

I cannot conclude this Address, Gentlemen, without again requesting you to accept my assurances of the sense which I entertain of the high honour of presiding over this Society, and of my determination to promote its interests to the utmost of my power and ability, in case it should be your pleasure to confide them again to my keeping, by electing me a second time to fill this Chair.

Report of the Council to the Anniversary Meeting on St. Andrew's Day, 1831.

The Council, to whom the Society has confided the management of its affairs during the past year, in giving an account of the manner in which they have endeavoured to discharge that trust, have in the first place to congratulate the Society upon the honour which has been conferred upon them by His present Majesty's having been graciously pleased to become the Patron of the Society, and by his having expressed a warm interest in its prosperity.

They wish, in the next place, to call the attention of the Society to the alterations they have made in the Statutes. It has for some time past appeared desirable that the Statutes should undergo a thorough revision with a view to their improvement and adaptation to the present state of the Society. The Council, anxious to accomplish this important object in the most effective manner with respect to the permanent interests of the Society, solicited the assistance of such of the Fellows as seemed to be most able, as well as willing, to give them the benefit of their valuable advice and co-operation in the performance of this difficult task. Three members of their own body having, on this occasion, intimated their inability to attend, from the pressure of other avocations, and their wish, in consequence, to retire from the Council, the Society was called upon to supply the vacancies occasioned by these resignations. The number of the Council being completed by these new elections, twenty-one other Fellows (a number equal to their own) were selected from the Society, for the purpose of composing with the Council a Committee of forty-two members for preparing the requisite emendations in the Statutes, and also for inquiring whether it might be advisable to propose any alterations in the existing Charter of the Society.

This Committee held several meetings for the discussion of these subjects. It was found upon investigation, that several improvements which were suggested could not be effected consistently with the powers granted by the present Charter: and it was finally agreed that the advantages to be expected from those changes would be more than compensated by the difficulties and expenses that would attend the procuring of a new Charter. The Committee, therefore, proceeded to direct their attention to the effecting of such emendations of the Statutes as were compatible with the powers granted by the Charter, and which appeared to afford ample means for the introduction of much improvement. Many of the Statutes which, in the course of time, had become no longer con-

formable to the practice, or adapted to the existing circumstances of the Society, were rescinded; many which required an alteration in their form were remodelled; the language in which the whole was expressed was rendered more uniform, consistent and precise; and several new regulations were introduced, calculated, in the opinion of the Committee, to promote the objects and the welfare of the Society. The result of the labours of the Committee has been the amended edition of the Statutes in the form in which they have since been printed, after having been adopted by the Council, according to the forms prescribed in the Charter, and in the former Statutes of the Society. The principal alterations that have been made in the Statutes are the following:

1. The number of Fellows whose signatures are required as proposing and recommending a candidate for election into the Society is now extended to six instead of three.

2. The times of election are now limited to the first ordinary meetings of the Society in December, February, April and June.

3. Such persons as shall in future be elected Fellows will be allowed to pay annual contributions of four pounds, as long as they shall continue to be Fellows of the Society; but no bonds, as heretofore, shall be required for enforcing these payments.

4. Lists of persons whom the Council recommend to the Society for election as Council and Officers for the ensuing year are to be prepared previous to the anniversary meeting.

5. The process of balloting for the Council and Officers at the anniversary meeting has been simplified by the employment of a single balloting list for that purpose.

6. An abstract of the Society's accounts in each year is to be prepared by the Treasurer, and printed for the use of the Fellows.

7. The duties of the Assistant Secretary and of the Librarian are now united in one person, and the office of Housekeeper is abolished.

8. Provision has been made for calling special general meetings of the Society whenever they may appear to be necessary.

9. A great extension has been given to the time during which the Library shall be accessible to the Fellows. It is now ordered to be open every day, Sundays excepted, from eleven o'clock in the morning till four in the afternoon, excepting on Good Friday, and during Easter, Whitsun and Christmas weeks.

10. Provision has been made for an annual inspection of the Library at a stated period.

The new Statutes are now printed for the use of the Fellows, and may be had on application to the Assistant Secretary.

Since these Statutes have been framed, the Council have besides adopted several specific regulations calculated to facilitate the borrowing of books out of the Library, and for ensuring their regular return at the proper period. They have also framed regulations respecting the loan of instruments belonging to the Society, with a view to the accommodation of Fellows wishing to borrow them, and consistently with their preservation in good condition.

Pursuant to the agreement entered into with the Trustees of the British Museum respecting the exchange of the Arundel manuscripts for books suited to the objects of the Society, the sum of £956 Os. 3*d.* was in July last received from the Trustees of the Museum, with the condition annexed, that the money was to be expended exclusively in the purchase of books, and that a list of the books so purchased should be sent to the Trustees. Nearly the whole of this sum has since been applied in the manner stipulated for, and the Library of the Royal Society has in consequence been enriched by a very large addition of works on scientific subjects, which had long been wanting for the supply of its deficiencies in those branches of knowledge, the promotion of which is more particularly the object of the Royal Society.

A communication has lately been received from the Trustees of the British Museum, stating that they expect to realize at least the greater part of the remaining sum due to the Royal Society, on account of the Arundel MSS. by the sale of duplicate books, in the course of the ensuing spring; and that the money so realized will be paid over without delay into the hands of the Treasurer of the Royal Society.

The Council have in the course of the last summer ordered a thorough inspection of the Library, and the accurate completion of its Catalogue, a task for the proper execution of which considerable time and labour have been required, and which is now nearly completed. With the kind assistance of Mr. Dollond, a list has also been made of the philosophical instruments belonging to the Society, and ordered to be printed for the use of the Fellows.

The increase of the Library and the probability of its future extension have rendered it extremely necessary that a more enlarged space should be obtained than that afforded by the apartments at present occupied by the Society. On this account the Council have reason to congratulate the Society on the acquisition they have lately made, by the favour of the Lords Commissioners of His Majesty's Treasury, on the application of His Royal Highness the President, of the rooms lately occupied as the Privy Seal Office.

On a representation made to the Council of the advantages to be expected from the application of the optical principle developed by Mr. Barlow, to the construction of a telescope of large dimensions, the Council appointed a Committee of inquiry into this subject; and having received from them a report favourable to the success of the measure, have given orders to Mr. Dollond to execute a telescope of that description under the superintendence of Mr. Barlow.

The Council have also to announce that they have placed the papers containing the magnetical observations made by the late lamented Capt. Foster in his recent voyage of discovery (and which have been transmitted to the Royal Society by the Lords Commissioners of the Admiralty), in the hands of Mr. Christie, who has obligingly offered to examine them, and has undertaken to condense them with a view to publication by the Society.

The Council being desirous of obtaining authentic documents respecting the tides, applied to the Admiralty for accounts of the rise and fall of the sea, and the exact periods of high and low water at the different sea-ports. Orders have in consequence been given to the proper officers of the Dock-yards at Woolwich, Sheerness, Portsmouth, and Plymouth, to make these observations, and returns have already been received from those places. The Chairman and Directors of the London Dock Company have presented to the Society the books containing a complete series of original observations on the tides, referred to in a paper read to the Society on that subject by Mr. Lubbock; for which favour the Council have returned suitable acknowledgements.

Considerable uncertainty having prevailed with regard to many points relating to the powers entrusted to the Society of conferring certain honorary rewards, and also as to the principles which should guide them in making the several awards of those honours, the Council appointed a Committee for considering the whole of this subject. The Committee, in the execution of this task, have made a diligent search for all the documents relating to these subjects, including the extracts from wills and other authorities, and the resolutions which have from time to time been made by the Council relating to the medals; and have directed that separate lists should be made out of all the persons who have received the honorary rewards bestowed by the Society, specifying the respective dates and subjects for which they were awarded. Their exertions have been ably and diligently seconded by the Assistant Secretary; and the Council have directed that the account which Mr. Hudson has drawn up shall be printed for the use of the Fellows.

The Council, on the recommendation of the Committee, have adopted the following regulations as to the mode of making the several awards entrusted to them.

1. The Copley Medal shall be awarded to the living author of such philosophical research, either published or communicated to the Society, as may appear to the Council to be deserving of that honour. The particular object or subject of research, on account of which the medal is awarded, shall be specified in making the award. No limitation shall exist either as to the period of time within which that research was made, or to the particular country to which its author may belong. It shall not be awarded to any person who is a member of the Council at the time when the award is made. The medal may, as was formerly done, be given more than once to the same person, if the Council deem it expedient so to mark their high sense of the merit of the author. The medal shall, as far as circumstances permit, be awarded annually.

2. No change is made in the mode of awarding the Royal medals, formerly resolved upon by the Council.

3. At the first meeting of the Committee of papers held in each year, some one paper then in the hands of the Secretaries, and intended to be read to the Society, shall be selected as the Bakerian Lecture for that year.

Inconvenience having arisen from the collection which the Porter has hitherto been in the habit of making from the Fellows of gratuities for the delivery of the Lists of the Society, the Council have now ordered that from the day of the next anniversary, he shall receive, in lieu of such gratuities, and of his former salary, a salary at the rate of £60 per annum.

The Copley Medal has been adjudged to Professor Airy of Cambridge, for his papers on the construction of the Achromatic Eye-pieces of Telescopes, and on the Achromatism of Microscopes; on the Spherical Aberration of Eye-pieces, and for his other papers on optical subjects in the Cambridge Philosophical Transactions.

The rules for the practical construction of eye-pieces, which were chiefly formed by the elder Dollonds, were probably deduced by repeated trials, conducted with the usual skill and sagacity of those great opticians, rather than by any very accurate reference to their mathematical theory: in whatever manner, however, they were discovered, they have continued to be adopted by opticians with very little alteration since that time.

The correction of the spherical and chromatic aberration of eye-pieces is at least as important in practice as those of object-glasses; and whilst the theory of the latter has been more than once subjected to a complete analysis, that of the former has been almost altogether neglected. The elaborate and complicated formulæ of Euler are altogether useless for the present constructions; and the more practical investigations of Boscovich, though opening the way to more accurate results, have failed to satisfy the required conditions. Professor Airy, by a more accurate analysis of the theory of oblique pencils of rays, and by connecting his investigations more strictly with the practical conditions of the problem to be solved, has been enabled not merely to satisfy the common constructions and the rules for effecting them, but likewise to point out other constructions with their corresponding rules; and though such constructions have been found, upon trial, to be at least not superior to those which are already in use, it must always be considered as an important step in the advancement of science, that theory should be at least coextensive with practice, and should become a leader and a guide to the latter, instead of a follower in its train. But though the Council have selected the papers on the theory of the correction of the chromatic and spherical aberration of eye-pieces, as forming the principal ground of their decision, yet they are anxious to combine with them other papers in the same Transactions, as deserving of particular commendation, and as showing the profound acquaintance of their author with every branch of optical science. Amongst these may be mentioned the paper on the Double Refraction of Quartz, which is of very recent publication, inasmuch as it affords one of the most striking *à posteriori* proofs which have hitherto been discovered of the truth of the undulatory theory of light; a most difficult mathematical investigation, essentially founded upon that theory, leads him to expect the appearance of phenomena of great beauty and intricacy, as the result of certain experi-

ments which are found upon examination to be almost mathematically exact. It is by such tests, and many others reproducible, that the truth of the theory, which was established and developed by the genius of Young and of Fresnel, becomes established upon evidence scarcely inferior to that of universal gravitation.

The Society next proceeded to the Election of the Council and Officers for the ensuing year, when the following was declared to be the list:—

President.

His Royal Highness the Duke of Sussex, K.G.

Treasurer.

John William Lubbock, Esq. M.A.

Secretaries.

Peter Mark Roget, M.D. John George Children, Esq.

Foreign Secretary.

Charles Konig, Esq.

Other Members of the Council.

Peter Barlow, Esq.	William George Maton, M.D.
John Bostock, M.D.	Roderick Impey Murchison, Esq.
Rev. William Buckland, D.D.	Rev. George Peacock, M.A.
Samuel Hunter Christie, Esq. M.A.	George Rennie, Esq.
Rev. Henry Coddington, M.A.	Captain William Henry Smyth,
Charles Daubeny, M.D.	R.N.
George Dollond, Esq.	Nicholas Aylward Vigors, Esq.
Davies Gilbert, Esq. M.A.	M.A.
Joseph Henry Green, Esq.	Rev. William Whewell, M.A.