

ology, aerial navigation, and allied subjects, with the particular object—as we gather from the circular convening the congress—of promoting the methodical and general observation of aerial currents. Authorities propose, but contributors decide, the result and character of the meeting, and the *compte rendu* of the congress, which has just reached us, shows that while a variety of interesting topics was brought under the notice of the members present, and discussed with greater or less detail, the ultimate aim of the promoters does not seem to have been materially advanced. Of course, the awakening of public opinion and the diffusion of information are always desirable, and the Committee responsible for the congress are to be congratulated upon the general success which has attended their efforts, though it may not be precisely in the direction they proposed to themselves.

One circumstance certainly told against the development of any complete plan, demanding the co-operation of many nationalities. The date of the congress (August 16–18) was unfortunately chosen. It clashed with the meeting of professional meteorologists, who were in session at Upsala, and thus prevented the attendance of those who could have given authority to any well-considered scheme, whose guidance would have been welcome, and whose reputation would have added weight. The President (Lieut.-General Wauwermans) had to announce, therefore, many letters of apology for non-attendance from men of science who had hoped to be present. His address was in the main historical, dealing with the progress of aeronautics and ballooning from the time of Montgolfier to the present, and a consideration of the benefits that would accrue to many mechanical applications from the more perfect knowledge of atmospheric motion and aerial currents. This address was delivered to the whole congress, which afterwards divided into two Sections—one, under the presidency of M. Lancaster, to discuss the subject of aerial currents; the other, directed by M. Van den Borren, more immediately concerning itself with aerodynamics.

To the first Section, M. Lagrange contributed a paper on the sympathetic movements of freely-suspended needles, whether magnetised or not. These practical experiments are the outcome or completion of a mathematical inquiry, published by the author in 1892, entitled, “*Étude sur le Système des Forces du Monde physique.*” The experimental inquiry has been spread over more than two years; while two sets of apparatus—one in the cellar of the observatory, the other on a level with the ground—have been under observation. The direction in which the needles point is not constant; but both sets show a tendency to travel in azimuth from north-west to south-east from April to June, and then to retrograde towards the original position. The reason for this oscillation is discussed at great length; the author attributes it to the mechanical conditions under which a permeating fluid similar to ether would be placed when affected by all the forces, gravitational and electrical, that are continually operative. The practical result is, that further observations, conducted at a depth 30 metres below the surface, are to be prosecuted at the Royal Observatory, Brussels, and a member of the congress will carry out similar observations at the Meteorological Institute of Roumania. Canon Spée discussed the well-worn question of a possible connection between the area of spotted surface on the sun and the temperature of the earth, and, like others before him, is driven to the conclusion that any connection is not apparent. The meeting closed with a new theory of tides, both oceanic and atmospheric, but the “new” theory was not well received, and is not described in the *Compte rendu*.

At the second meeting of the Section, some papers of minor importance were read and discussed. One member read a note on the treatment of diseases of the ear by compressed air, and invoked the aid of meteorologists in a matter of aero-therapeutics. Another had something to say on the forces that affect the rotation of the earth, but this was summarily dismissed as a theory “qui aboutit à la fois à des déductions d’ordre scientifique et d’ordre philosophique.” Another had arranged a system of magnetic needles with a view to the solution of the problem of weather prediction. The subjects, it will be seen, were sufficiently varied; we can only refer to two. One, by M. Lancaster, on the preparation of synoptic charts, in which he insisted on the regular publication of maps showing atmospheric currents. He indicated the progress that had been made in investigations of that character, and suggested the formation of an international bureau for the consideration of the subject. A vote of the con-

gress supporting his views was forwarded to the Meteorological Congress sitting at Upsala.

M. Plumandon, meteorologist to the Observatory of the Puy de Dome, read a paper on the causes of storms and atmospheric disturbances. He had availed himself of the difference of altitude of the Puy de Dome (1467 m.) and of Clermont Ferrand (388 m.) to compare the variations of barometric pressure at the two levels. In summer the pressure is raised less above or falls more below the mean value at Clermont than at the summit of the Puy de Dome. The opposite rule obtains in the winter. M. Plumandon deduces from his discussion that the production of storms coincides with the greatest separation of the two barometric curves, and that storms cease when the separation is sufficiently small. Put otherwise, this means that storms occur when the ascending currents reach a sufficient intensity, and, further, that absolute values of the pressure are of less importance in producing storms than the magnitude of the separation of the barometric curves at a high and low level. M. Plumandon has also interesting remarks on the relative velocities of wind at high and low stations in the same district, derived from observations at Pic du Midi and Toulouse, at Tour Eiffel and Parc Saint Maur, Paris, and other places, from which it appears that the higher station does not always suffer most from violent winds, but that there are regions at considerable altitude where the air is on the whole less agitated than at the surface of the ground.

In the Section devoted to aerodynamics, M. Van den Borren gave an able address on the subject of aerial navigation as it stands to-day, enriched by the experiments of many able mechanicians. M. Borren, as chief of the military aerostatic service of Belgium, and having charge of the School of Aerostation at Antwerp, was able to give an interesting account of what had been there accomplished under his own eye. Experiments have been carried on to determine the resistance offered by the air to planes at different inclinations, and to surfaces of various figure, as well as to the preparation of machinery arranged for different rates of locomotion and constructed of various materials with the view of determining the friction of the air on different substances. That is to say, the problem has been studied with all the attention that experience has suggested, and the conclusion to which this expert arrives is, that the problem of aerial locomotion no longer presents any serious difficulties, that the theory is satisfactorily established, and that one may venture to proceed to execution. Neither does size offer any insuperable objection to this optimistic view. He calmly contemplates the manufacture of an aerostat 300 metres long by 30 broad, dimensions which approach, if they do not exceed, those of an Atlantic liner. An historical sketch of the progress of meteorology closed the sitting.

At the second meeting, M. Lancaster gave an account of the observations on the velocity of the wind in Belgium. In the main the author agrees with the results to which M. Hann, of Vienna, had been previously led. The paper, which is of great interest, appears in full in an annexe, forming the second part of the *Compte rendu*, being the memoirs presented to the congress. Another paper, to which we give only a brief reference here, is from M. Ventosa, astronomer at the Observatory of Madrid. It has for its object the determination of the direction of wind at high levels from observation of star images, and also that of the sun. This subject came before the meteorological committee at Upsala, and seems to have been well received, since M. Ventosa was encouraged to continue his observations (see NATURE, vol. li. p. 185; also p. 179 of this number).

THE HUXLEY MEMORIAL.

THE following is the official report of the first meeting of the General Committee, formed for the purpose of establishing a memorial to the late Right Hon. T. H. Huxley, P.C., held in the Museum of Practical Geology, Jermyn Street, on Wednesday, November 27, 1895. Present—250 Home Members of the General Committee. His Grace the Duke of Devonshire, K.G., in the chair.

The Duke of Devonshire, in opening the proceedings, said:—My Lords and Gentlemen,—It would be in the highest degree presumptuous on my part if I were to attempt, in the presence of so many distinguished men of science as I see around me, to offer anything in the nature of an estimate of the character and work of Prof. Huxley, or of the services which he has rendered

to science, either as an original investigator or as an exponent. As, however, I presume that it is as the official head of the Science and Art Department that I have been asked to accept the chairmanship of this Committee, it may be proper that I should open the proceedings by a very brief statement of the official connection of Prof. Huxley with that Department, although I am perfectly aware that the services which he rendered to that Department, valued and valuable as they were, form but a very small part of the work which Prof. Huxley did for science; which, both during his lifetime and since his death, has been so fully recognised by every scientific man in the country.

Prof. Huxley, immediately after leaving the Navy, in which he commenced his career, succeeded in 1854 Prof. Forbes, as Lecturer on Natural History in the Central School of Science in Jermyn-street. This school subsequently became the Royal School of Mines. It was transferred to South Kensington in 1881, and there merged in the Royal College of Science. Prof. Huxley was the first Dean of the College, and on his retirement from the public service in 1885, he was requested by the heads of the Department to retain the office in an honorary capacity. This he did, to the day of his death; attending the meetings of the Council, and giving assistance in other ways. He was also Honorary Professor of Biology in the College, retaining a general charge of the biological section. While Professor at the College he developed his system of biological teaching—which has had so marked an influence on biological teaching in all parts of the world. On his retirement in 1885 he presented to the College the large and valuable collection of books on natural history which he had formed. The room which he occupied was, by the authority of the Lords of the Committee of Council on Education, devoted to a Huxley Biological Laboratory for research, and it is in constant use by advanced students of biology. A scholarship has been endowed in connection with the College, and the history of that endowment may be of some interest. Prof. Huxley on one occasion met in society Miss Marshall, the daughter of Mr. Matthew Marshall, for many years Chief Cashier of the Bank of England, and in consequence of a conversation which she had with Prof. Huxley on that occasion, she left to the Department a large number of books and instruments and, in addition, a bequest of £1000, from the proceeds of which the scholarship referred to has been endowed.

Prof. Huxley was, for more than forty years, intimately connected with the Science and Art Department. The Jermyn Street Museum, in which we are met to-day, is a section of that Department, and both in this lecture-theatre and in the classrooms upstairs, Prof. Huxley for many years delivered his lectures.

It was almost my first duty—and I need not say, my painful duty—after I became President of the Council, to address (on the part of the Committee of Council on Education) a letter of condolence to Mrs. Huxley, in which the Committee placed on record its high appreciation of the services to science and art rendered by Prof. Huxley in the capacities to which I have referred, and in addition, on many inquiries by Royal Commissions, in which he had taken part. I am quite aware that the time of those who are here is valuable, and I shall, therefore, not detain you any longer, but must leave to others the duty of expressing the recognition of the whole of the scientific world of the brilliant life and labours of Prof. Huxley. I have thought, however, that this brief reference to the official side of Prof. Huxley's career might not form an inappropriate introduction to the wider view of his work and of his character, which it will be the duty of those who are to follow me to present to you.

Prof. M. Foster (Joint Honorary Secretary of the Provisional Committee), after referring to a number of letters expressing regret at being unable to be present at the meeting, gave a brief history of the movement for establishing a memorial, as follows:—

Very shortly after the death of Prof. Huxley, a few of his personal friends met together in the rooms of the Royal Society; they thought they would be carrying out the wishes of all by promoting such a memorial, and invited a number of representative and influential persons to meet to consider the matter. They met, and it was then thought desirable to take further steps; they therefore constituted themselves a Provisional Committee, and sent out invitations to a very much larger number of persons to form a General Committee. These invitations were very cordially received, and, among others, we had the pleasure of hearing from H.R.H. the Prince of Wales that he would

join the Committee, and would, further, accept the duty of Honorary President. At that time the summer was too far advanced to take any active steps, and the meeting of the General Committee was postponed until the present date. In the meantime we approached his Grace the Duke of Devonshire, asking if it would be his wish to act as Chairman of the Committee, and his Grace kindly accepted this duty. The Provisional Committee have given much time to the consideration of various suggestions made as to the form which the proposed memorial should take; and certain resolutions, embodying the decisions arrived at, will be submitted to you; and it is for you to decide how far they shall be carried into effect.

Lord Kelvin, P.R.S., then proposed the first resolution:—

“That it is desirable to establish a memorial to the late Right Hon. Thomas Henry Huxley.”

He said:—As an original investigator in biology, Huxley has, by his life-long perseverance in working for the increase of natural knowledge, left to the world a monument more enduring than any bronze or marble in which his survivors may give material expression to their gratitude. Of his originality he gave early proof. Whilst still a student in Charing Cross Hospital, he made an exceedingly skilful and acute microscopic investigation of the structure of hair; he discovered a special structure, and described it in a communication to the *Medical Times and Gazette* with so much effect that, to this day, it is known as “Huxley's layer.” That was something for a young medical student to have done. His indomitable resolution to go on with work; his attraction to original investigation—an irresistible passion of his through life—was manifested from beginning to end. Soon after his technical school education in medicine was completed, he went away as medical officer to the *Rattlesnake*, on a four years' cruise. Happily, his medical duties left him some leisure; that leisure he employed in a series of most important investigations in natural history, which has made the cruise of the *Rattlesnake* celebrated in the annals of science. I cannot tell you how many memoirs he sent home from the *Rattlesnake*; some of them never came back; one he found on his return, in the shape of a memoir communicated to the Royal Society and published in its *Transactions*; it is known to all naturalists, and is admitted to be a very valuable and important paper. Several other papers were sent, including one very important paper—although it only occupies half a page of the Report of the British Association—dealing with the blood corpuscles of certain marine animals picked up in the surveying work of the *Rattlesnake*. These first works done, not in a scholastic manner as a thesis for a Degree of Philosophy, but simply from the innate fire and determined purpose of the worker, were but the beginning of a long series of memoirs which soon made the name of Huxley famous throughout the scientific world. He was very early recognised to be one of the first biological investigators of the day, and the value of his work will be declared to you by others who know thoroughly the merits of the work and the wants which that work supplied in natural science. They will tell you that his work in Comparative Anatomy was of very great value indeed; that he almost created a new era in biological science, by the great advances that he gave to the new Morphology. He carried out and extended, in the most admirable and valuable manner, the work of Von Baer and Johannes Müller, tending in this direction, and now we have—what medical students and students of natural science in Huxley's student-days could learn nothing of in school or university—we have Morphology and General Biology taught regularly and systematically; and, I believe, I may safely say, not only to the great benefit of medical science, but to the great benefit of science in general; to the great benefit of those who are studying science for the sake of knowledge and of opening their minds, and of understanding the grandeur and beauty of nature and what lay underneath it.

Huxley's work was not confined to microscopic examination and the dissection of plants and animals—comparative anatomy generally, including the vegetable world—although it began with that. He entered on the subject of geology and of palæontology in a manner which has left fruit of a most enduring character, especially in palæontology: his tracing of relationships, and his philosophical reasoning regarding these relationships, which led him to find in the rocks the ancestors of many creatures now living on this earth, and his contributions to the great and newly-developed science of evolution, are so well known that I need only name them to at once remind you

who have entered on that subject how much science owes to Huxley. But Huxley was not a man who was only a specialist, simply content to investigate his special subject in the complete and thorough manner which characterised all his work. From the very beginning he had a mind that must extend into philosophic thought. His moral lessons from his biological work extended even into the field of politics, and his contributions to thought in respect of theology, in themselves are such as to put Huxley's name and fame in a very high position indeed, as a man thoroughly determined to give all the benefit he could to mankind. As a worker who gives his life, who sacrifices his health, who sacrifices his time, who gives up everything for the advancement of science; but, as he tells us himself, with an object which he felt to be even greater than the advancement of science, the promotion of the welfare, moral and material, of mankind: who deserves a memorial or a monument better than Huxley?

The Right Hon. A. J. Balfour, M.P., in seconding the resolution, said:—

I gladly welcome the opportunity which the managers of this meeting have given me of lending such support as I can to the proposals that have been laid before you, for Prof. Huxley was a man who had many titles to our gratitude. I need not dwell upon what your Chairman has said with regard to Prof. Huxley's services as a teacher, or to the services he constantly gave to the Government of the day in lending his great talents to any investigations that were required of him. But putting all these relatively subordinate matters out of mind, Prof. Huxley, as a man of letters, and as a man of science, surely deserves from his fellow countrymen some permanent memorial. Every one whom I am addressing is probably well acquainted with those works which, quite apart from the matter which they contained, have earned for their author the reputation of being a master of clear, lucid, and vigorous exposition, not easily to be matched in the whole gallery of our literature. Lord Kelvin, in the observations which he has just made to you, and others far more qualified than I am to speak on such subjects, who will address you before the meeting closes, will give some indications of the great extent of the scientific labours and discoveries which will always be associated with Prof. Huxley's name. For my own part, however, if I were to try to choose among the many titles to our gratitude which he possesses, I am not sure that I should seek for it either in his literary performances, distinguished though they were, or in the series of scientific discoveries which have given him so distinguished a place among English biologists. It appears to me that Prof. Huxley has another claim, at least as great upon the gratitude of those who were born in the generation subsequent to that of Darwin. I take it that the great scientific fact of the latter half of the nineteenth century is the establishment of the doctrine of Evolution upon a scientific basis. I do not pretend to say for a moment, that in his labours in that direction, Prof. Huxley could be put upon a level with the great scientific originator of the doctrine of the Origin of Species, or with a very different and very eminent man—Mr. Herbert Spencer, who occupies so remarkable a position upon the borderland between science and philosophy. But this, I think, may truly be said, that in the critical period of scientific history which followed the publication of the "Origin of Species" in 1857, the man who did, perhaps, more than any other to stimulate public interest in the subject, to bring into line all the younger scientific thinkers of the day, to inspire them with his ardour, and with his convictions, was, probably, Prof. Huxley. That is no small title to fame. If it be the fact, that it is now the common privilege of all educated men to look at this material world in which we live, from the evolutionary standpoint, we owe it not merely to the great original investigators who started the theory, but to those who, like Prof. Huxley, did so much by their scientific discoveries to support it, or even more by their scientific preaching and their example, to spread it among all classes of their fellow countrymen. There were other questions never far absent from the mind of Prof. Huxley, as any one who knows his work will admit, as to which he has left few positive results, and concerning which differences of opinion exist; but there is, or there ought to be, no difference of opinion as to that great claim on our consideration which I have mentioned, and this, even if it stood alone, dissociated from his literary and strictly scientific work, it would, in my judgment, be quite sufficient

ground for our using every exertion to carry into effect the resolution which it is my honour now to second.

Lord Playfair, in supporting the resolution, said:—

It is scarcely necessary to say one word in regard to the eminence and the scientific position of Prof. Huxley, but it has been my privilege to be associated with him in many of his undertakings and labours as a public man. I was a Professor with him in this Institution, and had the pleasure of having him as a colleague in many public inquiries and on various Royal Commissions for the benefit of the public. In higher education, the Scotch University Commission benefited by his wise counsel and breadth of culture. The present position of technical education also owes much to the advocacy and the scientific lectures which Prof. Huxley gave through the country. There is one labour in which to the time of his last illness, I had great pleasure in being associated with him—that was in the establishment of scientific scholarships of £150 a year in almost every college and university, not only in the United Kingdom, but in the Empire of India and throughout all our Colonies. That was a subject very dear to Prof. Huxley's heart, and although he was not much engaged in the executive part of it—which fell to my share as a Commissioner for the Exhibition of 1851—Huxley was a much-valued adviser in all matters relating to the establishment of these scholarships. They are all Research Scholarships, and are now exercising a benign and important influence over the science education of our great Empire. One whole autumn I had the pleasure of being in a gunboat with Prof. Huxley—being both on the Royal Commission for the examination into the fisheries of the British Coasts—and it is scarcely necessary to say he was a most active and valuable member of that Commission, both from his scientific knowledge and in estimating the value of the evidence of the fishermen in various parts of the fishery coasts of England. I do not, in speaking of his labours as a public man, wish to overrate them in comparison with his scientific work. On the contrary, I think discoveries in abstract science are of far greater importance to humanity than any labours performed for the particular generation in which the man lives. Still his public work had a great effect in making the name of Huxley popular and beloved by the people of this country; and we are entitled to ask the people for whom he has done so much in his generation—for he has left England better than he found it—to join us in making a memorial worthy of this great man whose memory is a possession dear to the country.

The resolution was then put to the meeting and carried unanimously.

Sir Joseph Hooker (Chairman of the Provisional Committee) moved the second resolution:—

"That the memorial do take the form of a statue, to be placed in the Museum of Natural History, and a medal in connection with the Royal College of Science, and that the surplus be devoted to the furtherance of biological science in some manner to be hereafter determined by the Committee, dependent upon the amount collected."

He said: As Chairman of the Provisional Committee, appointed to consider the question of a fitting testimonial to the great services to science and education of Mr. Huxley, I have the honour of saying a few words in regard to the result of its deliberations. Before doing this, you must allow me to express the singular honour I felt in being appointed to that position of Chairman, not only because of the great and important duty, but especially because of my great, long, and enduring affection and regard for Prof. Huxley. We both entered the public service as assistant surgeons and volunteer naturalists in the Royal Navy. Before Prof. Huxley went out in the *Rattlesnake*, the choice lay between us for the appointment to that vessel, and, fortunately, the choice fell upon him. Immediately upon his return a strong friendship sprang up between us, which has lasted forty-five years, throughout which he has been one of my staunchest and firmest friends. This friendship has affected me through life, and I owe a great deal of my success in scientific life to the advice, the stimulus, and the example which Prof. Huxley set me during a long career. After what has already been said by previous speakers, it would be a work of supererogation for me to go into any detail as to the great value of the services of Mr. Huxley, whether to science or education. You will be pleased to hear that these are appreciated, even more abroad than in this country: although if pleased in one sense, I

am afraid you will not feel satisfied in another. In a notice put into my hands by the Secretary, I find the Committee includes over 700 names; a special feature of it is the high percentage of acceptances from foreigners, which exceeds that from home sources, but I hope this state of things will be speedily remedied. Many of the foreign acceptances have been accompanied by letters expressing the highest admiration for Mr. Huxley, and good wishes for the success of the memorial.

With regard to the duties of the Provisional Committee, I need not say there were a great many proposals laid before them. It is unnecessary to go through these proposals, but they received the greatest attention. They may be grouped under four heads:

- (1) A statue to occupy a public position.
- (2) The founding of Exhibitions, Scholarships, and Medals for Biological Research, &c.
- (3) The founding of Lectureships, &c.
- (4) The republication of Prof. Huxley's Scientific Publications, in a collective form.

This last proposal has, I am glad to say, been partly met by a most liberal offer made by Messrs. Macmillan, who are prepared to publish, at their own risk, in a collective memorial form, the scientific papers of the late Mr. Huxley, now scattered over the publications of various learned societies and periodicals, provided that the size does not exceed two or three volumes of royal 8vo.; all we have to do being to appoint some one to supervise this invaluable series of papers. With regard to the memorial, the Committee decided to recommend that it should take the form of a statue and a medal, as now set forth in the resolution proposed.

Mr. Leslie Stephen, in seconding the resolution, said:—

I must preface the few words which I have to address to you, by saying that I had to overcome a certain degree of reluctance in addressing myself to you to-day—I did, however, overcome that feeling—because I feel that I am under the stress of a strong sense of personal gratitude to Prof. Huxley. I knew him for, I think, nearer forty than thirty years, and during our intercourse it happened, more than once, that he was able to show kindness to me on occasions in which kindness is doubly valuable, and on which one acquires a considerable degree of power of discriminating between merely conventional courtesy, and the outpourings of a warm, cordial heart. One of these occasions happened only recently; and I have so keen a recollection of Huxley's kindness and cordial sympathy, that I could not refuse to come here to say a few words to-day. I know that I am only saying what is felt by all who knew him, that he was a man who was not only to be honoured for his intellectual power, but to be loved for his masculine and affectionate nature. But qualities of that kind are happily not so rare as to demand any public testimonial. Only when they are combined with others, it is not merely a duty, but a privilege to seize any occasion of paying what honour we can to their possessor. I will not, however, dwell upon them; and, still less, upon those claims of Huxley as an advancer of science, of which there are other incomparably superior witnesses present. There is one point on which I, perhaps, may say a word or two without presumption. I have had the misfortune to be compelled to devote the greatest part of my energies to books, and only to see facts through the distorting medium of literature. It fell to my lot lately to read through the collected works of Prof. Huxley, and when I came to the end I felt a conviction—which Mr. Balfour has already expressed—that when the history of his time comes to be written, Prof. Huxley will find a place not only among the leaders in the most characteristic movement of the time, but also as one of the very first writers of English. There are certain reasons, perhaps, why his claims in that capacity may not be acknowledged so quickly as they ought to be by the ordinary critic. Nobody, of course, can read his lectures without admiring the force and vigour of the great intellectual gladiator. One feels of his style what I remember Hosea Biglow says, in a different connection, that—"for putting in a downright lick betwixt the eyes of humbug, none could match it." But then the critic of the present day is apt to take account only of what he calls "form," and not to attend and to dwell upon the more evanescent and indirect, intangible facts of literature; he is apt to think that the facts state themselves, that the thing is so clear it does not want any particular skill to work it out. The argument, when it is set going, seems to evolve of its own accord, and then he criticises in the style of the famous gentleman, who said, of some great work, "I could have written

it myself, if I had only had a mind to." The obvious retort was—"it was just *mind* that was wanted." And what a style like Prof. Huxley's—which calls no attention to itself, but just sets the argument plainly before it—what that shows is certainly the possession, in the first place, of a clear, logical understanding, which always goes to the heart of matter; but it shows also, I think, some other great qualities. One cannot help observing the love of fair-play, which prevents him from ever striking a foul blow, and his loyalty to his friends, which gives a glow and warmth to his style, in standing up for such a man as Darwin for example; and besides that, the unflinching love of truth, the hatred of throwing dust in other people's eyes or letting it obscure his own, and, finally, what has been most truly noticed already, his strong preoccupation with the greatest and deepest problems of the time which, however they may be solved, whether in his sense or any other, require to be approached in a manly, serious spirit, as he always approached them. These, as I take it to be, very shortly are the mental and moral qualities which will give to Huxley's writings a place not only in science, but in the best kind of English literature, and in that faith it gives me the greatest pleasure to be allowed to have the honour of seconding this motion.

The resolution was then put and carried.

Mr. Alma Tadema moved the third resolution:—

"That the persons named in the list which has been circulated do form a General Committee, and that the following twenty persons be selected to form an Executive, with power to elect its own Chairman, and to add to the number of the General Committee:—

SIR W. BESANT.
SIR J. DONNELLY, K.C.B.
SIR J. EVANS, K.C.B., F.R.S.
SIR J. FAYRER, K.C.S.I.,
F.R.S.
SIR W. H. FLOWER, K.C.B.,
F.R.S.
PROF. M. FOSTER, F.R.S.
PROF. E. FRANKLAND, F.R.S.
SIR A. GEIKIE, F.R.S.
SIR J. HOOKER, K.C.S.I.,
F.R.S.
PROF. E. RAY LANKESTER,
F.R.S.

SIR J. LISTER, BART., P.R.S.
PROF. J. N. LOCKYER, C.B.,
F.R.S.
LORD RAYLEIGH, F.R.S.
MR. BRITON RIVIERE, R.A.
DR. P. L. SCLATER, F.R.S.
LORD SHAND.
SIR H. THOMPSON.
MR. SPENCER WALPOLE.
THE RIGHT HON. SIR J. LUB-
BOCK, BART., M.P., K.C.B.,
F.R.S., *Hon. Treasurer.*
PROF. G. B. HOWES, *Hon.*
Secretary."

He said:—It would be presumptuous in me, a painter, after all you have heard and all you know about the departed friend, to say any more to you as to why humanity owes so much to that giant of science. But you know that, in England, science and art are merged together. We have our department, and so I have a certain right to say a few words. As it has been already so rightly remarked, Prof. Huxley was a man of innate worth and energy: when you were in his presence you felt as if you were sitting in the sunshine, and sunshine is the life of an artist. Besides that, he loved art, and art flowed in his blood, as you know so well, because one of his daughters was a first-class artist.

Sir Andrew Noble seconded the resolution, which was carried unanimously.

Prof. G. B. Howes (Joint Honorary Secretary of the Provisional Committee) announced that the sum already received in donations to the memorial was £213, and that £344 more was promised, making a total of £557. The donations included £100 from Andrew Carnegie, Esq.; £100 from J. Allsop, Esq.; and £50 from the Marquis of Salisbury.

Sir John Evans proposed that a hearty vote of thanks be given to his Grace the Duke of Devonshire for his kindness in presiding at the meeting.

Sir J. Fayrer seconded the resolution, which was carried unanimously.

The Duke of Devonshire, in reply, said:—I can only say I am very much indebted to you for the cordial vote of thanks you have been so good as to pass to me. I need not repeat what I said in opening these proceedings—that I feel as fully as any one present can possibly do how entirely deficient I am in any claims of a personal character to occupy the distinguished position for which I have been selected. I think, however, it is perfectly right that some member of the present Government of the country should be associated with a movement of such national interest and importance as the present one, and I am aware that, as the Minister

who is responsible for the Education Department of Government, I am, perhaps, officially designated for this position. I need hardly say that I shall find it somewhat difficult to give very constant attention to the duties which will devolve upon the Committee. I trust, however, that the General Committee will be relieved of any work of a detailed character by the Executive Committee which you have just appointed. However, I can only assure you that any further services which I am able to give to this cause will be very cheerfully rendered, and I think I may conclude by congratulating you on the character of the proceedings which have taken place this afternoon. I assure you I feel it a very high honour indeed to have been permitted to preside on such an occasion, and over a meeting containing so many distinguished persons as those who have assembled here this afternoon.

The meeting then adjourned.

Since the meeting of the General Committee, two meetings of the Executive Committee have been held. At the first of these, at which Lord Shand accepted the office of chairman, it was reported that a number of foreigners of eminence had expressed a wish to be associated with the proposal to commemorate Mr. Huxley's distinguished services to humanity. It was resolved, in the first instance, to invite subscriptions from the members of the General Committee. At the second meeting, held on Wednesday last, it was reported that the subscriptions, which at the general meeting had amounted to £557, had been increased to about £1400, and it was resolved that a wider appeal for subscriptions should now be made to the friends and admirers of Mr. Huxley amongst the general public. The Honorary Secretary stated that in America committees were in the course of being formed to promote the realisation of an adequate Fund. The Committee resolved to communicate, by means of a Sub-Committee of their number, with Mr. Onslow Ford, R.A., who had the advantage of being well acquainted with Mr. Huxley, in reference to the statue, which it is proposed should be erected beside those of Darwin and Owen in the Natural History Museum, South Kensington. The extent to which the Committee may be able to carry out the other intended objects of founding exhibitions, scholarships, and medals for biological research and lectureships, and possibly in assisting the republication of Mr. Huxley's scientific works, will of course depend on the subscriptions which may now be received. These may be sent to the Treasurer, Sir John Lubbock, or the Bankers, Messrs. Robarts, Lubbock, and Co., 15 Lombard-street, E.C.; or to the Secretary, Prof. G. B. Howes, Royal College of Science, South Kensington.

The amount received to December 20 was £1535.

The court of the Fishmongers' Company, in consideration of the eminent and important services rendered by Huxley to the cause of technical education, has agreed to give a scholarship of £60 per annum to the City and Guilds of London Technical College, Finsbury, to be called "the Fishmongers' Company's Huxley Scholarship," to be held for three years by any scholar who has given evidence of high scientific attainments, to enable him to proceed to the Central College at Kensington.

RELATIONS OF THE WEATHER BUREAU TO THE SCIENCE AND INDUSTRY OF THE UNITED STATES.¹

IT is a matter of much pleasure to me that I am allowed the privilege of speaking at a joint session of this Association—representing as it does within the confines of its admirable organisation the scientific thought of our country. This is the Mecca towards which annually journey all those who wish, each to contribute his mite to the sum of human knowledge; each inspired with an ambition to add even one flickering ray to the great luminous orb which to-day is shedding the benign light of wisdom even unto the uttermost recesses of the earth; subduing the barbarous instincts of man, and warming and invigorating into life the better impulses of his nature. Thus is civilisation advanced, and thus is humanity elevated to higher and higher planes of existence.

I hope to be a worker in the ranks of this great army, and as the science of meteorology can hardly be said to have passed

¹ Read before the American Association for the Advancement of Science, at the Springfield Meeting, by Prof. W. S. Moore, Chief of the U.S. Weather Bureau. (Reprinted from *Science*.)

beyond the embryonic state, I feel that the realms of investigation are boundless, and that the opportunities are correspondingly great.

As the Chief of the greatest meteorological system in the world, and with the power to control, under the direction of the Secretary of Agriculture, not only its executive functions, but the lines of future scientific investigation, I fully realise the great responsibility that rests upon me, and that at the bar of public and scientific opinion I shall, in the years to come, justly be held to a strict accountability for my stewardship.

Before considering the lines of investigation which can consistently be prosecuted by the Weather Bureau, it will be well to note the law which prescribes the duties of the Chief.

By an Act Congress approved October 1, 1890, Sec. 3, Statutes at large, Fifty-first Congress, p. 653, it is provided:

"That the Chief of the Weather Bureau, under the direction of the Secretary of Agriculture, on and after July 1, 1891, shall have charge of the forecasting of weather, the issue of storm warnings, the display of weather and flood signals for the benefit of agriculture, commerce and navigation, the gauging and reporting of rivers, the maintenance and operation of sea-coast telegraph lines, and the collection and transmission of marine intelligence for the benefit of commerce and navigation, the reporting of temperature and rainfall conditions for the cotton interests, the display of frost and cold wave signals, the distribution of meteorological information in the interests of agriculture and commerce, and the taking of such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties."

It will be seen that the main object for the existence and continuation of this Bureau is to give warning of the approach of storms, and therefore that the proper line of investigation should be for the purpose of determining the true philosophy of storms. The goal to be striven for is the improvement of weather forecasts, and surely one of the pre-requisites to determine coming events is a thorough knowledge of existing conditions.

To those who have read every important treatise on meteorology, and who have studied every text-book on the subject, it is painfully patent that we are extremely ignorant of the mechanism of storms, of the operations of those vast and subtle forces in free air which give inception to the storm, and which supply the energy necessary to accelerate cyclonic action when formed, or to disperse the same when fully in operation. We know that great atmospheric swirls in the shape of high and low pressure areas alternately drift across the country at intervals of two or three days; that the atmosphere flows spirally into the cyclonic or low-pressure system and outward from the anti-cyclonic or high-pressure system, that the in-drawn east and south winds on the front of the storm are warm, and that the inwardly-flowing north and west winds are cold.

The theories of Redfield, Espy, Loomis, Ferrel, and others, teach that our great storms are composed of immense masses of air gyrating about a vertical or nearly vertical axis, drifting eastward, and at the same time drawing in warm easterly currents at the front, and cold westerly currents at the rear; that the commingling of these two as they rise to greater and greater elevations, near the regions of the cyclonic centre, throws down volumes of rain or snow; that as precipitation occurs with the ascending currents, the heat of condensation energises the cyclonic circulation; that the air at the centre of the storm is relatively warm, is rarefied by centrifugal force, and by reason of less density, rises to a great elevation, and in the upper regions of the atmosphere flows away laterally to assist in building up high-pressure areas on either side.

The high and low pressure areas are supposed to be carried eastward by the general easterly drift of the atmosphere in the middle latitudes, somewhat as eddies are carried along by water in a running stream.

But, unfortunately for the complete accuracy of these theories, the forecaster often finds heavy downpours of rain without any cyclonic circulation, and no convectional system in operation; again over immense areas of country, especially in the Rocky Mountain region, for many months in the year condensation occurs not at all in the warmer easterly currents flowing into the storm centre, but almost exclusively in the westerly portion of the storm area, where the cold north and west winds are flowing in.

Again, many investigators to-day have good reason to doubt