll. Science, Dublin.	John A. Cunningham, B.A.
Queen's College, Galway....	William S. Mills, B.A.
University of Toronto.....	John Patterson, B.A.
Queens University, Kingston, Ontario.....	William C. Baker, A.M.
Dalhousie University, Halifax, Nova Scotia.....	James Barnes, M.A.
University of Sydney.....	John J. E. Durack, B.A.

The following scholarships granted in 1898 and 1899 have been continued for a second year

on receipt of a satisfactory report of work done during the first year:

Nominating Institution.	Scholar.	Place of Study.
Univ. St. Andrews..	J. C. Irvine, B.Sc.*	Univ. of Leipzig.
Mason Univ. Coll., Birmingham.	Henry L. Heathcote, B.Sc.	Univ. of Leipzig.
Univ. Coll., Bristol.	Winif. E. Walker, B.Sc.	Univ. Coll., London.
Yorkshire College, Leeds.	Fred. W. Skirrow, B.Sc.	Univ. of Leipzig.
Univ. Coll., Liverpool.	Charles G. Barkla, B.Sc.	Cavendish Lab., Cambridge.
Univ. Coll., London	Harriette Chick, B.Sc.	Thompson-Yates Lab., Univ. Coll., Liverpool.
Owens Coll., Manchester.	Frank A. Lidbury, B.Sc.	Univ. of Leipzig.
Durham Coll. Sci., Newcastle-upon-Tyne.	William Campbell, B.Sc.	Royal Coll. of Sci., S. Kensington.
Univ. Coll., Nottingham.	Louis Lownds, B.Sc.	Univ. of Berlin.
Univ. Coll. Wales, Aberystwith.	James T. Jenkins, B.Sc.	Univ. of Kiel and Biol. Institution, Heligoland.
Univ. Coll. of North Wales, Bangor.	Robert D. Abell, B.Sc.	Univ. of Leipzig.
Queens Coll., Belfast.	William Caldwell, B.A.	Univ. Würzburg.
McGill Univ., Montreal.	William B. McLean, B.Sc.	Owens Coll., Manchester.
Univ. of Melbourne	Bertram D. Steele, B.Sc.	Univ. of Breslau.
Queen's Coll., Cork.	Ed. J. Butler, M.B.	Univ. of Freiburg.
Univ. of New Zealand.	Joseph W. Mellor, B. c.	Owens Coll., Manchester.
Univ. Coll., London	Louis N. G. Filon, M.A.	King's Coll., Cambridge.

The following scholarships granted in 1898 have been exceptionally renewed for a third year:

Nominating Institution.	Scholar.	Place of Study.
Mason Univ. Coll., Birmingham.	A. H. H. Buller, B.Sc., Ph.D.	Univ. of Munich.
Yorkshire College, Leeds.	Harry T. Calvert, B.Sc.	Univ. of Leipzig.
Royal Coll. of Sci., Dublin.	Rob. L. Wills, B.A.	Cavendish Lab., Cambridge.
Dalhousie Univ., Halifax, N. S.	Eben. H. Archibald, M.Sc.	Harvard Univ.

SCIENTIFIC NOTES AND NEWS.

PROFESSOR A. MICHELSON, of the University of Chicago, has been awarded the grand prize of the Paris Exposition for his Echelon spectroscope.

IT is reported that Professor Haeckel, of Jena, is about to start for Java to conduct explorations in search of *Pithecanthropus erectus*.

IN the matter of the vacancy arising from the death of Professor James E. Keeler, the president and board of regents of the University of California have authorized astronomer W. W. Campbell to discharge the duties of the director of the Lick Observatory, *ad interim*.

M. M. OUSTALET and DEPOUSARQUES have been nominated by the Paris Academy of Sciences for the chair of zoology in the Muséum d'Histoire naturelle, rendered vacant by the death of Professor Milne-Edwards. One of these candidates will be selected by the minister of public instruction.

MR. THOMAS LARGE has been appointed assistant in charge of the Fresh Water Biological Station of the University of Illinois, at Meredosia, Illinois, to succeed Dr. C. A. Kofoid, who, as we have already announced, has accepted a call to the University of California.

MR. J. STIRLING, Government geologist of Victoria, is at present in London, and will address several scientific societies during his stay in England.

SURGEON A. R. THOMAS of the U. S. Marine Hospital Service has been sent to Glasgow to investigate the bubonic plague which appears to be increasing in that city.

THE Government of Queensland has engaged Dr. Maxwell, the sugar expert of Honolulu, for five years' service on the Food Commission at a salary of $20,000 a year.

DR. F. ROEMER, assistant in the Zoological Institute at Breslau, has been made curator in the Senckenbergischen Museum at Frankfurt-on-the-Main.

PROFESSOR K. LAMPERT, of Stuttgart, has been made curator of the Royal Natural History collections.

DR. D. MORRIS, the British Commissioner of Agriculture for the West Indies, is at present in Great Britain for the purpose of reporting to the Colonial office.

DR. C. VIRCHOW has been appointed chemist in the geological bureau at Berlin.

THE tomb of Sir Humphrey Davy, at Geneva, which for some years was in a neglected state, has recently been renovated.

DR. JOHN ANDERSON, M.D., F.R.S., has died at Buxton at the age of 66 years. He was appointed superintendent of the Indian Museum, Calcutta, in 1865, and made several expeditions to China. He was the author of