Address on the Occasion of the Centenary Celebration of the Chemical Society.

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The observance of anniversaries and centenaries is dictated by a deep-seated instinct. How far this in its turn is inspired by a feeling for the magic of numbers and awe at the vast cyclical processes of Nature, I do not know, but, however that may be, these recurrent occasions for retrospect and prospect are assuredly felt to be significant and moving.

The character of the thoughts and emotions which they arouse will in some measure depend upon the attitude towards history adopted by the participants. To some, history is as a play that is ended: to others, as a chart on which they hope to read the future from the past. But to everyone, I suppose, the centenary of a scientific society must bring a message of some kind.

There are few dramas as enthralling as the struggle for the secrets of reluctant Nature, and few fields in which the future beckons so insistently as in that of scientific thought.

We are celebrating the centenary, not of a discovery, not of a person, but of a Society, and this circumstance reminds us that thoughts and inventions are in a considerable measure the products of particular historical settings. For our purpose, therefore, we cannot reflect upon the history of chemistry in the past century in England, or speculate upon its probable future, except in relation to the people who made it and are making it, and to the general conditions of their lives.

Not only does the pious memory of our Founders, benefactors, and predecessors (both the recognised and the unrecognised great men) bid us consider the human as well as the purely intellectual story, but it is doubtful whether any other approach would be more than an abstraction with the limited validity which abstractions have.

You see what deep philosophical questions are raised by the major theme: the relation of the scientific and the humane; the nature of history and the possibility of extrapolation and prediction; piety towards the past, expectations from and duties toward the future. I feel called upon to remind you of these themes, even though I cannot possibly do justice to them.

The Chemical Society was founded in the year 1841. The England in which it came into being stood on the threshold of one of its greatest eras of expansion, but no one at the time could know of this, and to many the prospect must have appeared sombre and even fuller of uncertainties than that which confronts us today. The dislocations caused by the Industrial Revolution were all too obvious, but the fruits of progress were still to be gathered. The lot of the impoverished manual workers was wretched in the extreme, the scandals of child labour in coal mines, potteries, and other industries were coming to light, but the Factory Acts were not yet passed, the agitation and distress connected with the Corn Laws coloured the political scene, and the demand of workers for a better mode of life expressed itself in the Chartist movement and broke forth into riots which to many people suggested that society was on the verge of revolution and disruption.

Queen Victoria was on the throne, but the splendours of her era were yet to be, and the great movements of her time would only have been discernible to those of unusual penetration. The worst social conditions depicted in the writings of Dickens still prevailed.

There was nothing in the obvious character of the time to announce a period of intellectual flowering, and yet it was just then that many learned societies, including our own, came into being. Scientific studies in England were hardly in any clear way the product of their age, and sprang more from the learned curiosity of amateurs than from the conscious needs of society. There were practically no laboratories for chemical research, and little or no University instruction in chemistry.

The chemical stage was set as follows. In 1841, the time which had elapsed since the "chemical revolution" of Lavoisier was almost exactly equal to that from the discovery of radioactivity to the present day. Chemistry as a science was then as old as is now the new nuclear alchemy upon which we believe the future so largely to depend. It is difficult today for a scientifically educated person to realise how profound was the change of thought which followed the publication of the Lavoisier treatise. It represented a complete philosophical re-orientation of ideas on the nature of substance. Two Englishmen in very different ways had played parts of the first magnitude. Priestley, whose house was wrecked by a mob, had made the discovery which opened the way for Lavoisier, and Dalton, living in an obscurity which astonished his foreign visitors, had formulated the theory upon which all future development was to depend.

Between the time of Dalton and the foundation of the Chemical Society the great forward sweep of organic chemistry had begun, but in this the English school had played little part, as was explicable in a country which tended to produce a few of the finest flowers of science, art, and literature without any very vigorous general growth of leaf and root. At the moment of our foundation Dalton was still alive, but Liebig, who visited England at about this time, found little in the world of chemistry to inspire him. Yet Faraday was at the height of his powers and his great work on the laws of electrolytic action was already accomplished. Its full implications were far from obvious to his contemporaries, and indeed the confusions which Avogadro's paper of 1811 might have cleared away still clouded chemistry. On the Continent the great battle between the rival interpretations of the structure of organic compounds was at its height.

At about this time much was being done in England to lay the foundations of physical chemistry, not only by Faraday with his work on the liquefaction of gases and on electrochemistry, but also by the original and versatile Thomas Graham, first President of the Chemical Society.

Such was the chemical scene at the time of our foundation.

Let us now, after the manner of the dramatist, raise the curtain at successive intervals of a generation and see what transformations have been brought about.

1861, twenty years after the foundation, was, as it happens, the year of Prince Albert's death and of the outbreak of the American Civil War. The early dislocations caused by the Industrial Revolution were now largely righted, the conditions of labour had improved, steamships and railways were in rapid development, the era of prosperity symbolised by the Great Exhibition of 1851 was well launched, and the great intellectual movements of the Victorian age were under way. Herbert Spencer's advocacy of scientific education sought to justify in theory what the foundation of the College of Chemistry in 1847, Owens College, Manchester, in 1851, and the Oxford laboratories in 1861 were gradually implementing in practice. "The Origin of Species" had appeared in 1859, and the materialist trend of thought was evident. Chemistry had seen two decades of steady progress but had been on the whole unshaken by revolutionary changes. Cannizzaro's paper of 1858 had removed one of the major obscurities, and Frankland and Kekule had placed structural chemistry on a firm foundation. In this country Hofmann, Mansfield, Williamson, and Frankland are seen among the outstanding figures of the period. Chemistry in England was still mainly the affair of the amateur. Indeed, in 1867 the only technical education in Leeds with its quarter of a million inhabitants was provided by one teacher who worked in a cellar and held a class in chemistry, receiving a grant of £11 a year for the purpose. Nevertheless the *Journal of the Chemical Society* from its early years had attracted contributions from the eminent chemists of the Continent, and the names of Liebig and Bunsen are in evidence.

Another twenty years pass and many momentous changes have occurred. The historical background shows political democracy in England in full stride with widened franchise and a sweeping increase in general literacy: it shows the decline of agriculture in its most disastrous phase, and the British primacy in the manufacturing export trade just about to decline from its height. The early signs of major world troubles are already discernible: the rank weeds of bureaucracy are breaking through the soil, and since 1870 the world has learnt from Prussia that war on the national scale has possibilities hitherto unexploited. The curse of conscription already lies on Europe. Disraeli has died, and Karl Marx lives in London. In some respects the Victorian age has passed its zenith, and some of the brightest stars have set: Dickens, Mill, and Clark Maxwell are gone, and Darwin's work is over. Although there have been important events such as the founding of the Cavendish laboratory in 1871, the position of scientific studies in the Universities is still feeble, and even now the great discoveries and inventions continue to come from men who are self-taught and have received little formal training.

Some of the great trends of chemistry are reflected in our *Journal*. One of the most splendid phenomena had been the flowering of the great tree of organic chemistry. To this science the contribution of England was honourable but limited. At the time in question the great name of Perkin appears currently, first the father, then the son. The science of physical chemistry is well launched, and perhaps the papers of Harcourt and Esson on the "Course of Chemical Change" are among the most characteristic of the contributions from this country. We must note the immense clarification which chemistry had by now received from the Periodic Law, observing with satisfaction that Newlands had done so much to initiate this by a paper read to the Chemical Society in 1866, but with regret that this paper was never published.

The *Journal* of the year 1881 is interesting. Boron hydride is described, while experiments on the synthesis of ammonia and discussions of absorption spectra show the approach of modern times. But one publication above all shines like a beacon. This is the great Faraday lecture of Helmholtz, where for the first time the full implications of Faraday's laws are revealed and the way is opened for the whole modern electronic theory.

As an example of the delay which may attend the exploitation of valuable discoveries a passage in the Presidential Address of Roscoe in this year speaks for itself. "The researches of Captain Abney have been continued with conspicuous succcess, and have given birth to a discovery of the highest interest and of the greatest possible promise. This is no less than a distinct physical test of the existence in organic compounds of the organic radicals, and a means of recognising the chemical structure of an organic compound by means of the spectroscope. This result, which naturally opens out an entirely new field for investigation, and effects for the organic metals that which ordinary high temperature spectrum analysis does for the inorganic metals, is accomplished by photographing the absorption spectra of organic compounds in the infra-red part of the spectrum. In these invisible portions, characteristic and distinct absorption lines and bands occur for each organic radical. . . . This investigation is still in its infancy, but one of greater importance to chemists has seldom, if ever, been communicated to the Society."

The next scene presents a mottled picture of sun and shade. In 1901 the death of Queen Victoria symbolised the end of an epoch. It was a time of intellectual and social unrest and uncertainty : agriculture had collapsed, industrial struggles had acquired a new bitterness, the tide of the new popular journalism was rising in a strong flood, and the administrative machinery of the country was elaborated beyond what had ever been known. Some trade prosperity and the residues of a romantic imperialism imparted their diverse glamours, and a brilliant Court was about to lend an appearance of solidity to an age which the first German War was destined to bring to a catastrophic end.

By this time the health of chemistry in Britain was much more robust, and schools of research were gradually coming into being in many of the Universities. Tilden in 1904 told the Chemical Society that he considered the science to be flourishing. A glance at the *Journal* of 1901 certainly shows a great variety of activities, which range over investigations on alkaloids, bacterial actions, optically active nitrogen compounds, absorption spectra, and the synthesis of methane. A paper by Lapworth marks the beginning of that detailed interpretation of the inner mechanism of reactions which has been one of the great British contributions to organic chemistry in the present century. It is indeed appropriate that the Faraday lecture to be given during the present celebrations is devoted to the exposition of this powerful theme.

Radioactivity had been discovered in 1896 by Becquerel, and in 1902 the first of Rutherford's great contributions makes its appearance in the *Journal*. A measure of the excitement of the times is conveyed by the words at the end of the second contribution of Rutherford and Soddy :

> "Nothing can yet be stated of the mechanism of the changes involved, but whatever view is ultimately adopted it seems not unreasonable to hope that radioactivity affords the means of obtaining information of processes occurring within the chemical atom."

The transformation by 1921 was colossal indeed in every aspect of life : profound political changes, an unprecedented degree of mechanism, and all the febrile aftermath of what then counted as the greatest war in history. People were more conscious than ever before of international and economic problems. The scene shifts from a national stage to a world stage.

The war of 1914—1918 had brought profound changes to British chemistry. It has often been called the chemist's war. Unprecedented needs of explosives, chemical warfare agents, and other products of industry had forced an improvised expansion, which, by a fortunate dispensation of providence, gradually merged into an orderly and continued evolution. In the following decade there is a history, which may be followed with a degree of sober satisfaction, of the creation of a new chemical industry, of the expansion of University research, of the founding of research institutes, and, not least, of the establishment of the most excellent relations between industrial and academic chemistry. These are one of the happiest auguries for our uncertain future.

Taking a glance at some of the subjects represented in the *Journal* of 1921, we find, in the first place, papers belonging to the aftermath of the chemist's war : on explosives and mustard gas, and on the sorption of gases : we are reminded of a major revolution in science by Aston's lecture on mass spectra. On the physical side, colloidal electrolytes, heterogeneous catalysis, and photochemistry are coming into prominence, and Brönsted's paper on salt effects typifies not only the transition from the older to the newer theories of solution, but also the abiding international character of our chemical literature. On the organic side, Perkin's papers on the alkaloids, harmine and harmaline, belong to the culmination of one great tradition in organic chemistry, while a newer tradition, that of studying function as well as structure and of bringing physical ideas into intimate relation with the study of organic substances, is illustrated by papers on the influence of substituents on the character of benzene compounds and by a series of Ingold's early papers on questions of reactivity. Vernon's work on tellurium derivatives reminds us of the contributions which this country has made to stereochemical problems, especially through the researches of Mills, past President of the Chemical Society.

If we pursue our theatrical fancy to the end and raise the curtain for a last time on the actual centenary date of 1941, it discloses a scene of chaos and destruction. Two decades of fruitful progress seem to have been brought to a tragic end. In some ways the two decades had been among the most productive that chemistry had known. The constitution of natural products had been brilliantly revealed, and in this connexion the names of two Presidents of the Society—Haworth and Robinson—are outstanding. Modern theories of valency had brought an immense clarification into the whole system of inorganic chemistry : the subtleties of organic behaviour had been penetrated, and the intimate mechanism of chemical changes in general stood largely revealed. There had been a powerful cross-fertilisation of chemistry with physics and mathematics. And on the human side the developments were no less vigorous : vastly increased support of research in the Universities, a flood tide of advance in the chemical industry, and, not least, the growth of co-operation between the centres of pure science on the one hand and the great industries on the other, which was of incalculable significance.

As I have remarked, the way in which all this is assessed depends upon a philosophical attitude. One view of history sees the course of human affairs as a chaotic sequence of accidents, the results of unpredictable and indeed often unknowable contingencies : the other sees an orderly and inevitable flow of events in well-marked channels. In that great work " War and Peace " Tolstoy defends and illustrates the second thesis, discounting the influence of great men, and maintaining passionately that the fate of nations evolves naturally out of their essential nature.

All men of science are familiar with those controversies in which the arguments on both sides seem unanswerable : and they know that in the end the contending parties are realised to have seen not truth and falsehood but two aspects of a larger whole. A scientific analogy helps to resolve the conflict about the nature of history.

The evolution of material systems is governed both by those thermodynamic factors which determine equilibria and define the extent and direction of possible changes, and, differently but equally powerfully, by the kinetic factors which determine when and where the changes are initiated and with what speed they progress. The former depend upon average conditions such as temperature and pressure, the latter upon chance fluctuations of energy, highly localised and intense departures from the average. Without these exceptional events the system remains inert. But on the other hand, no fluctuation, however violent, causes its evolution in a direction different from that required by the thermodynamic state. So it may well be in affairs : the exceptional event, the rise of the great man of thought or action, determines time and location, but, for the exceptional to take effect, the average must be in a condition to respond.

In the survey of the century, therefore, one may try to discern the essential trends, to which great events and personalities are related more as occasions than as causes.

As far as chemistry is concerned the history of at any rate the first half of the century has been very much the affair of the individual. The great names—Davy, Faraday, Dalton, Graham, Newlands, Frankland, Perkin—do not seem to bear any special relation to their environment, and might seem to support the purely sporadic view of history. And yet certain general currents are discernible in the contribution from this country. Perhaps one of the deepest and strongest has been the evolution based upon an intuitive sense of the electrical nature of matter. By much more than a play of fancy a genealogy can be traced, through Davy who found the key to the phenomena of polar combination, Faraday, Crookes whose instinct guided him to the study of " radiant matter ", Townsend and J. J. Thomson who infuse new blood from physics, to the modern schools of Lapworth, Robinson, and Ingold, who have carried the electrical conception into the subtlest regions of organic chemistry. Nor should I omit in this connexion to mention the scholarly studies of Sidgwick, another past President of the Society, which have done so much to clarify the vast field of inorganic chemistry. This line will almost certainly continue, but how, or where, is as indeterminate as the position of a single electron in an atom.

A collateral line is formed by those who, speculating on the nature of matter, were vouchsafed a glimpse of a promised land into which they did not enter fully—Prout, Newlands, Crookes.

The final conquest of that land came only when the armies of physics and of chemistry joined forces in the victorious advance of Rutherford and Soddy, Rayleigh and Ramsay, J. J. Thomson, Aston and Moseley.

In contrast with the imaginative quality of these men, another of our strongest traditions has been that of empirical observation, unguided by much in the way of theory. This has expressed and illustrated both a national strength and a national weakness. From the days of Priestley onwards, it has led to factual discoveries of the first importance, and produced experimenters second to none in such men as Dewar, Dixon, and Bone, but it has not created schools, and its positive achievements have occasionally been lessened by a mistrust of theory so healthy as almost to discourage understanding. But the impact of the two opposing schools has been unquestionably fruitful, and has sometimes added to the gaiety of nations.

Other recurrent themes can be traced throughout the century : on the one hand a sense of the mystery and wonder of chemical change, and on the other a joy in precise measurement for its own sake—two contrasted but equally important motives in the development of physical chemistry, which reflect the blend of the romantic and the practical in the make-up of so many Englishmen. Affinities could be traced throughout the period, as between the work of Graham and that of Berkeley and Hartley, or between the spirit of Harcourt and Esson and that of various modern schools. And yet, the purely personal character of much of the great work could equally well be illustrated by innumerable examples, such as Perkin's famous discovery of mauve, Dewar's observations on specific heats at low temperatures, or Crookes's studies of the rare earths.

The truth is, I think, that the more easily distinguishable threads have been woven more by what is common in the intellectual make-up of the people, than by a direct and conscious tradition. There are men who, placed in almost any circumstances, will mould them to something great, and it is such men predominantly whom we have to commemorate, at any rate in all but the last two decades of the century. The breeding of such men is not likely to change in any rapid way, but the nature of the society into which they are born is changing before our eyes.

One of the unmistakable trends of the past century has been the successive decline of different aspects of individualism : the independent craftsman, the aristocratic politician, the empire-building explorer all departed from the scene. In science a similar trend has been visible though at a lag of several decades. At the time of our foundation the stage is dominated by the amateur, whether a Cavendish or a Faraday : later the individual is more and more frequently dependent upon the University or technical college, small and independent but none the less a community. Then the great research associations appear and the State subsidy becomes indispensable. Two great wars intensified and accelerated the collective process in the world of science until today we are faced with the problems presented by vast industrial research laboratories and by state enterprises undertaking work which is inconceivable without the co-ordinated efforts of hundreds of men of science. The great question is : what is to be the fate of the individual in the world which has emerged ?

In this matter something of an ideological battle has been engaged, and since the question is one of moment for the future of an independent scientific society, I propose to say a little about it, in as objective a manner as possible.

May I, for this purpose, introduce an analogy between human affairs and certain scientific laws ? The particles composing matter are endowed with individual motions which would lead to complete chaos but for attractive forces constraining them at times into orderly configurations. The two conflicting tendencies are, of course, what men of science know as the entropy factor and the energy factor. It is the balance between the two which governs all the rich complexity of chemistry and physics, and determines that measure of effective action called free energy. Were there maximum entropy and complete chaos the world of phenomena would be much the poorer, but were there the rigid constraint which the energy factor alone would impose things would be as bad or worse. Nobody who has thought about science can fail to admire the art with which Nature interweaves her two great themes. When molecular chaos is set in order it is only at a price, but price and value are astutely bargained. So it must be in human affairs.

Complete individualism means chaos, which is only given form by something analogous to an energy factor—by State compulsion, or by powerful emotional forces. If any of these controls are applied too vigorously the result is order indeed but the order of utter stagnation. Just as Nature strikes her subtle balance, so it must be here. Nothing is less fruitful than doctrinaire argument about freedom and planning. The vast achievements of military regimentation in wartime have been cited as examples for peace, but in this it is forgotten that results in limited spheres have had to be bought with an utter disregard of cost, whether of money, happiness, or life.

The problem is not to propound facile doctrines, but by hard and detailed thinking in every possible sphere to find those mechanisms and those techniques which in combination lead to the greatest measure of effective action.

A hundred years ago we saw an individualist society faced with the task of controlling the industrial revolution : at the beginning of a new century we face a task which seems even greater, that of preventing an organised society from turning individuals into slaves. The problem involves the relation of the State to science, of the industries to the Universities, the organisation of research laboratories, and indeed the relation of every man of science to the laboratory in which he works and to the science as a whole.

Those who call themselves planners are often, I think, not conscious enough of the art and effort involved in large-scale action. Even with the most admirable motives and goals, operative complexity often brings frustration. There is need for a complete new science, a kind of biological and psychological statistical mechanics to clarify these matters. The beginnings of it exist. Indeed we have seen one gigantic manifestation of directed human activity in the evil arts of the late rulers of Germany, whose ingenious mechanisms were applied in opposition to truth and justice but might have been used to better ends.

This thesis will be accepted readily enough by the exponents of what are now called social studies, but we may be told that the organisation of affairs must be placed in the hands of specially trained humanists, and that the scientific man should be confined to the rôle of an advisory expert. Such a tradition has of course tended to grow up in some of the public services. But one can say with conviction that its persistence will be unfortunate and its extension disastrous. It is like a separation of the heart from the brain and of the mind from the body. The man of science must himself handle the human problems, and, in scientific affairs, nobody but the man of science can do it. On the whole the Universities and the great chemical industries are aware of this, and the excellent relations which have been growing up between them will exert a powerful influence for good, and are of happy augury. But eternal vigilance is the price of these things. At every level in every organisation where men are engaged in scientific pursuits those in charge must continue to wrestle with the problems of combining liberty with order to the end of finding that course which is humanly as well as technically the most effective.

One very welcome sign of the past few years has been the increasing number of scientific papers published from the chemical industry. These are clear and welcome evidence that the leaders of that industry are showing understanding of the intellectual needs of the men who serve it. One can only hope that the whips of commercial secrecy will not be succeeded by the scorpions of military security.

Looking to the future of chemical research, one can confidently foresee an era of great technical progress. The powerful organisations which will ensure this are already in operation. The relevant problems of pure science will also be explored on a scale which has hitherto been undreamt of. Such matters as thermodynamic and kinetic studies on polymers, biological studies on chemotherapeutic agents, and scores of others could be cited to show how the approach is changing from the sporadic and the amateur to the thorough and the professional. All this leads to new knowledge of inestimable value, and in this field also progress seems assured.

But of that most important kind of new knowledge, that which does not seem to relate to any existing field, it is harder to speak on the basis of anything but faith. And yet in this knowledge lies the true seed of the future. It will come only from the least conforming of minds, and the discoveries of the greatest ultimate moment are the least likely to have been favoured by official encouragement or support. They must be like the flowers of the poet

> " daffodils,
> That come before the swallow dares, and take
> The winds of March with beauty."

We may well ask whether the winds of future Marches may not be more intolerant than those of the past.

There is no royal road to be followed into the future. In the scientific and social history of the past century the picture has been one of light and shade, ebb and flow, and enormous uncertainties crowned by miraculous progress. On this scene men of all kinds have laboured for the science of chemistry. Today we honour them. There is no reason to suppose that their qualities have not been inherited. The stage is changed and the parts are different, but the actors are very much the same.

It is still the individual who really counts, but his problems are different. Faraday's genius overcame lack of education and lack of facilities. These are handicaps from which he would be very unlikely to suffer today. The Faraday of tomorrow will have by his own methods to break through the trammels of an over-organised society : and for this it may well be that he will need something more of the quality of a Nelson.

Nothing has ever yet contained the great river of knowledge. Though Archimedes was slain, Galileo persecuted, and Lavoisier condemned, it has flowed over or around every obstacle which stupidity, indifference, or malevolence have created.

In the old eastern story a debate arises as to what is the strongest thing in the world, and in the end this is recognised to be the truth. " As for the truth it endureth and is always strong : it liveth and conquereth for evermore. . . . Great is truth and mighty above all things." Whatever clouds may seem to lower over the new century, this is the great light which shines on it.

But this faith does not obviate the necessity for continuous detailed effort. If it is based upon an extrapolation from the past, that past is one in which people were ready to struggle and endure. It is incumbent on us to consider what stands before our Society and what policies that Society should pursue.

There is one which stands in the centre of and indeed includes all other policies, and that is to maintain the prestige of chemistry as a pure science. It is right that the Chemical Society should occupy a central position in the world of chemistry. I have referred to the increasing complexity of this world, with its multiplicity of organisations. But by common consent new knowledge is the life blood of it all, and the heart should be the Chemical Society itself. Of the relations between the great chemical industry and the Universities I have already spoken, and gratitude must be expressed for the humane policy of so many leaders of that industry. But it remains for the younger chemists in it to take an ever more active part in the publication and discussion of new knowledge. Provision for this is one of those problems where the scientific and the humane are inseparable.

Relations between chemistry and its neighbour sciences—physics, mathematics, and biology—are now so close that the frontiers are practically abolished and the joint discussion of common problems will be of increasing importance.

All this raises a practical question of the first magnitude, that of adequate facilities for meeting. I feel a little ashamed that on this great occasion we should receive our guests in alien halls, however hospitable they may be. I should like to hope that before long a statesmanlike solution to this problem will have been found.

Important as buildings may be, our publications are still more so, and in the eyes of posterity the Society of today will be judged more by the quality of the work which it publishes than by any other criterion. As Shakespeare tells us, the immortality conferred by black ink is greater than that of gates of steel or rocks impregnable. It has been a sad economy which has lavished money upon so many objects while neglecting the means of scientific publication. We must continue to struggle against this unhappy policy and hope that it will pass, never to return.

Among the traditions upon which we look back with pride is that of the international character of the Society. I am happy to say that as the result of a special Centenary Appeal for the purpose this valuable element in our activity will be strengthened, and that we now have the means of bringing foreign men of science to take part more often and more fully in our doings. There can be no question of the great benefit which chemists in this country will derive from the arrangement.

And now to the conclusion of the whole matter. What the Society is and must continue above all else to be is a fellowship of those who share the love of chemistry, that most splendid child of intellect and art. Chemistry provides not only a mental discipline, but an adventure and an æsthetic experience. Its followers seek to know the hidden causes which underlie the transformations of our changing world, to learn the essence of the rose's colour, the lilac's fragrance, and the oak's tenacity, and to understand the secret paths by which the sunlight and the air create these wonders.

And to this knowledge they attach an absolute value, that of truth and beauty. The vision of Nature yields the secret of power and wealth, and for this it may be sought by many. But it is revealed only to those who seek it for itself. Its pursuit has united the predecessors whom we commemorate : it will unite our successors for as long as the spirit of man endures.