

PRESIDENTIAL ADDRESS.

DELIVERED BEFORE THE CHEMICAL SOCIETY IN EDINBURGH ON MARCH 29TH, 1950.

The Chemical Society—A Mid-century Review.

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INTRODUCTORY.

IN selecting the title for this Presidential Address, although by no means creating a precedent, I am departing from a custom which has prevailed in recent years. In doing so I make no apology, for I feel that it is useful for the President from time to time to survey the affairs of the Society and of Chemistry in the course of his Address.

In the early years of the Society's history such Addresses were regularly delivered, and the tradition was last upheld by Sir Gilbert Morgan in 1934. Since then much has transpired. The country is slowly recovering from six years of war, which have left their mark on science as on every other phase of our national life.

So far as chemistry is concerned, its importance as a dominant factor in re-establishing the prosperity of the country is generally recognised. In many ways the growing appreciation of Chemistry's function in the modern State has added to the difficulties which face the Society. These difficulties are familiar enough to our senior Fellows, but those who have been more recently elected—and our Fellowship has doubled in ten years—may not be so well acquainted with them.

Although my remarks deal primarily with the domestic affairs of the Society, I shall also refer to our external relations both with other British chemical organisations and with the International Union of Pure and Applied Chemistry.

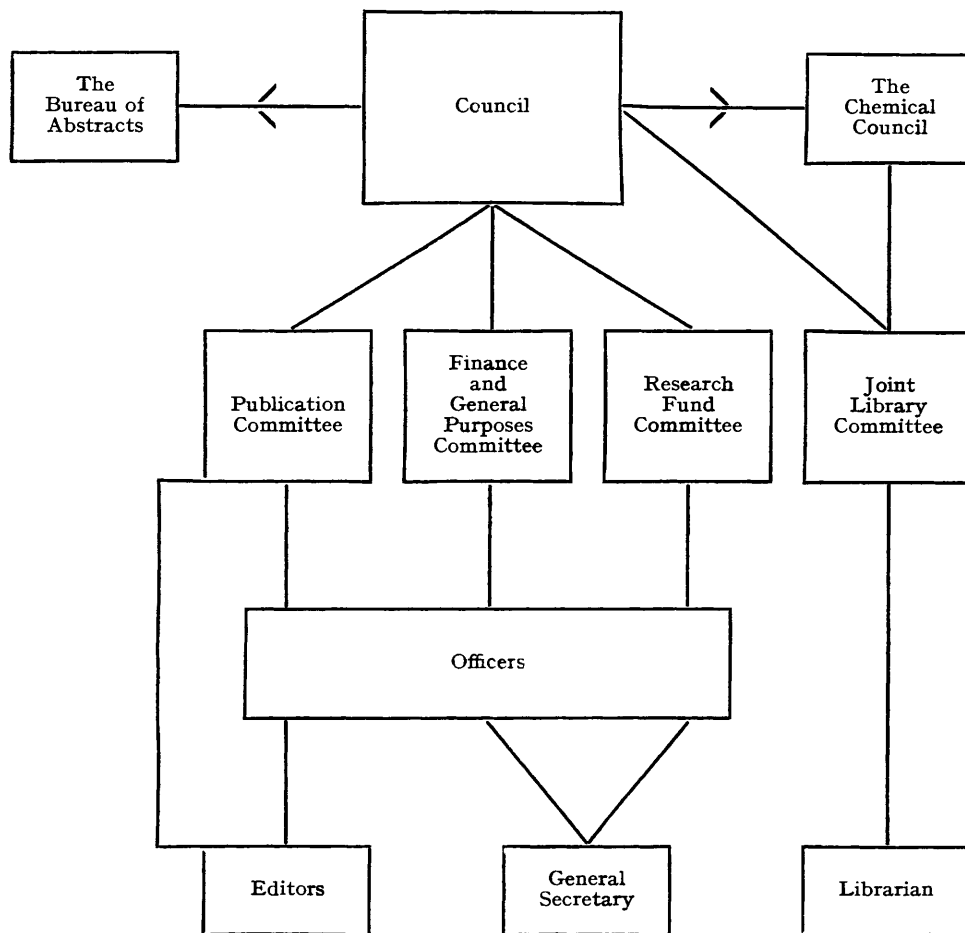
GOVERNMENT AND ORGANISATION OF THE SOCIETY.

The Society is governed by its Council, the Ordinary Members of which are elected by Fellows resident in the British Isles for a three-years period of office on a territorial representation basis. The general administration is supervised by the Officers (President, Treasurer, and Honorary Secretaries), who generally meet weekly throughout the working session and act as a Board of Directors responsible to Council through the Finance and General Purposes Committee, the Publication Committee, and the Research Fund Committee (Fig. 1). In all these activities the central part played by our General Secretary must not be overlooked, for it is upon his shoulders that much of the day to day responsibility devolves. We are indeed fortunate in having this important office filled by a person so capable and enthusiastic as Mr. Ruck Keene. The Council is also responsible for the capital expenditure on the Library, which is authorised on the recommendation of the Joint Library Committee. This latter is an organ of the Chemical Council and represents all the bodies whose members have been granted the right to make use of the Library.

In 1932 a long overdue extension of the Society's activities was brought about by the appointment of Local Representatives at seventeen centres throughout the country. At the present time there are 30 such Representatives covering the British Commonwealth, including Representatives from Ceylon, India, and Pakistan whom we have recently added.

Many Fellows will not realise how much they are indebted to those who have served the Society as Honorary Officers, as members of Council or of its Committees, or as Local Representatives, and in other ways. The growth of the Society and the high reputation of its publications are due in no small measure to the fact that throughout its history the Society has never lacked Fellows willing to place their time and experience freely at its disposal.

FIG. 1.
THE CHEMICAL SOCIETY



FELLOWSHIP.

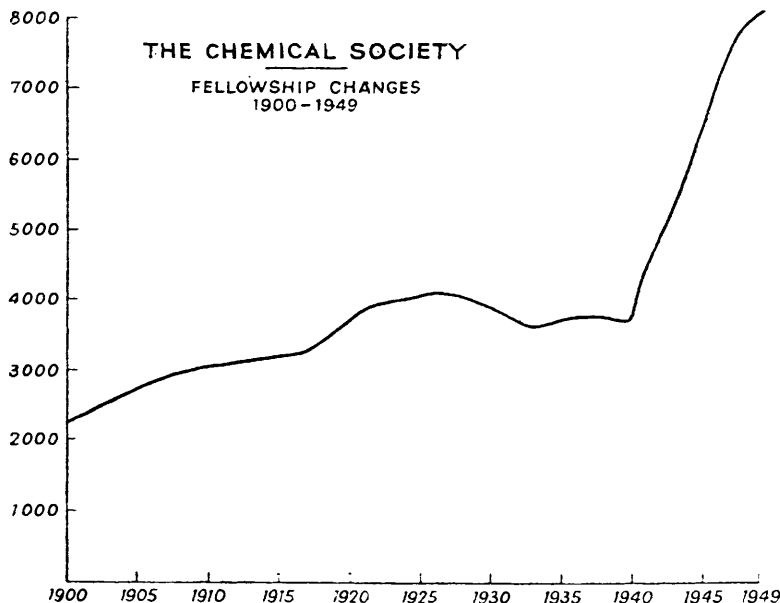
The membership of our Society—77 in 1841—had increased to 2292 by 1900. Its further expansion since that date provides an index of the growth of chemistry as a science. This is shown diagrammatically in Fig. 2, which also reveals, in its minor fluctuations, the political and economic vicissitudes of the past half-century. By 1910 the Fellowship had grown to over 3000, but with the First World War, when this country was forced to develop an organic chemical industry as a matter of urgent necessity, the rate of increase became more rapid, only to be slowed and then reversed by the years of depression between the wars. In the later " thirties " our numbers again showed modest increases and received only slight set-backs at the outbreak of war in 1939. From 1941 onwards, however, the membership curve has risen very steeply, passing the 8000 mark in 1949.

This is due, in part, to the joint subscription scheme, to which I will refer in detail later. Much of the increase of recent years, however, can be ascribed to the accelerated expansion of chemical activity attributable first to the needs of war and now to those of increased productivity.

Can we expect this increase to continue? On the one hand, we must remember the experiences of the 1920's, when the end of the post-war boom led to a decline in numbers. On the other

hand, the supply of trained chemists, who are in greater demand than ever before, has not yet reached its peak and, as is shown in a report recently issued by the Ministry of Labour and

FIG. 2.



National Service, the output of graduates with chemical training over the next five years will, in spite of the expansion in training facilities that has taken place, fall short of the demand by nearly 2000 chemists. The same report estimates that nearly 10,000 trained chemists will be required over the next five years to meet an expansion in the Chemical Industry, in the Scientific Civil Service, and in teaching appointments. We have, therefore, solid grounds for believing that the chemical community as a whole is in a reasonably strong position to meet any difficulties of readjustment that may arise during the next few years. Beyond that it would be rash to attempt to prophesy.

THE SOCIETY'S PUBLICATIONS.

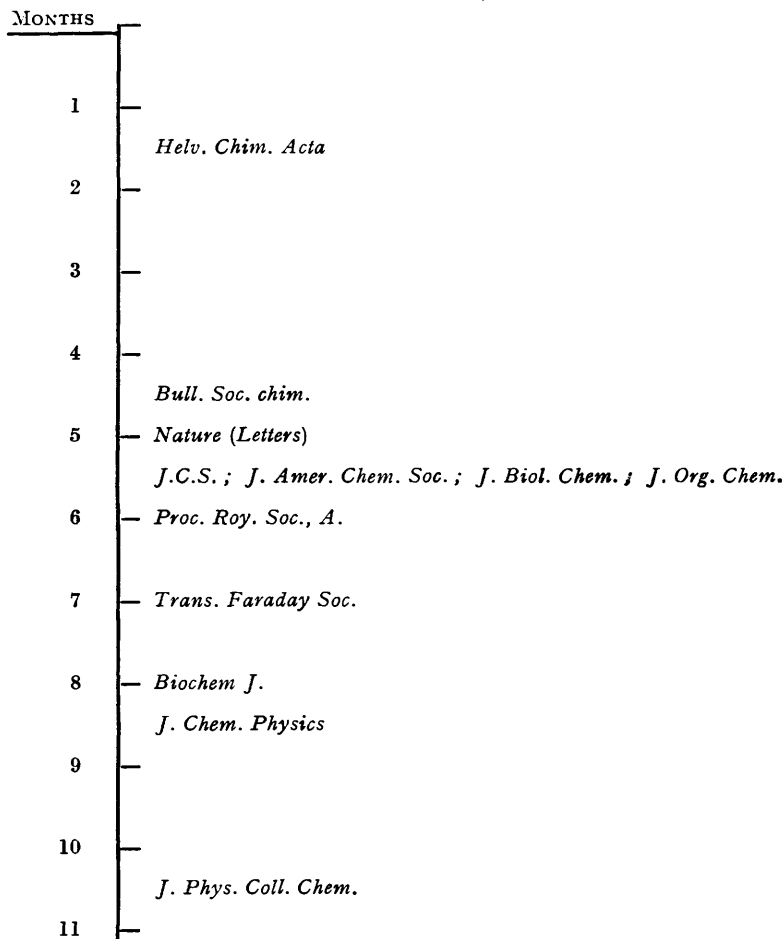
Turning now to the various activities of the Society, I would like to discuss first our publications, for these represent its most important function. In addressing the American Chemical Society on the occasion of the conferment upon him of the Priestley Medal, Dr. A. B. Lamb, Editor of its *Journal* from 1918 to 1949, stated: "New discoveries that remain undisclosed might almost as well not have been made. The prompt and widespread communication of new findings is essential, particularly to fellow scientists who can appreciate and use them. Publication is the life-blood of science." Judged by this standard, we have, I submit, every reason to be satisfied. The *Journal* for 1949 contained 870 papers and was the largest the Society has ever produced. The steady increase in the circulation of the *Journal*, coupled with the very favourable reception given to *Quarterly Reviews*, first introduced in 1947, indicate that the quality of our publications has been maintained at a high level.

A rapidity of publication almost approaching the pre-war rate has now been reached, no mean achievement when one bears in mind that only two years ago a paper submitted for publication would not appear in print for some twelve or thirteen months. It is unnecessary to elaborate how such a delay in publication must seriously hamper further development and application of any research. To-day, thanks to the vigorous policy of the Publication Committee and the unremitting energy of the Editorial Staff and Messrs. Richard Clay and Company, our Printers, the Society is publishing papers received, in most cases, only four months previously—a rate of publication which, as indicated in Fig. 3, compared, already in January, very favourably with that of other chemical journals.

The impact of chemistry on the economic life of the country is reflected in the increase in volume of the scientific communications published by the Society, which has risen by over 500% during the past half-century (Fig. 4). It will be observed that, with only minor fluctuations, a steady rise took place up to the period of the First World War, when, as again in 1939—1945, the curve of publication dipped steeply. Of particular interest are the statistics since 1943, when the publication curve had reached its wartime lowest point (Fig. 5). This diagram shows also the papers received and the manner in which the rate of publication in 1949 outstripped the rate at which communications were received.

FIG. 3.

MONTHS BETWEEN RECEIPT OF MANUSCRIPT AND DISTRIBUTION OF JOURNAL (AVERAGES—
JANUARY, 1950).



Although it is obviously difficult to attempt to forecast the size of the *Journal* in future years, the rate at which papers have been submitted during the past twelve months and are still being submitted suggests that it will be necessary as a permanent service to publish a much larger *Journal* than before the war. There are various factors which support this view: the more enlightened attitude towards publication adopted by industrial firms; the proliferation of Government-sponsored research organisations; and the opening of new centres for research in the Dominions and throughout the Commonwealth. Again, we must not overlook the expansion of post-graduate research in all University Departments of Chemistry. While papers coming

FIG. 4.

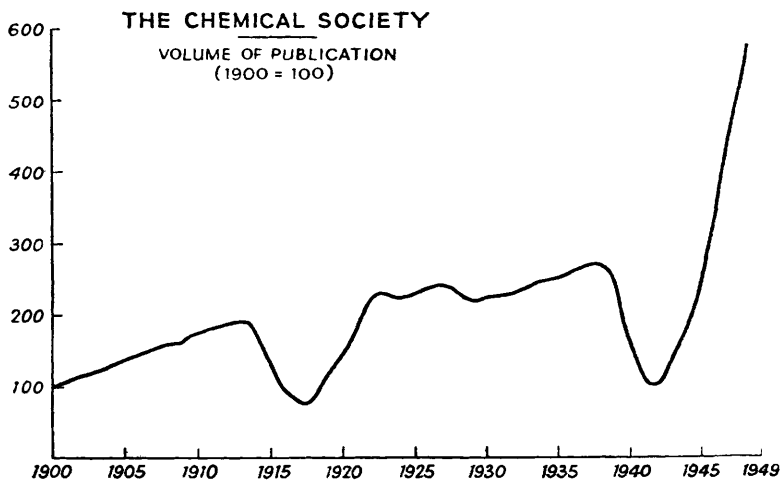
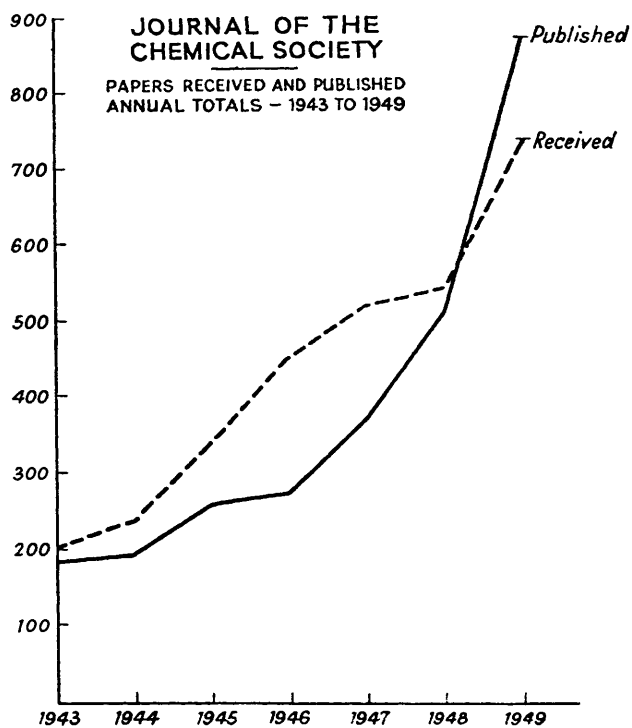


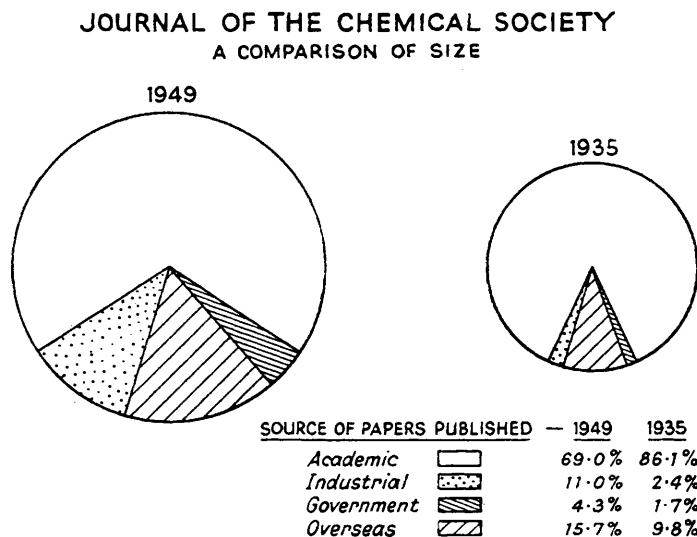
FIG. 5.



from academic sources still provide the major contribution to our *Journal*, the proportion from industry, from Government sources, and from overseas has more than doubled in the past fifteen years (Fig. 6).

Abstracts.—The Society issued a regular series of Abstracts in its *Journal* from 1871 until 1924, when this work was delegated to the newly formed Bureau of Chemical Abstracts—a joint body set up in co-operation with the Society of Chemical Industry, whose publication of Abstracts dates back to 1882. The Bureau of Chemical Abstracts was later known as “The Bureau of Chemical and Physiological Abstracts” and became, in 1945, “The Bureau of Abstracts.” Although the Bureau is a separate body incorporated under the Companies Act of 1929, it relies on the Chemical Society and the Society of Chemical Industry for by far the greater part of its financial resources, and these two Societies between them appoint approximately half the Board of Directors. Additional support for certain aspects of the work of the Bureau is now received from the Institution of Chemical Engineers, the Physiological Society, the Pathological Society, the Biochemical Society, the Anatomical Society of Great Britain and Ireland, the Society of Experimental Biology, and the Society of Public Analysts and other Analytical Chemists. The abstracting organisations with which *British Abstracts* may be

FIG. 6.



compared are *Chemical Abstracts*, published by the American Chemical Society, and the German *Chemisches Zentralblatt*.

In times of financial stringency the Abstracts have always been a ready target for economy measures. Thus, in November 1924, the Council considered a resolution in the name of Professor W. H. Perkin “That the Society discontinues publishing the Abstracts from 1st January 1926.” This was defeated after a ballot had been taken. In 1931, the period of the world slump, a joint committee of the Society and the Society of Chemical Industry explored, without reaching any successful conclusion, the possibility of bilingual Abstracts to be produced in co-operation with the *Chemisches Zentralblatt*. The question of the Abstracts is again before us. During 1949, as stated in the Proceedings, the Council was unfortunately forced, owing to lack of funds, to give absolute priority to the Society’s own publications. As a consequence, we have been unable to increase our grant to the Bureau, which must have more financial help if *British Abstracts* are adequately to fulfil their proper function of covering the chemical literature of the world.

The Officers and Council have given much anxious thought to this difficult question, to which an answer must be found without delay if our Abstracts are to continue. I believe that the ultimate solution is to be sought in the formation of an international abstracting organisation, and I hope that this pressing problem will figure prominently on the agenda at the XVIth Conference of the International Union of Pure and Applied Chemistry which meets next year in the United States. Our friends of the American Chemical Society are, I believe, also not

entirely free from financial anxieties regarding their publications, and I suggest that official talks should be initiated with them without delay in order to examine the possibilities of common action. It is therefore with mixed feelings that I read of the revival of the *Chemisches Zentralblatt*. Apart from financial considerations, the duplication of abstracts in various countries places an intolerable burden on scientific manpower, and cannot to-day be justified.

We claim that science is international. Let us then go ahead with determination and imagination to carve a way to successful co-operation.

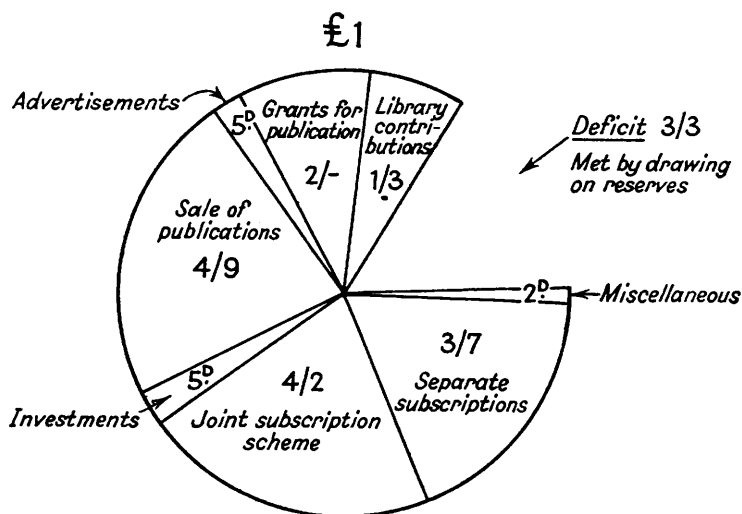
Annual Reports and Quarterly Reviews.—In 1904, during the Presidency of Sir William Tilden, the series of *Annual Reports on the Progress of Chemistry* were instituted to fill a need for special reports, in addition to abstracts, defining the state of knowledge on particular fields of research. With the growth of new branches of chemistry, each with its specialised language and techniques, it became impossible for one reporter to deal with a subject of such wide range as, say, General and Physical Chemistry, and the practice was started of inviting specialists to write short reviews on selected topics judged ripe for summarising. This measure, excellent in itself, was not sufficiently comprehensive to meet the demand for reviews on specialist subjects written in a manner which would render them capable of being understood by the non-specialist. In 1947 the Society, after a delay imposed by the outbreak of war, published the first volume of *Quarterly Reviews*, which have since developed into an important item in the Society's range of publications.

FINANCE.

In financial affairs, the situation, as you will have gathered, is far from satisfactory, especially when one considers the important services the Society renders to the State and Industry alike. The exceptional increase in the volume of publication has for the last two years

FIG. 7.

SOURCES OF INCOME AND DEFICIT RELATED TO EACH POUND OF EXPENDITURE



prevented the Society from balancing its accounts. Our total income—excluding special funds—was £48,244 in 1949, showing a deficit of income over expenditure of £9,111.

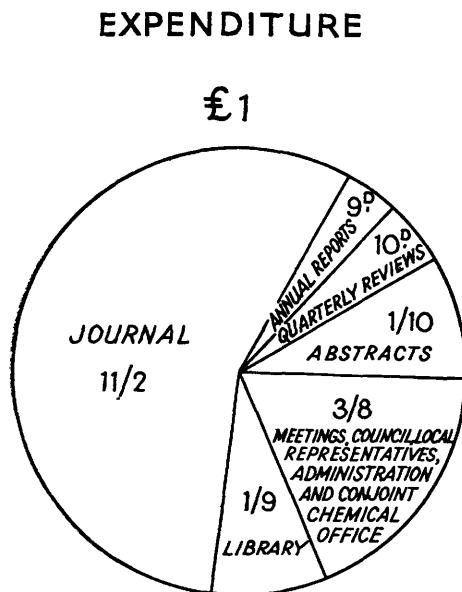
The source of every pound of our income is conveniently reproduced in a simple form of diagram sometimes known as the "Industrial Cake" (Fig. 7). Unfortunately, the Society's cake starts with a goodly slice missing, *i.e.*, the deficit which we have had to make good by drawing on our all too slender reserves. It will be seen that Fellows of the Society and

subscribers to our publications find nearly three-quarters of our total income and that grants from outside sources represent only one-tenth of the total.

The diagram of our expenditure (Fig. 8) reveals how high a proportion of our resources is devoted to publications. One of the problems which has always beset the Society is how to supply the younger chemists with the *Journal* at a moderate price. It is no more reasonable to expect them to pay the full cost of the *Journal*—an essential tool of their trade—than to expect a worker to pay for the expensive machine which he operates for the benefit of his country or of his firm. For this reason, the Council has taken steps to ensure that the recent increase in schedule prices should fall less heavily upon the younger chemists paying the reduced subscription.

In 1841 the annual subscription was fixed at £2 for town members and £1 for country members, a distinction which was later dropped. The basic subscription was increased to £3 in 1921 and to £3 : 10 : 0 in 1947, but this did not affect Fellows under 25 years of age, for whom the subscription was retained at £1 : 15 : 0. Few Societies, I should imagine, are able to show so small an increase in subscription over so long a period.

FIG. 8.



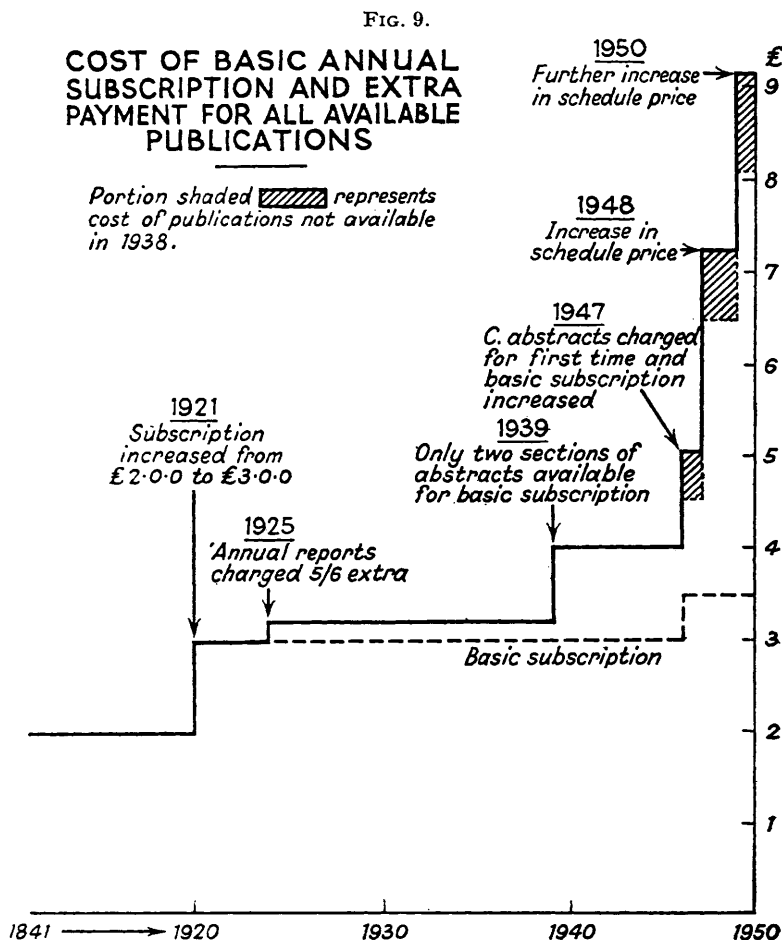
Naturally, if a Fellow wishes to receive every available publication, he will obviously pay much more than the basic £3 : 10 : 0 (see Fig. 9). Even in such a case, however, it cannot justly be claimed that the cost is really excessive, having regard to the increased bulk of all publications and to the general rise in commodity prices. Indeed, far from being overcharged for his publications, the chemist in this country receives them in some cases at considerably less than the cost of production.

Unfortunately, there are still those among us who are satisfied to enjoy the benefits and privileges of a profession without contributing anything to its upkeep. Even at the risk of being called "old-fashioned," I must record my belief that the younger chemist of to-day lacks the "esprit de corps" of an earlier generation. The present annual subscription represents a much smaller percentage of a young man's salary than did the sum which, fifty years ago, Fellows of the Society considered it an honour to pay. I have no time for the person who refrains from supporting the Society because he has access to all the journals in a library. No intellectual pursuit can be followed on the basis of a rigid time-table of study, and many will agree with me that they can gain much more from a leisurely perusal of journals in their own homes. But if ties of duty and sentiment are not so strong to-day, surely self-interest should dictate the necessity for young men in chemical appointments to play their part in the affairs of the Society in the advancement of their science. I would like to see every chemical firm make it an obligation that all qualified chemists employed by them should contribute through the Chemical Council

to the services provided for the benefit of chemists as a whole. If this were done, the status of chemists in the community would very soon be raised and most of the financial problems of the publishing bodies would rapidly disappear.

Before I deal with the part which the Society plays on the Chemical Council and, through the British National Committee for Chemistry, in international affairs, I should make mention of the more important of the special funds which the Society controls.

The Research Fund was formed in a small way as early as 1872 and was later considerably augmented by donations from Dr. G. D. Longstaff, the Worshipful Company of Goldsmiths, and others. The annual income of the Fund is now some £600—700, and grants for the purchase of



special apparatus and chemicals are awarded twice per annum. This Fund is greatly appreciated by workers in many academic institutions, especially those with slender resources.

The Centenary Fund, inaugurated during the celebrations in 1947, enables us to strengthen our age-long ties with our foreign colleagues. The Fund exists to defray the cost of inviting distinguished chemists from overseas to lecture in this country and to take part in our meetings. It also enables the Society to send official delegates to conferences and meetings in other countries.

THE CHEMICAL COUNCIL.

The increasingly heavy cost of publication had earlier in this century become a burden too great for the Society to meet from the subscriptions of its Fellows alone, and this was recognised in 1925 when, somewhat tardily, Industry contributed a sum of just over £2,000 to the Publications Fund, which had just been instituted largely through the energies of the Treasurer

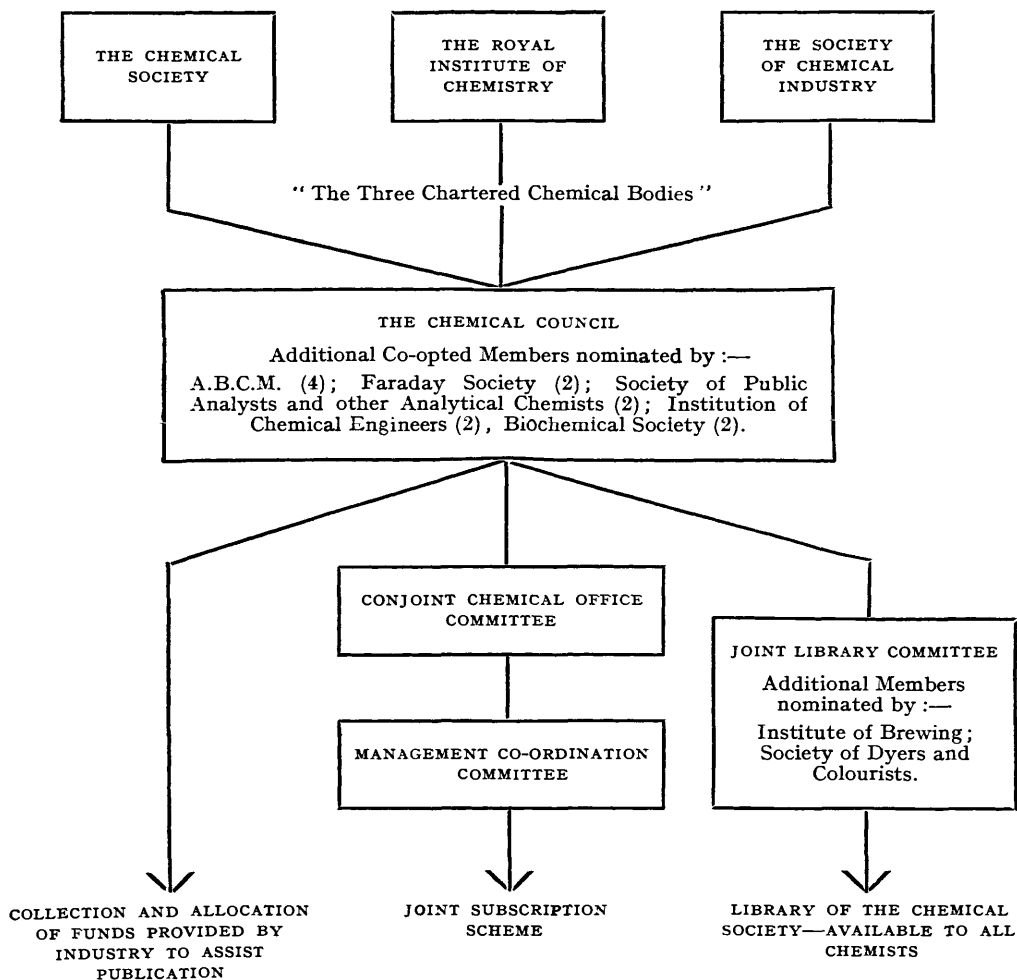
at that time, the late Sir Jocelyn Thorpe. In contributing to this Fund, and in making further donations to the cost of publications in subsequent years, Industry formally acknowledged the essential services which the Chemical Society and the Society of Chemical Industry provided.

The need to co-ordinate the assistance given by Industry led to the formation of the Chemical Council in 1935 by deed of agreement between the three chartered chemical bodies—The Chemical Society, The Society of Chemical Industry, and The Royal Institute of Chemistry. In the words of the agreement, the objects of the Council were

“co-ordination of scientific and educational publications, the publication of new discoveries in chemical science and of their application to the arts and manufactures, the promotion of research, the maintenance of a library for research and education purposes, and the provision and equipment of a building or buildings for all or any of the aforesaid purposes.”

The agreement also gave power to the newly formed Council to co-opt as additional members representatives of other kindred organisations. At present, the Chemical Council consists of

FIG. 10.

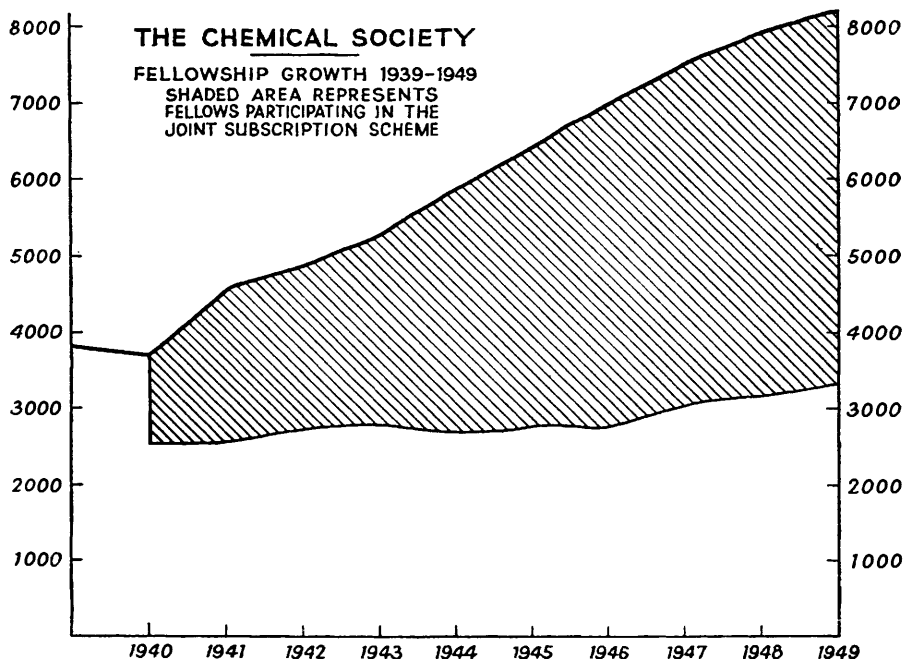


twenty-four members—four from each of the three chartered bodies and from the Association of British Chemical Manufacturers, and two each co-opted from the Faraday Society, the Society of Public Analysts and other Analytical Chemists, the Biochemical Society, and the Institution of Chemical Engineers (Fig. 10).

The agreement constituting the Chemical Council made special provision for the management of the Library of the Chemical Society to be in the hands of a Joint Library Committee responsible to the Council, and for the maintenance of the Library to be shared between the constituent bodies in proportion to their membership. The capital expenditure on journals, books, fixtures, and binding is, however, still borne entirely by the Chemical Society, which retains its ownership of the Library and its contents.

A further important activity of the Chemical Council has been the inauguration of the Joint Subscription Scheme, now administered by the Conjoint Chemical Office. The Scheme has been a considerable boon to its participants, since it has enabled those with very varied interests to select the services suited to their individual requirements from a wide range provided by more than one Society. The chemist is able to obtain these services, which may vary at different stages of his career, at much less cost than the separate subscriptions to the individual bodies. At the same time, he has the satisfaction of knowing that he is playing his part in maintaining the services required by the chemical community as a whole.

FIG. 11.



Benefit has also accrued to the respective Societies through the operation of the Scheme. Although many factors have contributed to the increase in membership over recent years, we must not overlook that a high proportion of the Fellows now pay a joint subscription, as shown in Fig. 11.

Since the formation of our Society in 1841 chemists have founded a number of societies and institutions to provide for their special interests. In part, this has arisen since it would be difficult for one body to cater for the needs of all the specialised branches of chemistry. Each of these bodies has developed a character of its own and has its own group of loyal supporters. At the same time, it must be admitted that chemistry suffers by comparison with some other professions which have a strong central organisation to control their scientific, professional, and technological interest. Can we not, I wonder, build on the Joint Subscription Scheme an organisation that will give us the benefits of centralised control, while retaining for the various Societies an autonomy in the conduct of their affairs?

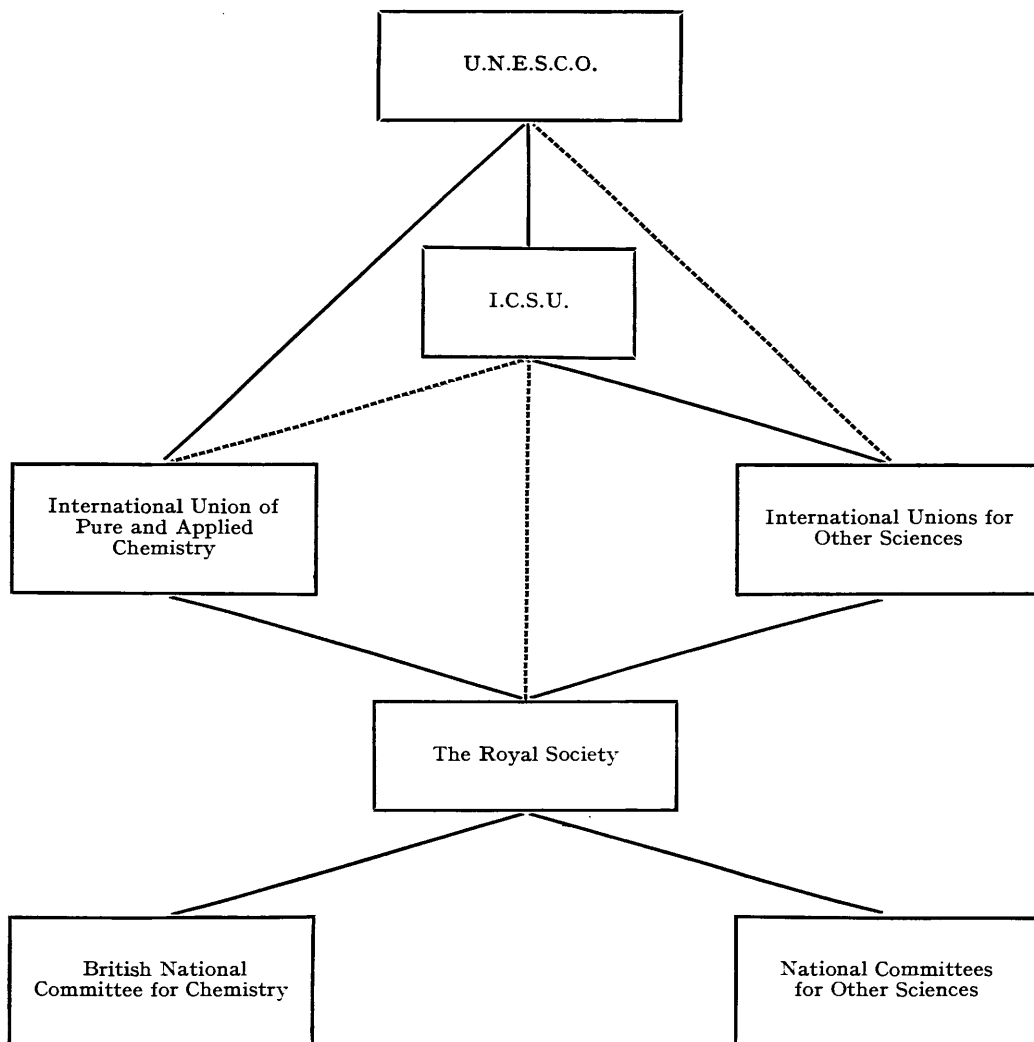
In the meantime, the Chemical Council has launched a new appeal to Industry to increase the support which it has given in the past and without which it is impossible for the publishing societies to render a full service to the welfare of the country. Although it is too early to measure the result of this appeal, we earnestly hope that it will enable our publications to

continue without restrictions, from which the Chemical Industry would be the first to suffer, to the ultimate detriment of our whole national economy.

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY.

I have already mentioned the International Union of Pure and Applied Chemistry. As there seems to be little general knowledge among the majority of chemists in this country concerning this body, I would like, before concluding my address, briefly to refer to its activities and its relationship with our Society (see Fig. 12).

FIG. 12.



Historically, I have to go back to 1918, when the Royal Society, the Académie des Sciences of Paris, and the National Academy of Sciences at Washington discussed informally a possible future organisation of scientific undertakings. A preliminary meeting was held in London in October, 1918, on the invitation of the Royal Society, at which eight of the Allied countries were represented. This was followed by an official meeting of delegates from the academies of the Allied countries and, in the case of Great Britain, the Royal Society, which met in Brussels in the summer of 1919 as the first General Assembly of the International Research Council. At this Assembly, International Unions for Astronomy, Geodesy and Geophysics, Chemistry, and

Mathematics were formed and their Statutes were approved, as well as those of the Research Council (I.C.S.U.). The Unions were left completely free to manage their own affairs in accordance with their Statutes, and from the outset the International Union of Pure and Applied Chemistry has been the most active and has worked most satisfactorily.

Thirty-one countries are now attached to the Union, which is governed by a Council consisting of delegates from all the adhering countries. The number of delegates each country can nominate depends on the category in which it is placed according to its importance in the field of chemistry. There are three categories. Countries comprising category A have the right to nominate six delegates, category B four delegates, and category C two delegates. In the case of Great Britain, which naturally comes within category A, delegates are appointed by the Royal Society working through its National Committee for Chemistry, upon which the Chemical Society is represented.

While the Council is the supreme controlling body of the Union, executive powers are vested in a General Purposes Committee known as the Bureau. This Committee consists of the President, six Vice-Presidents, six elected members, the Treasurer, and the General Secretary. A meeting of the Council and of the Bureau constitutes a Conference, which meets every two years in a selected country. The agenda of the Conference includes the Presidential Report, the Treasurer's Report, general administrative business, and the reports of the Commissions. These Commissions cover all the scientific and technical aspects of chemistry. Each Commission has its own chairman and secretary, and is composed of specialists in the specific field for which it has been set up. There are at present 20 Commissions, detailed information on the work of which will be found in the issues of *Chemistry and Industry* dated February 25th and March 4th and 11th, 1950.

Recently, I.C.S.U. has set up mixed Commissions, which are composed of delegates from more than one Union. An example of this is the Commission on Standards, Units and Constants of Radioactivity, which includes delegates from the International Unions of both Chemistry and Physics.

During the meeting of the XIVth Conference of the International Union of Chemistry in London in July, 1947, it was decided to set up a small Executive Committee selected from members of the Bureau. The Executive Committee meets every three months to carry out the routine business of the Union; at present its members are Professor H. R. Kruyt (President), Dr. L. H. Lampitt (Treasurer), Professor R. Delaby (Secretary General), Professor Sir Ian Heilbron, and Professor E. Berner.

Finally, I should explain in a word that apart from the International Union's own income, which is used to defray travelling expenses of delegates, publication of reports, etc., financial aid is provided by U.N.E.S.C.O. towards the cost of meetings of Commissions and Conferences.*

CONCLUSION.

Chemistry is playing an indispensable part in the complex economic life of to-day. Some of its achievements arouse widespread public interest, as, for example, the production of nylon, penicillin, or cortisone, but the steady flow of chemical discoveries in other fields is not always appreciated. New materials with special properties, new solvents, new drugs, and new dyestuffs are always being made available through chemical research for use in industry, and the service which the Chemical Society can render to the research worker, especially by the provision of a rapid and efficient medium for the publication of his results, was never greater than it is now.

Furthermore, international organisations are likely to play an increasingly important rôle in the future and, by establishing agreed standards and possibly by the co-ordination of abstracting services, will do much to make it easier for work performed in one country to be understood and applied elsewhere. The Society can, however, only fulfil its task in the national and the international sphere if it has the full support of its Fellows and, moreover, if all chemists regard membership of the Society as a primary duty.

One final word, which is to express my warm thanks to Mr. Ruck Keene for the unsparing help he has given me in the preparation of this address.

* For detailed information regarding the formation of the International Union of Pure and Applied Chemistry, see the late Sir Henry Lyons's book "The Royal Society 1660—1940;" also "International Organization of Chemists" by Marston Taylor Bogert, *Chem. Eng. News*, 1949, 27, 1992, and "The International Union of Pure and Applied Chemistry," by R. Delaby, *Endeavour*, 1950, 9, 18.