

Visual observations of three of the more prominent lines in the yellow and green are also given:—

Intensity	Observed λ	Remarks	Intensity	Observed λ	Remarks
5	5721	(Visual)	15	4350.3	
8	5583	(R. & C. 5723)	7	4340.9	H=4340.66
3	5393	"	4	4225.8	
4	5084.5	"	10	4203.7	
4	4979.0	R. & C. 4985	7	4188.2	
10	4801.3	H=4461.49	20	4166.6	
4	4817.2	"	10	4114.9	
5	4721.5	"	2	4102.2	H=4101.85
10	4681.1	R. & C. 4690	4	4045.4	
10	4644.7	R. & C. 4650	15	4013.0	
8	4623.8	K. & C. 4630	12	3932.0	
7	4609.9	"	7	3957.3	
4	4604.7	"	4	3917.5	
7	4578.7	"	—	3888.9	H=3889.15
9	4509.0	"	6	3867.6	
10	4460.0	"	10	353.6	
8	4435.7	"	7	3739.9	
6	4391.8	"	10	3664.6	
4	4372.1	"	5	3622.2	

A more detailed list of lines will be published later. We understand that Sir William Ramsay showed a photograph of the spectrum of the emanation at the meeting of the Royal Society on June 25. It will be of interest to compare the two spectra.

E. RUTHERFORD.
T. ROYDS.

University, Manchester, July 4.

The Recent Nocturnal Glows.

THE peculiar light phenomenon at midnight on June 30, which was seen, according to the papers, on the northern part of the sky at Copenhagen, Königsberg, Berlin, Vienna, Biala, and other places, was also observed by me at Prague. At 1h. 30m. a.m. on July 1, I saw in the direction N.E. and N.N.E. a peculiar strong orange-yellow light over the horizon, the colour of which was more orange in its lower parts and more yellow in its higher parts. Its upper limit was lying twenty to thirty degrees above the horizon. The whole sky was cloudless. Other people saw it here at 11 p.m. on June 30.

It is reported that magnetic disturbances were experienced on the telegraphic lines, but I saw no trace of the characteristic auroral bands or columns. I may be allowed to add that, according to Arrhenius, this time of the year corresponds to the minimum of auroral display (activity). Interesting is the fact that a high barometric maximum was lying in the north, and that we had winds from that direction for a whole week.

BOHUSLAV BRAUNER.

Bohemian University, Prague, July 4.

A Long-lived Solar Halo.

THERE has been visible here to-day a solar halo remarkable both for its vivid intensity and for its protracted duration. It was first noticed by me at 12.35 p.m. It then formed an unbroken ring, of which the most intensely luminous portion was to the south of the sun, and the least luminous portion to the west-north-west. Half an hour later the southern and northern quadrants of the circle were equally bright, but the northern appeared the more compact and definite; meanwhile, the eastern and western portions continued comparatively feeble, more especially the latter. *These conditions remained unchanged for fully 1½ hours!* After 2.15 p.m. the northern segment of the halo was alone conspicuous, and after 3.30 p.m. the ring was never again complete, though two mock suns (to the southward and eastward respectively) still testified to the original configuration. By 4.50 p.m. nothing remained but a diffused, pale rainbow-coloured mock-sun to the north of the sun; but after 5.15 p.m. this became less indefinite, and by 6 p.m. fully a semicircle of a halo was again traceable above the sun, but this faded gradually, nothing surviving after about 6.20 p.m. The unusually strong tone of rusty orange colouring, and the conspicuous darkness of the region enclosed, made the halo an unusually striking object when at its best (12.30 to 2 p.m.).

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Throughout the day cirrus cloud has strewn the sky in most interesting disorder and variety of forms. Telescopic observation of the sun's image showed (in the features of atmospheric distortion of the sun's limb) the existence of two distinct drifts of the atmosphere, viz. an upper current, of great velocity, passing over from the south-east above the drift from north-north-east that alone affected the local weather-cocks and chimneys' smoke. I may add that my experience as an observer of halos (both solar and lunar) has led me to the conclusion that cirrus clouds, or the conditions conducive to the formation of cirrus cloud, do not in themselves constitute the whole cause of the formation of halos, but that these are further the outcome of cross-currents in the region of cirrus formation.

CATHARINE O. STEVENS.

10 Woodstock Road, Oxford, June 30.

P.S.—Portions of solar halos were also seen here intermittently during July 1 and 2, thus giving a record of three successive days of halo formation.

Genial June.

THE month just past has fully upheld its character, as it did in the Jubilee year, 1887, and on other occasions.

There were a great number of dates suitable for observation (sixteen out of the last seventeen), but I found shooting stars rare.

The nights before June 29 were, I thought, unusually dark, the stars and Milky Way being beautifully bright and distinct; but on June 30 the firmament was abnormally luminous, with a very strong glow all over the north at midnight. Few stars could be seen, and the Milky Way was hardly distinguishable. On July 1 the phenomena of the previous night were repeated in rather a different aspect. There were many clouds of various tints, and the light was again intensely strong, the northern sky being involved in a brilliant aurora. I have never seen June nights so dark, and the Milky Way so gorgeously displayed in the heavens, as this year to June 28, nor have I ever noticed the sky so bright as it appeared on the nights of June 30 and July 1.

The aurora offered so vivid a spectacle that on the dates mentioned the shades of night may be said to have been quite dispersed, for even at midnight the reflected light from sky and cloud was so strong that terrestrial objects could be seen just as at dusk, say at about 10 p.m. on an ordinary June night.

W. F. DENNING.

Bristol, July 2.

THE DARWIN-WALLACE JUBILEE CELEBRATION AT THE LINNEAN SOCIETY.

ON July 1, 1858, Sir Charles Lyell and Dr. J. D. Hooker communicated to the Linnean Society a remarkable paper entitled "On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection," by Mr. Charles Darwin and Mr. Alfred Wallace. The history of this paper is familiar to every student of biology. Darwin had for many years been studying the question of natural selection and its bearing upon the origin of species, but, although his views were well known to several intimate friends, he had refrained from publishing them, and was still occupied in the collection of evidence when he received from Wallace a manuscript essay "On the Tendency of Varieties to Depart indefinitely from the Original Type," in which the same ideas were set forth. At the request of the author this manuscript, after perusal, was forwarded by Darwin to Sir Charles Lyell, with the added suggestion that the essay should be published as soon as possible. After consultation with Hooker, Darwin was induced to allow an extract from his own work on the subject to be published simultaneously.

The reading of this joint paper at the Linnean Society formed the starting point of a revolution in scientific thought the effect of which it would

be impossible to overestimate, and the Society has duly recognised the importance of the occasion in the commemoration which took place last week.

A peculiarly gratifying feature of the proceedings was the presence at the afternoon meeting of Dr. Wallace and Sir Joseph Hooker, and the fellows of the society and their guests thus had the remarkable privilege of hearing an account of the great event of fifty years ago from the lips of two of the principal actors therein. The society is also to be congratulated on the very cordial response made to their invitation by the numerous universities, academies and learned societies to which it was sent, the gathering being in all respects a thoroughly representative one.

The afternoon meeting was held in the large meeting room of the Institution of Civil Engineers at Westminster, and was attended by about three hundred and fifty fellows and guests. The proceedings were opened by the president, Dr. D. H. Scott, F.R.S., who explained the purpose of the meeting and welcomed the delegates and guests in a short speech. The Darwin-Wallace medal, of which we give an illustration, was then presented by the president to the seven representatives of biological science who had been selected for the honour, viz. Dr. Alfred Russel Wallace, Sir Joseph Dalton Hooker, Prof. Ernst Haeckel, Prof. Eduard Strasburger, Prof. August Weismann, Dr. Francis Galton, and Sir E. Ray Lankester, the copy given to Dr. Wallace being in gold and the others in silver. Each medallist was addressed by the president in an appropriate speech in which his claims to the distinction were duly set forth, and all were received by the audience with great enthusiasm.

Dr. Alfred Russel Wallace, in replying, spoke of the actual relations between Darwin and himself, and of the share which each had contributed to the theory of natural selection. With characteristic modesty he laid stress upon the fact that the idea had occurred to Darwin nearly twenty years before it occurred to himself. In endeavouring to explain why the same solution of the problem of the origin of species had occurred to both of them, he pointed out that a closely similar course of events had led up to the same result in each case. Both Darwin and Wallace had the passion for collecting, and both in early life had been ardent beetle-hunters. Thus they had been led to take an intense interest in the mere variety of living things and to seek for an explanation thereof. Later on both become travellers, collectors and observers in some of the richest and most interesting portions of the earth, and had forced upon their attention all the strange phenomena of local and geographical distribution, with the numerous problems to which they give rise. Then, finally, at the critical period when their minds were freshly stored with information and reflection upon the problem to be solved, both had their attention directed to the system of positive checks expounded by Malthus in his essay on population. "The effect of this," continued Dr. Wallace, "was analogous to that of friction upon the

specially-prepared match, producing that flash of insight which led us immediately to the simple but universal law of the 'survival of the fittest,' as the long-sought *effective* cause of the continuous modification and adaptation of living things."

Sir Joseph Hooker, in his address, dwelt upon the considerations which determined Mr. Darwin to agree to the proposal of his friends for the joint publication of his own and Mr. Wallace's theories by the Linnean Society. He also pointed out that at the meeting Mr. Darwin was unable to be present, being himself very ill, and with scarlet fever and diphtheria raging in his family. The meeting was the last of the session, and was unusually late owing to the death of the great botanist Robert Brown, otherwise the Darwin-Wallace paper would have had to wait for at least four months, until the beginning of the next session. The paper was actually read by the secretary of the Society. Sir Charles Lyell and Dr. Hooker said a few words to emphasise the importance of the event, but although intense interest was excited, no discussion took place—"the subject was too novel and too ominous for the old school to enter the lists before armouring."

Prof. Haeckel and Prof. Weismann were unfortunately unable to be present. The medals were received on their behalf by a representative of the Ger-

man Embassy, and a short address from Prof. Haeckel was read by the Zoological Secretary. Prof. Haeckel laid stress upon the importance of the theory of organic evolution, and described the foundation by himself of a new phyletic museum at the University of Jena.

Prof. Strasburger dwelt upon the influence of the

Darwinian teaching upon his own career and that of Haeckel, and Dr. Francis Galton replied briefly to the president's speech. Sir E. Ray Lankester addressed the meeting at greater length, and struck a fresh and appropriate note in emphasising the share taken by Huxley in the great controversy to which the Darwin-Wallace theory gave rise. He concluded by expressing the opinion that at the present day "not only do the main lines of the theory of Darwin and Wallace remain unchanged, but the more it is challenged by new suggestions and new hypotheses the more brilliantly does the novelty, the importance, and the permanent value of the work of these great men to-day commemorated by us, shine forth as the one great and epoch-making effort of human thought on the subject."

The presentation of the medals was followed by the reception of the delegates of corporate bodies. Of the colleges and schools connected with the early training of Darwin and Wallace, Christ's College, Cambridge, was represented by the master, Dr. Peile; Shrewsbury School by Mr. C. J. Baker, chief science master, and Hertford Grammar School by Mr. G. W. Kinman, headmaster. The other bodies represented were the University of Oxford (Dr. Warren, Prof. Poulton and Dr. Church); the University of Cambridge (Dr. Francis Darwin); the University of St. Andrews (Prof.



The Darwin-Wallace Medal of the Linnean Society.

Scott Lang); the University of Glasgow (Prof. J. G. Kerr); the University of Aberdeen (Lieut.-Col. Prain); the University of Edinburgh (Prof. I. B. Balfour); the University of Durham (Prof. M. C. Potter); the University of London (Sir W. T. Thiselton-Dyer); the University of Manchester (Prof. Weiss); the University of Wales (Prof. Phillips); the University of Birmingham (Sir Oliver Lodge); the University of Liverpool (Prof. Herdman); the University of Leeds (Prof. Blackman); the University of Sheffield (Prof. Denny); University College, Nottingham (Prof. Carr); University College, Bristol (Prof. Lloyd Morgan); the Royal Swedish Academy of Sciences (Prof. Lönnerberg); the Royal Society (Sir Archibald Geikie); the Society of Antiquaries (Lord Avebury); the Royal Irish Academy (Dr. Scharff); the Manchester Literary and Philosophical Society (Mr. C. Bailey); the Royal Society of Edinburgh (Prof. D'Arcy Thompson); the Geological Society of London (Prof. Sollas); the Cambridge Philosophical Society (Dr. Harmer); the Royal Astronomical Society (Mr. Newall); the Zoological Society (Mr. Boulenger); the British Association (Sir David Gill); the Entomological Society of London (Mr. Waterhouse); the Royal Microscopical Society (Lord Avebury); the Chemical Society (Dr. Horace Brown); the Malacological Society (Mr. Byrne); the British Academy was represented by Sir E. Maunde Thompson.

Dr. F. Darwin and Sir W. T. Thiselton-Dyer spoke on behalf of the universities and schools, and Prof. Einar Lönnerberg and Sir Archibald Geikie on behalf of the academies and societies represented. Prof. Lönnerberg announced that his gracious Sovereign, His Majesty King Gustaf of Sweden, had ordered him to convey to the Linnean Society his hearty greetings and sincere felicitations on this occasion. He also presented a very beautifully illuminated address from the Royal Swedish Academy of Sciences, and a silver copy of the Linnean medal of the Academy struck in commemoration of the Linnean celebrations of last year. Several other addresses were also presented by the delegates.

The concluding speech of the afternoon was delivered by Lord Avebury, who described, in an extremely interesting manner, his own intimacy with Charles Darwin, laying especial emphasis upon his peculiarly amiable personal character and upon the devotion shown by Mrs. Darwin to her husband and children. He referred to the quiet life at Down, and told the delightful story of one of Mr. Darwin's gardeners, who thought it was such a pity that his master had not got something to occupy him, for he wandered about the garden doing nothing, and would stand for as much as ten minutes at a time gazing at a flower!

After the afternoon ceremony, ninety of the fellows and their guests dined together at the Princes' Restaurant, the party including Sir George and Lady Darwin, Dr. F. Darwin and Mr. W. E. Darwin, while foreign biologists were represented by Profs. Hubrecht, Lönnerberg, Strasburger and Warming. There were no speeches, and at nine o'clock the company adjourned to the rooms of the Linnean Society at Burlington House, where a reception was held by the president and Mrs. Scott. Two short lantern lectures were delivered during the course of the evening, one by Prof. Seward on "The Jurassic Vegetation of the World: a Study in Plant-migration," and the other by Dr. Smith Woodward, on "The Evolution of Mammals in South America." Various exhibits especially appropriate to the occasion were also shown in the library. Amongst these were a beautiful series of insects from the Hope collections in the Oxford University Museum, exhibited by Prof. Poulton and Mr. J. C. Moulton, in illustra-

tion of the phenomena of mimicry and variation. Other collections of insects illustrating special points connected with the theory of evolution were exhibited by Dr. Dixey, Col. Manders, and Dr. Longstaff; while Mr. R. A. Rolfe exhibited some beautiful flowers of natural hybrid odontoglossums with their parents.

We believe the Linnean Society intends to publish a full account of the proceedings, together with the addresses and speeches, which should form an extremely interesting record of a very impressive and memorable occasion.

A. D.

THE DAYLIGHT SAVING BILL.

IF anyone is in search of an object-lesson in the necessity for the introduction of some science into general education he will do well to give his attention to the proceedings in connection with the Daylight Saving Bill. He will probably find therein so much confusion of thought that he will feel some training in clear thinking to be imperatively demanded, though there is an off chance that he will be depressed beyond recovery by the contemplation of the report of the Select Committee on the bill which appeared in the newspapers on July 3.

To begin with the original short title—the Daylight Saving Bill—it will be conceded that no action of Parliament will produce any effect upon daylight. One may save gas or electric-light, and make more use of daylight, but to talk of "saving daylight" is metaphor intelligible enough for ordinary purposes, but not suitable for legislation. When a legislative act begins with metaphor it is not matter for wonder if it eventuates in allegory, and sooner or later that must be the end of the bill.

It would conduce to greater clearness if we knew exactly what is "the principle of the bill." It is designed to make every item in "the trivial round and common task" happen an hour earlier in the summer months than in the winter, but it does not propose that. It proposes the ingenious and apparently simple expedient of moving the clocks on an hour in April and back again in September, and it is assumed that the other will be a natural consequence. Whether the purpose or the proposal of the bill constitutes its principle has never been stated. The confusion of ideas is most insinuating; a person who approves of earlier hours in summer is quite likely to find himself committed to the "principle of the bill." When the Astronomer Royal was under examination before the Committee the confusion was most evident to the looker-on. The witness was definitely opposed to any alteration of the clocks, and yet seemed to suggest that the proposal of the bill should be referred to working men. The question that he wished referred was whether they desired to be made to get up an hour earlier in the morning than they do now—there is no such proposition in the bill—not whether the designation of a particular hour of the day should be five or six—but that is in the bill and nothing else.

Cross-examination by members of the Committee turned largely upon this confusion about the principle of the bill, and upon a further confusion of ideas between having different time standards in different geographical localities and different time standards in the same locality at different times of the year. The reasoning which implies that if the one is found to be practicable objection to the other must be merely indolence or conservatism would be really worth analysis at any time of the year except the dog days. Take an example under the bill. Standard Greenwich time is to be kept for astronomical and for navigation purposes, and standard Irish time is also to be un-