

EPHEMERIS FOR OBSERVATIONS OF EROS.—The following abridged ephemeris will serve for finding the planet during the month of December:—

		Ephemeris for 12h. Berlin Mean Time.			
1900.		R.A.		Decl.	
		h. m.	s.		
Dec.	1	1 27	19 27	+ 50	23 49 6
	3	26	42 70	49	43 44 9
	5	26	33 12	49	1 40 7
	7	26	50 26	48	17 51 2
	9	27	33 77	47	32 28 9
	11	28	43 14	46	45 46 0
	13	30	17 82	45	57 53 5
	15	32	17 24	45	9 2 7
	17	34	40 66	44	19 24 0
	19	37	27 28	43	29 7 2
	21	40	36 30	42	38 20 6
	23	44	6 85	41	47 12 2
	25	47	57 92	40	55 49 0
	27	52	8 49	40	4 17 1
	29	1 56	37 43	39	12 40 8
	31	2 1	23 61	+ 38	21 3 0

DISTRIBUTION OF MINOR PLANETS.—M. Freycinet has a further article in the *Comptes rendus* (vol. cxxxi. pp. 815-821), in which he discusses the distribution of the zone of asteroids more critically than in his previous paper in *Comptes rendus*, cxxx. pp. 1145-1154. On the assumption that these small bodies are the product of disruption of a former ring of matter revolving round the central body, he calculated the mean eccentricities of the several rings into which it might be expected to divide. On examination of the elements of 428 of the planets, it has been possible to divide them into eight groups, the members of each group having similar eccentricity and inclination of orbit. The numbers of separate bodies in each zone vary greatly—from 1 to 170. The mean thickness of the rings is 0.278, the radius of the earth's orbit being taken as unit, the individual rings varying from 0.22 to 0.36. In each ring the mean eccentricity of the members situated in the inner or inferior half is greater than that of the members occupying the superior or outer half; and comparing two rings, it is found that the mean eccentricity of the planets in the inferior part of the outer ring is greater than that of those occupying the superior part of the inner ring. In one ring—the fifth—consisting of 69 planets, the mean eccentricities of the two halves are identical, and it will be interesting to examine the places occupied by asteroids discovered in the future as to their effect on the constants of this region of the swarm.

THE NOVEMBER METEORS.—In the *Comptes rendus* (vol. cxxxi. pp. 821-825) Dr. Janssen describes the special preparations made for observing, from balloons, the meteors expected during the past month. A few Leonids were seen, but no indication of any special fall. In the description of the ascents, mention is made of the observers having to pass through several cloud belts, suggesting that in future an altitude of some 6000 metres should be attained to ensure more certainty of a clear sky.

M. Deslandres also gives, in the same issue (pp. 826-7), the results of the observations made at the Meudon Observatory. They were both visual and photographic, the latter being made with six cameras having apertures from 6 to 2 inches. All were carried by a single equatorial mounting so as to be under the control of one observer.

On the night of November 14, from 9h. 30m. to 1h., traces of 16 meteors were secured, of which 6 were Leonids, 5 Andromedes and 2 sporadic. On the night of the 15th, after 9h. 30m. 5 traces were obtained, 3 of which were Leonids.

HUXLEY'S LIFE AND WORK.¹

II.

ANOTHER remarkable side of Huxley's mind was his interest in and study of metaphysics. When the Metaphysical Society was started in 1869, there was some doubt among the promoters whether Huxley and Tyndall should be invited to join or not. Mr. Knowles was commissioned to come and consult me. I said at once that to draw the line at the opinions which they

¹ The first "Huxley Memorial Lecture" of the Anthropological Institute, delivered on November 13, by the Rt. Hon. Lord Avebury, F.R.S., D.C.L., LL.D. Continued from p. 96.

were known to hold would, as it seemed to me, limit the field of discussion, and there would always be doubts as to when the forbidden region began; that I had understood there was to be perfect freedom, and that though Huxley's and Tyndall's views might be objectionable to others of our members, I would answer for it that there could be nothing in the form of expression of which any just complaint could be made.

The society consisted of about forty members, and when we consider that they included Thompson, Archbishop of York, Ellicott, Bishop of Gloucester and Bristol, Dean Stanley and Dean Alford as representatives of the Church of England; Cardinal Manning, Father Dalgairns and W. G. Ward as Roman Catholics; among statesmen, Gladstone, the late Duke of Argyll, Lord Sherbrooke, Sir M. Grant Duff, John Morley, as well as Martineau, Tennyson, Browning, R. H. Hutton, W. Bagehot, Frederic Harrison, Leslie Stephen, Sir J. Stephen, Dr. Carpenter, Sir W. Gull, W. R. Greg, James Hinton, Shadworth Hodgson, Lord Arthur Russell, Sir Andrew Clark, Sir Alexander Grant, Mark Patteson, and W. K. Clifford, it will not be wondered that I looked forward to the meetings with the greatest interest. I experienced also one of the greatest surprises of my life. We all, I suppose, wondered who would be the first President. No doubt what happened was that Roman Catholics objected to Anglicans, Anglicans to Roman Catholics, both to Nonconformists; and the different schools of metaphysics also presented difficulties, so that finally, to my amazement, I found myself the first President! The discussions were perfectly free, but perfectly friendly; and I quite agree with Mr. H. Sidgwick, that Huxley was one of the foremost, keenest and most interesting debaters, which, in such a company, is indeed no slight praise.

We dined together, then a paper was read, which had generally been circulated beforehand, and then it was freely discussed, the author responding at the close. Huxley contributed several papers, but his main contribution to the interest of the Society was his extraordinary ability and clearness in debate.

His metaphysical studies led to his work on Hume and his memoirs on the writings of Descartes.

One of his most interesting treatises is a criticism of Descartes' theory of animal automatism. Descartes was not only a great philosopher, but also a great naturalist, and we owe to him the definite allocation of all the phenomena of consciousness to the brain. This was a great step in science, but, just because Descartes' views have been so completely incorporated with everyday thought, few of us realise how recently it was supposed that the passions were seated in the apparatuses of organic life. Even now we speak of the heart rather than the brain in describing character.

Descartes, as is known, was much puzzled as to the function of one part of the brain—a small, pear-shaped body about the size of a nut, and deeply seated. Known as the pineal gland, he suggested that it was the seat of the soul; but it is now regarded, and apparently on solid grounds, as the remains of the optic lobe of a central eye once possessed by our far-away ancestors, and still found in some animals, as, for instance, in certain lizards. Descartes was much impressed by the movements which are independent of consciousness or volition, and known as reflex actions—such, for instance, as the winking of the eye or the movement of the leg if the sole of the foot is touched. This takes place equally if, by any injury to the spinal marrow, the sensation in the legs has been destroyed.

Such movements appear to be more frequent among lower animals, and Descartes supposed that all their movements might be thus accounted for—that they were, like the movements of sensitive plants, absolutely detached from consciousness or sensation, and that, in fact, animals were mere machines or automata, devoid not only of reason, but of any kind of consciousness.

It must be admitted that Descartes' arguments are not easy to disprove, and no doubt certain cases of disease or injury—as, for instance, that of the soldier described by Dr. Mesnet, who, as the result of a wound in the head, fell from time to time into a condition of unconsciousness, during which, however, he ate, drank, smoked, dressed and undressed, and even wrote—have supplied additional evidence in support of his views. Huxley, while fully admitting this, came, and I think rightly, to the conclusion that the consciousness of which we feel certain in ourselves must have been evolved very gradually, and must therefore exist, though probably in a less degree, in other animals.

No one, indeed, I think, who has kept and studied pets, even if they be only ants and bees, can bring himself to regard them as mere machines.

The foundation of the Metaphysical Society led to the invention of the term "Agnostic."

"When I reached intellectual maturity," Huxley tells us, "and began to ask myself whether I was an atheist, a theist or a pantheist, a materialist or an idealist, a Christian or a freethinker, I found that the more I learned and reflected, the less ready was the answer; until, at last, I came to the conclusion that I had neither art nor part with any of these denominations except the last. The one thing in which most of these good people were agreed was the one thing in which I differed from them. They were quite sure they had attained a certain "gnosis"—had, more or less successfully, solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction that the problem was insoluble . . ."

These considerations pressed forcibly on him when he joined the Metaphysical Society.

"Every variety," he says, "of philosophical and theological opinion was represented there, and expressed itself with entire openness; most of my colleagues were "ists" of one sort or another; and, however kind and friendly they might be, I, the man without a rag of a habit to cover himself with, could not fail to have some of the uneasy feelings which must have beset the historical fox when, after leaving the trap, in which his tail remained, he presented himself to his normally elongated companions. So I took thought, and invented what I conceived to be the appropriate title of agnostic. It came into my head as suggestively antithetic to the gnostic of Church history, who professed to know so much about the very things of which I was ignorant; and I took the earliest opportunity of parading it at our Society, to show that I, too, had a tail like the other foxes."

Huxley denied that he was disposed to rank himself either as a fatalist, a materialist, or an atheist. "Not among fatalists, for I take the conception of necessity to have a logical, and not a physical, foundation; not among materialists, for I am utterly incapable of conceiving the existence of matter if there is no mind in which to picture that existence; not among atheists, for the problem of the ultimate cause of existence is one which seems to me to be hopelessly out of reach of my poor powers."

The late Duke of Argyll, in his interesting work on "The Philosophy of Belief," makes a very curious attack on Huxley's consistency. He observes that scientific writers use "forms of expression as well as individual words, all of which are literally charged with teleological meaning. Men even who would rather avoid such language if they could, but who are intent on giving the most complete and expressive description they can of the natural facts before them, find it wholly impossible to discharge this duty by any other means. Let us take as an example the work of describing organic structures in the science of biology. The standard treatise of Huxley on the 'Elements of Comparative Anatomy,' affords a remarkable example of this necessity, and of its results. . . ."

"How unreasonable it is to set aside, or to explain away, the full meaning of such words as 'apparatus' and 'plans,' comes out strongly when we analyse the preconceived assumptions which are supposed to be incompatible with the admission of it. . . ."

"To continue the use of words because we are conscious that we cannot do without them, and then to regret or neglect any of their implications, is the highest crime we can commit against the only faculties which enable us to grasp the realities of the world." Is not this, however, to fall into the error of some Greek philosophers, and to regard language, not only as a means of communication, but as an instrument of research. We all speak of sunrise and sunset, but it is no proof that the sun goes round the earth. The Duke himself says elsewhere:—

"We speak of time as if it were an active agent in doing this, that and the other. Yet we are quite conscious, when we choose to think of it, that when we speak of time in this sense, we are really thinking and speaking, not of time itself, but of the various physical forces which operate slowly and continuously in, or during, time. Apart from these forces, time does nothing."

This is, it seems to me, a complete reply to his own attack on Huxley's supposed inconsistency.

Theologians often seem to speak as if it were possible to believe something which one cannot understand, as if the belief were a matter of will, that there was some merit in believing what you cannot prove, and that if a statement of fact is put before you, you must

either believe or disbelieve it. Huxley, on the other hand, like most men of science, demanded clear proof, or what seemed to him clear proof, before he accepted any conclusion; he would, I believe, have admitted that you might accept a statement which you could not explain, but would have maintained that it was impossible to believe what you did not understand; that in such a case the word "belief" was an unfortunate misnomer; that it was wrong, and not right, to profess to believe anything for which you knew that there was no sufficient evidence, and that if it is proved you cannot help believing it; that as regards many matters the true position was not one either of belief or of disbelief, but of suspense.

In science we know that though the edifice of fact is enormous, the fundamental problems are still beyond our grasp, and we must be content to suspend our judgment, to adopt, in fact, the Scotch verdict of "not proven," so unfortunately ignored in our law as in our theology.

Faith is a matter more of deeds, not of words, as St. Paul shows in the Epistle to the Hebrews. If you do not act on what you profess to believe, you do not really and in truth believe it. May I give an instance? The Fijians really believed in a future life, according to their creed, you rose in the next world exactly as you died here—young if you were young, old if you were old, strong if you were strong, deaf if you were deaf, and so on. Consequently it was important to die in the full possession of one's faculties, before the muscles had begun to lose their strength, the eye to grow dim, or the ear to wax hard of hearing. On this they acted. Every one had himself killed in the prime of life; and Captain Wilkes mentions that in one large town there was not a single person over forty years of age.

That I call faith. That is a real belief in a future life.

Huxley's views are indicated in the three touching lines by Mrs. Huxley, which are inscribed on his tombstone:—

Be not afraid, ye wailing hearts that weep,
For still He giveth His beloved sleep,
And if an endless sleep He wills—so best.

That may be called unbelief, or a suspension of judgment. Huxley doubted.

But disbelief is that of those who, no matter what they say, act as if there was no future life, as if this world was everything, and in the words of Baxter in "The Saints' Everlasting Rest," profess to believe in Heaven, and yet act as if it was to be "tolerated indeed rather than the flames of Hell, but not to be desired before the felicity of Earth."

Huxley was, indeed, by no means without definite beliefs. "I am," he said, "no optimist, but I have the firmest belief that the Divine Government (if we may use such a phrase to express the sum of the customs of matter) is wholly just. The more I know intimately of the lives of other men (to say nothing of my own), the more obvious it is to me that the wicked does not flourish nor is the righteous punished."

One of the great problems of the future is to clear away the cobwebs which the early and mediæval ecclesiastics, unavoidably ignorant of science, and with ideas of the world now known to be fundamentally erroneous, have spun round the teachings of Christ; and in this Huxley rendered good service. For instance, all over the world in early days lunatics were supposed to be possessed by evil spirits. That was the universal belief of the Jews, as of other nations, 2000 years ago, and one of Huxley's most remarkable controversies was with Mr. Gladstone and Dr. Wace with reference to the "man possessed with devils," which, we are told, were cast out and permitted to enter into a herd of swine. Some people thought that these three distinguished men might have occupied their time better than, as was said at the time, "in fighting over the Gaderene swine." But as Huxley observed:—

"The real issue is whether the men of the nineteenth century are to adopt the demonology of the men of the first century as divinely-revealed truth, or to reject it as degrading falsity."

And as the first duty of religion is to form the highest conception possible to the human mind of the Divine Nature, Huxley naturally considered that when a Prime Minister and a Doctor of Divinity propound views showing so much ignorance of medical science, and so low a view of the Deity, it was time that a protest was made in the name, not only of science, but of religion.

Theologians themselves, indeed, admit the mystery of existence. "The wonderful world," says Canon Liddon, "in which we now pass this stage of our existence, whether the higher world

of faith be open to our gaze or not, is a very temple of many and august mysteries. . . . Everywhere around you are evidences of the existence and movement of a mysterious power which you can neither see, nor touch, nor define, nor measure, nor understand."

One of Huxley's difficulties he has stated in the following words: "Infinite benevolence need not have invented pain and sorrow at all—infinite malevolence would very easily have deprived us of the large measure of content and happiness that falls to our lot."

This does not, I confess, strike one as conclusive. It seems an answer if not perhaps quite complete, that if we are to have any freedom and responsibility, the possibility of evil follows necessarily. If two courses are open to us, there are two alternatives: either the results are the same in either case, and then it does not matter what we do; or the one course must be wise and the other unwise. Huxley, indeed, said in another place:—"I protest that if some great power could agree to make me always think what is true, and do what is right, on condition of being turned into a sort of clock and wound up every morning before I got out of bed, I should instantly close with the offer. The only freedom I care about is the freedom to do right; the freedom to do wrong I am ready to part with on the cheapest terms to any one who will take it of me. But when the Materialists stray beyond the borders of their path, and talk about there being nothing else in the world but Matter and Forces and necessary laws, . . . I decline to follow them."

Huxley was no enemy to the existence of an Established Church.

"I could conceive," he said, "the existence of an Established Church which should be a blessing to the community. A church in which, week by week, services should be devoted, not to the iteration of abstract propositions in theology, but to the setting before men's minds of an ideal of true, just and pure living; a place in which those who are weary of the burden of daily cares should find a moment's rest in the contemplation of the higher life which is possible for all, though attained by so few; a place in which the man of strife and of business should have time to think how small, after all, are the rewards he covets compared with peace and charity. Depend upon it, if such a Church existed, no one would seek to disestablish it."

It seems to me that he has here very nearly described the Church of Stanley, of Jowett, and of Kingsley.

Sir W. Flower justly observed that while "if the term 'religious' be limited to acceptance of the formularies of one of the current creeds of the world, it cannot be applied to Huxley; but no one could be intimate with him without feeling that he possessed a deep reverence for 'whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report,' and an abhorrence of all that is the reverse of these; and that, although he found difficulty in expressing it in definite words, he had a pervading sense of adoration of the infinite, very much akin to the highest religion."

Lord Shaftesbury records that "Prof. Huxley has this definition of morality and religion:—"Teach a child what is wise, that is morality. Teach him what is wise and beautiful, that is religion!" Let no one henceforth despair of making things clear and of giving explanations!" ("Life and Works," iii. 282).

I doubt, indeed, whether the debt which Religion owes to Science has yet been adequately acknowledged.

The real conflict—for conflict there has been and is—is not between Science and Religion, but between Science and Superstition. A disbelief in the goodness of God led to all the horrors of the Inquisition. Throughout the Middle Ages and down almost to our own times, as Lecky has so powerfully shown, the dread of witchcraft hung like a black pall over Christianity. Even so great and good a man as Wesley believed in it. It is Science which has cleared away these dark clouds, and we can hardly fail to see that it is just in those countries where Science is most backward that Religion is less well understood, and in those where Science is most advanced that Religion is purest. The services which Science has rendered to Religion have not as yet, I think, received the recognition they deserve.

Many of us may think that Huxley carried his scepticism too far, that some conclusions which he doubted, if not indeed proved, yet stand on a securer basis than he supposed.

He approached the consideration of these awful problems,

however, in no scoffing spirit, but with an earnest desire to arrive at the truth, and I am glad to acknowledge that this has been generously recognised by his opponents.

From his own point of view, Huxley was no opponent of religion, however fundamentally he might differ from the majority of clergymen. In Science we differ, but we are all seeking for truth, and we do not dream that any one is an enemy to "science."

In Theology, however, unfortunately as we think, a different standard has been adopted. Theologians often, though no doubt there are many exceptions, regard a difference from themselves as an attack on religion, a suspension of judgment as an adverse verdict, and doubt as infidelity.

It is therefore only just to them to say that their obituary notices of Huxley were fair and even generous. When they treated him as a foe they did so, as a rule, in a spirit as honourable to them as it was to him.

The *Christian World*, in a very interesting obituary notice, truly observed that "if in Huxley's earlier years the average opinion of the churches had been as ready as it is now to accept the evolution of the Bible, it would not have been so startled by Darwin's theory of the evolution of man; and Darwin's greatest disciple would have enjoyed thirty years ago the respect and confidence and affection with which we came to regard him before we lost him."

"Surely it is a striking and suggestive fact that both the retiring and the incoming President of the Royal Society, by way of climax to their eulogies, dwelt on the religious side of Huxley's character. "If religion means strenuousness in doing right, and trying to do right, who," asked Lord Kelvin, "has earned the title of a religious man better than Huxley?" And similarly Sir J. Lister, in emphasising Huxley's intellectual honesty, "his perfect truthfulness, his whole-hearted benevolence," felt impelled to adopt Lord Kelvin's word and celebrate "the religion that consists in the strenuous endeavour to be and do what is right."

Huxley was not only a great man, but a good and a brave one. It required much courage to profess his opinions, and if he had consulted only his own interests he would not have done so, but we owe much to him for the inestimable freedom which we now enjoy.

When he was moved to wrath it was when he thought wrong was being done, the people were being misled, or truth was being unfairly attacked, as, for instance, in the celebrated discussion at Oxford. The statue in the Natural History Museum is very powerful and a very exact likeness, but it is like him when he was moved to righteous indignation. It is not Huxley as he was generally, as he was when he was teaching, or when in the company of friends. He was one of the most warm-hearted and genial of men. Mr. Hutton, who sat with him on the Vivisection Commission, has recorded that "considering he represented the physiologists on this Commission, I was much struck with his evident horror of anything like torture even for scientific ends." I do not, however, see why this should have surprised him, because the position of physiologists is that it is the anti-vivisectionists who would enormously increase the suffering in the world. To speak of inflicting pain "for scientific ends" is misleading. It is not for the mere acquisition of useless knowledge, but for the diminution of suffering and because one experiment may prevent thousands of mistakes and save hundreds of lives. The medical profession may be mistaken in this, but it is obvious that their conviction, whether it be right or whether it be wrong, is not only compatible with, but is inspired by, a horror of unnecessary suffering.

The great object of his labours was, in his own words, "to promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life." His family life was thoroughly happy. He was devoted to his children, and they to him. "The love our children show us," he said in one of his letters, "warms our old age better than the sun."

Nor can I conclude without saying a word about Mrs. Huxley, of whom her son justly says that she was "his help and stay for forty years, in his struggles ready to counsel, in adversity to comfort; the critic whose judgment he valued above almost any, and whose praise he cared most to win; his first care and his latest thought, the other self, whose union with him was a supreme example of mutual sincerity and devotion."

At a time of deep depression and when his prospects looked most gloomy he mentions a letter from Miss Heathorn as

having given him "more comfort than anything for a long while. I wish to Heaven," he says, "it had reached me six months ago. It would have saved me a world of pain and error."

Huxley had two great objects in life as he has himself told us. "There are," he said, "two things I really care about—one is the progress of scientific thought, and the other is the bettering of the condition of the masses of the people by bettering them in the way of lifting themselves out of the misery which has hitherto been the lot of the majority of them. Posthumous fame is not particularly attractive to me, but, if I am to be remembered at all, I would rather it should be as 'a man who did his best to help the people' than by any other title."

It is not only because we, many of us, loved him as a friend, not only because we all of us recognise him as a great naturalist, but also because he was a great example to us all, a man who did his best to benefit the people, that we are here to do honour to his memory to-day.

THE ORIGIN AND PROGRESS OF SCIENTIFIC SOCIETIES.¹

ON the present occasion I propose to say a few words on a subject of little practical importance, so far as the needs of every-day life are concerned, but still not without some general interest, and not without a direct bearing on the history of the advancement of human knowledge—the "Origin, Development and Aims of our Scientific Societies." The subject is a large one, and it will be impossible to enter into details with regard to its almost innumerable ramifications. In justification of a considerable degree of limitation, I may incidentally mention that the "Official Year-book of the Scientific and Learned Societies of Great Britain and Ireland," for the year 1900, extends over upwards of 290 octavo pages.

In England no learned society received a Royal Charter before 1662, when the Royal Society was incorporated by Charles II. It had, however, been instituted in 1660. So early, moreover, as 1645 the lovers of experimental philosophy formed a society which met weekly in London on a certain day to treat and discourse of philosophical affairs, and many of its members became subsequently the first Fellows of the Royal Society. About the year 1648-1649, this little band of students was divided into two—one part remaining in London and the other migrating to Oxford, where a Philosophical Society of Oxford was established that subsequently for some time worked in concert with the Royal Society, and did not finally cease to exist until 1690.

About the year 1572, "divers gentlemen of London, studious in antiquities, formed themselves into a College or Society of Antiquaries." The honour of this foundation is "entirely due to that munificent patron of letters and learned men, Archbishop Parker. The members met near 20 years at the house of Sir Robert Cotton, and, in 1589, resolved to apply to the Queen for a charter of incorporation, and for some public building, where they might assemble and have a library." A petition was prepared for presentation to Her Majesty Queen Elizabeth praying for the incorporation of "An Academy for the Studye of Antiquity and History," the meetings of which were to be held in the Savoy, or the dissolved Priory of St. John of Jerusalem, or elsewhere. It is uncertain whether this petition was ever presented, but the Queen seems to have given the society her countenance, and under the presidency of Archbishops Parker and Whitgift successively it flourished, and a list of thirty-eight of its members, comprising such well-known names as Camden, Cotton, Erdeswicke, Lambarde, and Stow, is still extant. For some cause or other Elizabeth's successor, James I., thought fit to dissolve the society in 1604, and though attempts were made to revive it in 1617, and though there was an Antiquaries' feast on July 2, 1659, the society remained in a dormant condition until 1707. It then held weekly meetings at the "Bear Tavern" in the Strand, and afterwards at the "Young Devil Tavern" in Fleet Street, subsequently moving to the "Fountain Tavern." In 1718 the society was reconstituted, and in 1751 a Charter of Incorporation was granted to it by George III., who declared himself the founder and patron of the Society of Antiquaries of London.

Having traced the inception of the two oldest of our learned

¹ Abridgment of an address delivered at the opening meeting of the Society of Arts, November 21, by Sir John Evans, K.C.B., F.R.S.

societies, which in their early stages partook more of the nature of clubs than of what are now known as societies, I propose, before considering their further developments, to say something as to the proper aims and objects of a learned society, and the means usually adopted for carrying them into effect. Such a society is an association of persons united together by common tastes and anxious to improve or extend some particular branch of knowledge, or even the whole range of scientific inquiry. With this object in view it becomes necessary to hold periodical meetings for the discussion of subjects in which the society is interested, and for taking such action in respect of them as may seem desirable. The holding of such meetings involves an organisation and the appointment of presidents to take the chair at meetings, of secretaries to summon them, and of a treasurer to receive those subscriptions without which an association of the kind cannot exist. Moreover, for the determination of questions of policy and finance, especially when the society issued publications, a council of some kind becomes a necessity. It is on this organisation that the success or failure of a society mainly depends, and the questions as to the length of period that presidents and others should remain in office, what proportion of new blood should be infused into the council each year, and how far those in power are carrying out the views of the bulk of the members of the society, have frequently been discussed with more or less warmth. In some instances the too conservative apathy of the council has led to disruption and the foundation of new societies, or to the society under their charge being reduced to a state of inanimate slumber, while on the other hand too rapid revolutionary measures have led to diminutions in numbers, if not to absolute rebellion. Much, of course, of the welfare of a society depends upon the character of its publications being kept at a high level, and on their being brought out with scrupulous regularity.

There is one condition in the life of a scientific society which is entirely beyond its control or that of its council, and this condition may be superinduced by the activity of the society itself. As researches proceed and knowledge extends, new branches of inquiry are opened, which can only be investigated by those who apply themselves specially to the subject. New publications are required, particular days have to be set apart for the discussion of the new subject, and eventually it is found desirable to establish a separate branch of the old society, or to constitute a new one. The latter course is the one that has been most often adopted, especially in the case of biological science; and not infrequently the new society finds a home in the apartments of the parent society, and under its fostering care.

Let us now go back to the period when Charles II. granted his second Charter to the Royal Society of London for improving natural knowledge. The Society of Antiquaries was in abeyance, so that the Royal Society was practically the only institution of the kind in Britain, and its aims were naturally wide. On November 20, 1663, the society consisted of 131 Fellows, of whom 18 were noblemen, 22 baronets and knights, 47 esquires, 32 doctors, 2 bachelors of divinity, 2 masters of arts, and 8 strangers or foreign members. With the exception of the large proportion of physicians or doctors, it will be observed that the society in the main was composed of noblemen and gentlemen of independent position, and that the professional element was to a very great extent wanting. Great attention was paid to experimental methods; but "what the learned and inquisitive are doing, or have done in physick, mechanics, opticks, astronomy, medicine, chymistry, anatomy, both abroad and at home" were subjects on which they were solicitous. Many of the branches of science diligently pursued at the present day were either unknown or in their infancy. The variation of the compass had been observed, but magnetism and electricity presented almost untroudden fields; the steam engine was in an embryonic stage; visions of space with four or more dimensions had not visited the poetical mathematical brain; microscopes and telescopes were in their infancy; the family of the planets was no more numerous than of old; the circulation of the blood had not met with universal acceptance, and the existence of *bacilli* was but dimly conceived; chemistry was of the crudest, and the elements were earth, air, fire and water; anatomy had already made notable advances, but Dermatological, Laryngological, and Odontological societies were not even dreamt of; geology was unborn, and palaeontology did not exist, except in connection with Noah's Deluge.

One of the results of this very wide scope of the Royal Society was, that at its meeting the variety of subjects brought forward