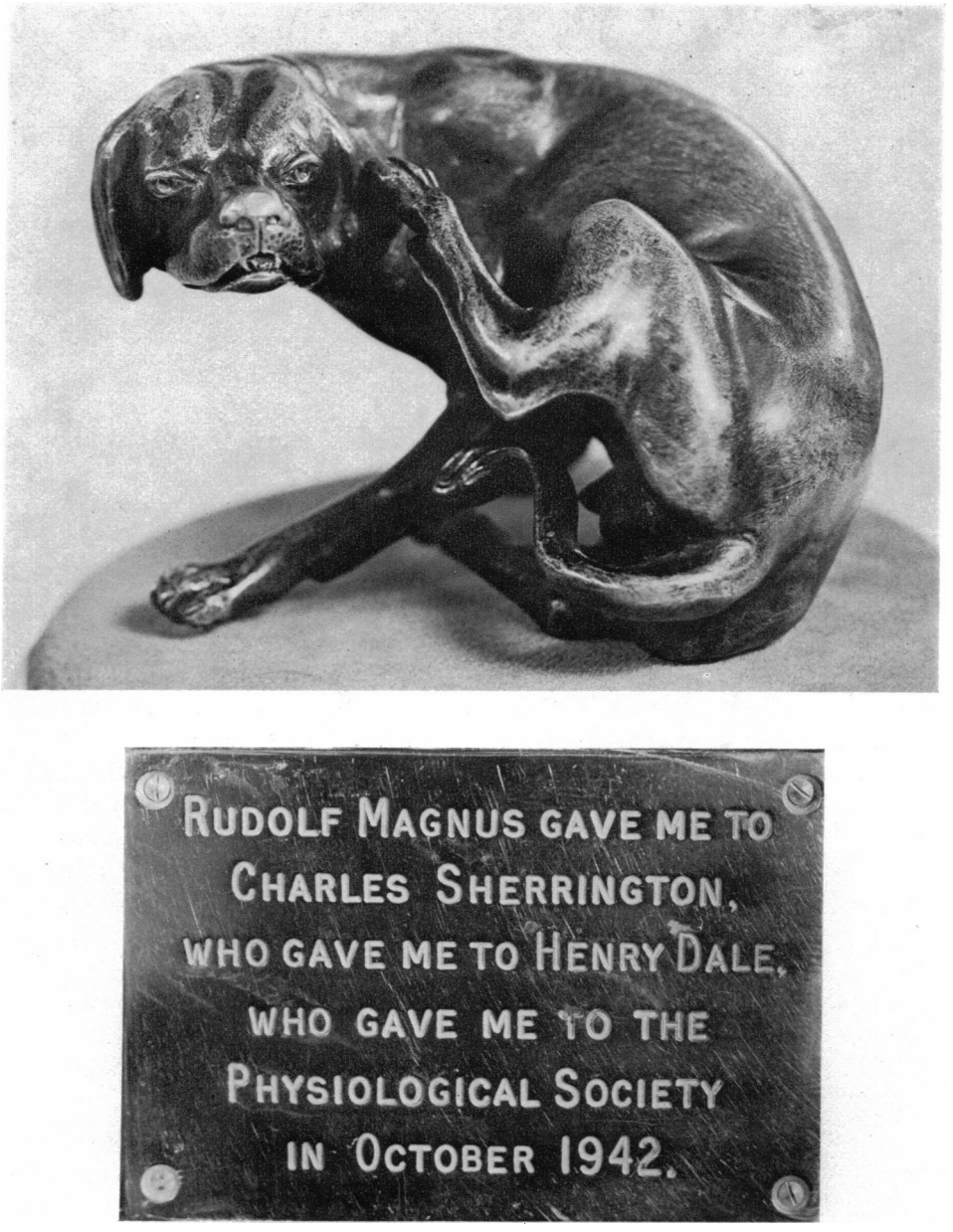

The Society's Dog

(*Facing p.* 23)

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A SHORT HISTORY OF THE PHYSIOLOGICAL SOCIETY 1926–1976

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In 1966 the late Professor H. P. Gilding was asked by the Committee of the Physiological Society to prepare a history of the Society from 1926 to 1976. This work was to be a continuation of the history which Sir Edward Sharpey-Schafer wrote to commemorate the Society's first fifty years. Professor Gilding was eminently qualified for the task, since he had been active in the Society since 1925, and had been on the Committee almost continuously between 1934 and 1961, including nine years as Treasurer from 1945 to 1954. He undertook the Society's request with a will, and before his death in 1973 chronicled the Society's activities from 1926 to 1969. He systematically combed the Society's archives, now deposited in the library of Churchill College, Cambridge, and was able to supplement these tangible remains with his own intimate knowledge of the events and people whose historian he had become. This *savoir* gave him certain decided advantages over the present writer, who is a professional historian of medicine. Unfortunately, however, Gilding was perhaps too enthusiastic, for his somewhat intimidating manuscript of nearly 500 pages contains too much detail about individual meetings, the number of communications and demonstrations, attendance, and cost of lunch, tea, dinner, and accommodation, and rather too little about the development of physiological ideas during the last half-century. Although his manuscript would have been prohibitively expensive to publish, a copy of the final typescript is permanently available with the Society's archives at Churchill College.

On the other hand, the Gilding manuscript does thoroughly recount the Society's endeavours between 1926 and 1969 and anyone who has read it will recognize how heavily I have borrowed from it. Indeed, this present sketch is to some extent a condensation of that longer work. I have tried to select those facts and episodes which strike me as important in the Society's history. It is the selection of an outsider, however, and Society members who have actually participated in the events, discussions, and reports mentioned must read with forbearance. They must look upon this present work as a prolegomenon to what I hope will be a more

satisfactory account of what after all is the Society's main function: the fostering of physiological discovery. Over the past century experimental physiology in Britain has been a vigorous and exciting science. The Society has provided a major forum for the care and nurturing of this science, to which members of the Society have in large measure contributed. A suitable commemoration of the Society's Centenary would be a history of some of the key discoveries and debates which have enlivened the meetings over the years. Inevitably the nervous system, the muscular system, and the neuromuscular junction will occupy a lion's share of this history, since the British contribution to contemporary understanding of the way nerves and muscles work has been seminal. The Nobel Prizes of Hill, Sherrington, Adrian, Eccles, Dale, Hodgkin, Huxley, and Katz testify to the international importance of this aspect of British physiology. On the other hand, one need only recall such names as Starling, Bayliss, Barcroft, Haldane, Lovatt Evans and Florey (among many others) to realize that muscles and nerves are not the whole story.

For the past century British physiology and the Physiological Society have been inextricably linked; the history of the one reflects the history of the other. It is the belief of the History of the Society Sub-Committee that a monograph on the development of physiology in this country during the past several decades would be an appropriate commemoration of the Society's Centenary. The members of this sub-committee, Edith Bülbring, D. K. Hill, and S. M. Hilton, have asked me to prepare this monograph. This project is still in its infancy and will undoubtedly take two or three years. I shall draw on the usual published and unpublished material available to the historian. In addition, we have planned a series of taped interviews with various senior members of the Society. This portion of the project was initiated with interviews of Sir John Eccles and J. H. Burn, conducted by T. A. Sears and Edith Bülbring, respectively. Other interviews will follow and ultimately the tapes and their transcripts will be deposited at Churchill College. They should help me assess the role of the Society in the work of individual physiologists.

In the meantime, I hope that the following sketch will serve for the occasion of the Centenary itself. Since I have arranged my discussion around topics, it has sometimes been necessary to include material relating to the Society's first fifty years. I have had to treat the recent past very selectively and must beg indulgence for sins of omission as well as the inevitable sins of commission.

The Gilding manuscript has made my brief much easier. In addition, I am grateful to the members of the History of the Society Sub-Committee for asking me to do the job, for patiently answering my many last-minute queries, and for helpful suggestions on an earlier draft of my manuscript.

In addition D. K. Hill has generously supplied much information, including the material incorporated in Figs. 4 and 5. Two other Society officers, D. Noble and R. S. Comline, have also kindly answered my questions. Mrs Anne Buckland-Smith has gathered the information which appears in Figs. 1–3, and has drawn all five of them. Miss Heather Edwards has typed the several versions of my manuscript.

Quotations from the Society archives have not been specifically footnoted. In most cases, they are also to be found in the Gilding manuscript, though I have not thought it necessary to refer to it each time I used it.

THE PHYSIOLOGICAL SOCIETY, 1926–1976: CHANGE AND CONTINUITY

INTRODUCTION

When the members of the Physiological Society and their guests belatedly celebrated the Society's first fifty years with a banquet at the Hotel Metropole on 13 May 1927, they were conscious that the Society was poised between a distinguished past and a promising future. Sir Edward Sharpey-Schafer was in the Chair. As one of the few original surviving members, he was uniquely qualified to appreciate what the Society had meant to experimental physiologists in Britain during the previous half-century. He was already at work on his *History of the Physiological Society during its First Fifty Years, 1876–1926*, published later the same year. In the closing paragraphs of that monograph, which he accurately termed 'the domestic record of the Society', Sharpey-Schafer pointed out that

> No account of its history can be considered complete which does not refer to the influence it has had in promoting the study of the science for the advancement and protection of which it was instituted. All important advances in Physiology made in Great Britain during the period with which we have been dealing have been brought in the first instance before the Physiological Society: it would require a considerable volume even to indicate their titles. But fortunately this is not necessary, for the *Journal of Physiology* since 1883 onwards contains a continuous account of the communications which have been made by its members – a record of which any Society may be proud [Sharpey-Schafer, 1927, p. 181].

The significance of the Society for the development of physiology in Britain was beyond dispute. Perhaps of even greater moment, British physiology occupied a position of unchallenged leadership within the international context. On the occasion of the fiftieth anniversary celebrations the Society had duly received letters of congratulation and solidarity from similar societies and from leading physiologists throughout the world. Writing as President of the American Physiological Society, Joseph

Erlanger recalled that Michael Foster's English pupil Henry Newell Martin had been a founder and first secretary of Erlanger's own society:

> Your Society [Erlanger wrote] has every reason to feel proud of its achievement. While the British, beginning with Harvey, have consistently made great contributions to physiological science, all will agree, I am sure, that the greatest epoch in British physiology coincides in general with the life of your Society. It has been during this period that the development has taken place that has given to Great Britain the acknowledged leadership in this field of endeavor.

In a letter of dubious English but genuine sentiment, the Russian physiologist I. P. Pavlov added his own best wishes to the celebration:

> Congratulation to the Physiological Society on the completion of the fiftieth year of its existence.
>
> I wish to congratulate respectfully and hotly the celebrator of the jubilee. I should make an unpardonable mistake if I would consider the Celebrator to be during these fifty years only a witness of the progress, which has led the British Physiology to the present brilliant and eminent position. No, it is just, I should recognise the Celebrator as the chief factor, the author of this progress. Being fortunate in being honorary member of the Physiological Society and receiving regularly the announcements of the places of meetings and of the programme of the Demonstrations and Communications I was long ago and incessantly persuaded of the fact how intimately the Society has united the British Physiologists and how widely and deeply with joined efforts the field of Physiology has been cultivated.
>
> That is why, remembering the proverb: let well alone, I am led only to express my wish, that in future the Society would go on fertilizing Physiology, as it has done until now.
>
> Honorary member of the Physiological Society
> I. P. PAVLOV
>
> Leningrad
> 2. v. 1927

Behind the assessments of Sharpey-Schafer, Erlanger, and Pavlov lay the recognition that in certain fundamental ways, British physiology was inconceivable without the Physiological Society.

Is a similar categorical assessment still valid fifty years later? A definitive answer is elusive, but there are clear reasons today mitigating against the intimate and virtually total association between the Society and physiology in Britain characteristic of the period covered in Sharpey-Schafer's *History*. These reasons are not unique to physiology. They are inherent in the massive growth and increasing technicality of all branches of science during the past several decades. Today, large meetings with split sessions, divided personal loyalties to several specialized scientific organizations, and multiple-author papers are the norm. Science is more impersonal than it once was, and it is difficult if not impossible for any society to play the same role in the lives of its members as the Society did in its early days.

An insight into the meaning of the Society to some of its founders and

early members can be gleaned from some reminiscences which Sir Charles Sherrington shared with his colleagues at a meeting of the Society in Cambridge on 1 October 1941. Sherrington's associations with the Society went back almost to the beginning, and the brief portrait of those early associations was enlivened by his own appreciation of the rich and lively humanity of his fellow physiologists. According to K. J. Franklin, who possessed a verbatim record of these reminiscences, Sherrington recalled to the Society:

There comes a time when one has to perceive that one is sufficiently a back number to acquire a sort of interest which I think is best to call antique. I think I first dined or attended a meeting of the Society in 1883 when the Dinner was the meeting. I was a guest brought by Mr Langley as he then was. A lecture theatre was available but its size was such that it so swamped those present that we didn't go there for the meeting. Dr Gaskell gave a demonstration on the heart showing the research he was engaged on at that time. He was a handsome genial man with a resonant voice and he called from time to time in a stentorian tone for a fresh smoked drum. Mr Langley demonstrated differences in the histology of resting and active digestive glands and in doing so disproved the traditional view prevailing at that time, that the more the glands secreted the more granular they got. He gave me many valuable lessons in the techniques of histology. One day he was in a brown study, he had his pipe in his mouth walking backwards and forwards and presently he walked to the water tap at the end of the room, took his pipe out of his mouth and put the bowl under the tap and put the water on. He seemed very much surprised at what had happened. Michael Foster was in the Chair. He was a great organiser busy with many things but I never saw him do any demonstrations whatever. Gerald Yeo was there, a very genial and charming man and excellent linguist. He seemed to know personally all the physiologists on the Continent, and they all held him dear and he them. Burdon Sanderson and Schafer were there. In his own laboratory Sanderson would demonstrate electrical apparatus and experiments. Schafer was a very constant attendant, he was a histologist and experimentalist and a great teacher too. About ten years later George Oliver and Schafer gave the most dramatic demonstration I ever remember. They made extracts of adrenal glands and injected a little into the circulation. The effect was so great that I thought that the mercury would overflow the blood pressure tube. That was one of the uses of the Society but it did not appear till later, certainly for something like 18 months. It was their discovery, quite fresh, and nothing like it had been seen before. Several physicians were there – Sidney Ringer of University College, David Ferrier of King's College, Pye-Smith of Guy's and Felix Klein a histologist and bacteriologist. Ferrier had, I suppose, ten or twelve years before made his experiments on localisation in the cortex. He was much hampered by anti-vivisectionists. They prosecuted him for the experiments he had done on the monkey's brain. He won the action hands down, so perhaps they were not so much in his way after all. Speaking of Langley going into a brown study, which I think was very unusual for him, there was one of our members proverbially absent-minded, that was Burdon Sanderson. There were many tales about him but I remember being present in his study upstairs at home with about 8 or 9 others when Gaskell embarked on a long dissertation on his current theories. After a time the dinner bell rang but Gaskell continued the argument; in the end Lady Sanderson called upstairs that dinner was served. Gaskell went downstairs followed by Sanderson and the rest of us. The dining room door was open and Lady Sanderson already seated at the table. Gaskell, still propounding his views, goes to the head of the table, seats Sanderson

on his right and began to carve; suddenly looking up at his hostess, said: 'Pardon me, I thought I was in my own house.' That made two absent-minded members at the same time.

Looking back at those days the impressions, which will always remain while I have a memory, were of an intimate informal association of physiologists. This can only have come from the older men, their understanding and nature to make the younger men feel at ease, to treat them just as if we were a fraternity and it was just like a brotherhood. Also they were too modest to realise the magnitude, as it has proved, of what they were really creating. I think they did it just because they felt, and I am sure it was the general feeling at that time, that in our country physiology had been allowed to lapse and was not cultivated.

Sherrington's comments underscore several important characteristics of the Society in its early days. Small and informal, for several years it served chiefly as a dining club for a group of men concerned with the advancement of physiology in Britain. Only a sprinkling of the original members were professional physiologists; most were either physicians or gentlemen with various vocations whose devotion to physiology was no less real because it had to be shared with other commitments. The Society was founded at a time when science – particularly in Britain – offered relatively few careers and little financial security. Indeed, one initial stimulus for banding together had been the activities of anti-vivisectionists who sought to abolish or seriously to curtail the practice of vivisection (and hence of experimental physiology) in this country (French, 1975). The lack of institutional security and the threat posed by the anti-vivisectionists actually increased the cohesiveness of the Society. Intimacy and cohesion were also aided by the fact that the Society revolved primarily around a London–Cambridge axis. It was a natural axis. London contained University College, where William Sharpey had successfully taught physiology for many years (Taylor, 1971); also in London there were the many hospital medical schools with their scientifically minded staffs, and the rich profusion of scientific societies, with their libraries and opportunities for intellectual contacts. Cambridge was the home of Michael Foster and a growing school of experimental physiology, of which Gaskell, Langley, Sherrington, Hill, Adrian and many others were products (Geison, 1971; French, 1975).

These were some of the factors which helped define the initial style and prevailing ethos within the Society. The strength of the Society *qua* Society stemmed largely from the sense of solidarity, intimacy, and fraternity which it engendered, and from the frequent opportunities which it afforded for members to exchange ideas, techniques, and discoveries.

Much of the Society's present strength still derives from these two principal functions, but naturally there have been numerous structural and functional changes within the Society during the past century. However, there has been continuity as well as change. Indeed, much of the 'domestic

history' of the Society can be understood as a series of strategies by members – and in particular by the Committee – to preserve these basic features of the Society against the demands of growth, specialization, and professionalization. By reviewing some of these strategies we can get an overview of the internal dynamics of the Society within the past fifty years.

GROWTH OF THE SOCIETY, 1926–1976

The Society has been steadily growing from the very beginning. There were twenty-two members present at the inaugural meeting held at the Criterion Restaurant, Regent – now Piccadilly – Circus, on 26 May 1876. By 1926 membership had reached a total of 385, including eight Honorary Members. Membership has continued to climb and now stands at well over

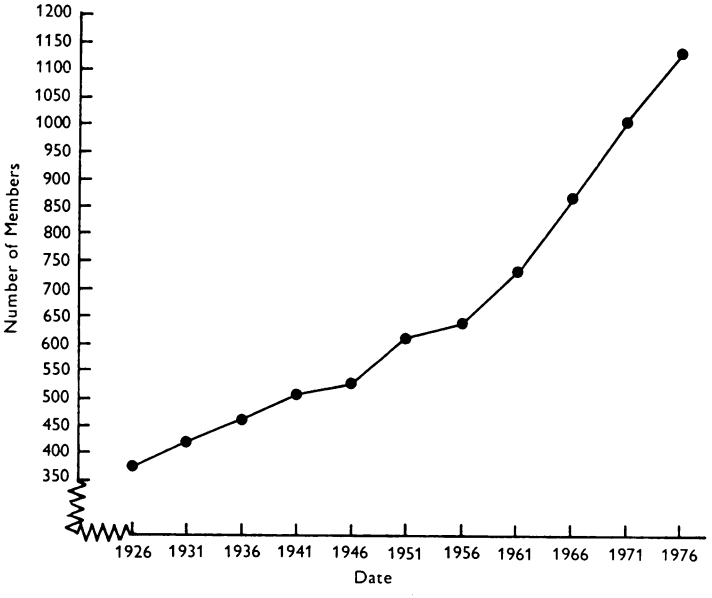

Fig. 1. Ordinary Membership 1926–1976.

1,200. As can be seen from Fig. 1, growth has been fairly evenly distributed throughout the period. It reflects the increased numbers of physiologists doing more physiological research in this country. This in turn has been permitted by the expansion of existing physiology, pharmacology, anatomy and biochemistry departments, the creation of new ones in new universities and medical schools, and the increased level of government support for research in the basic medical sciences.

Taken as a whole, the phenomenon of growth has undoubtedly been salutary, and the Society has been the obvious professional forum for this growing band of physiologists. But size can be achieved only at the expense of intimacy, and Sherrington was not alone in believing that this latter quality was one of the real strengths of the Society in its early days. On several occasions during the past half-century the Committee has concerned itself with the problems arising from size, and while no one has suggested that growth should not be permitted, various policies have been adopted which seek to minimize the disadvantages of rampant expansion.

One obvious way of maintaining some degree of unity within the Society has been through limiting eligibility for membership to British physiologists or to those with several years' work in British laboratories at the time of proposal. In a small country like Britain meetings can be attended with relative ease by physiologists from all parts of the country. A frequent meeting schedule such as the Society has always had loses its integrative function if a large portion of the members are scattered throughout the world.

Until 1939 the Society had only two categories of membership, Ordinary and Honorary. A proposal to establish a category of foreign or associate membership was defeated by a vote at the Semi-Annual Meeting in October 1929.

In the meantime, the procedure for proposing candidates for ordinary membership was formalized in 1933 when A. V. Hill produced a standard nomination form for proposers. It replaced the rather haphazard way in which the names of candidates had been brought before the Committee either verbally or by letter. The new procedure – which with slight modifications is still in use – helped guarantee that candidates generally were or had been at some time actually engaged in physiological research. This in turn prevented the Society from being diluted with members whose primary interests were peripheral to physiology.

Science is an international affair, however, and many members felt that there should be some way of maintaining formal contact with foreign physiologists, particularly those who had spent time in British laboratories. In 1939 the long-debated category of foreign associate was finally established for foreign physiologists not permanently resident in the British Isles. Foreign associates (eventually called 'Associate Members') were to be elected in the same way as ordinary members, and they were entitled to receive the Rules, Lists of Members, notices of meetings and precirculated communications. They could attend the scientific meetings of the Society but did not receive the *Journal of Physiology* or *Physiological Abstracts*, and they could not vote. This category of membership is considered to be an honour and is generally reserved for foreign physiologists who have spent at least several months working in Britain. The growth in associate membership is shown in Fig. 2.

These various categories of membership were further considered in 1950 when a subcommittee consisting of Sir Henry Dale, C. Lovatt Evans, H. P. Gilding, A. L. Hodgkin, and D. Whitteridge investigated the optimal size of the Society and the qualifications of candidates for membership. They recommended that between twenty and twenty-five candidates should be elected annually, and that preference should be given to candidates actively engaged in research. They also emphasized that foreign associate members should have worked at some point in Britain. In the following year the subcommittee further clarified its recommendations about the ideal ratio of 'conventional' to 'unconventional' physiologists, and about the admission of persons of standing in other sciences. In 1952

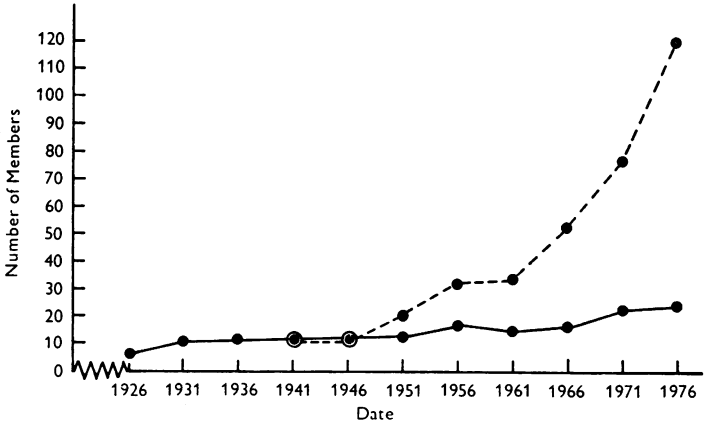

Fig. 2. Honorary Membership 1926–76: Foreign Associate and Associate Membership 1939–76. Honorary membership, ———; associate membership, – – – –.

the Committee decided to relax slightly its restrictions on foreign candidates and to reserve the right to nominate each year for ordinary membership one Commonwealth physiologist who had not necessarily qualified by working in Britain for two years.

With minor changes, these guidelines have served to the present day. However, an increasing backlog of nominees led to the establishment in 1956 of another subcommittee consisting of A. V. Hill, W. D. M. Paton, and A. T. Phillipson. They presented an extensive analysis of the factors involved in the growth of the Society and of the criteria by which qualification for membership should be judged. They pointed out that the median year of taking the first degree was (for the candidates in 1956) approximately eight years before proposal for membership. This would yield a median age of about thirty years, and a median age of election of about thirty-one years. They then calculated an average expectation of

membership in the Society of approximately thirty-five years. Using these figures, they pointed out that at equilibrium the size of the Society would be the annual election rate $\times 35$, or:

at 20/year elected = 700 members
at 25/year elected = 850 members
at 30/year elected = 1050 members

With a membership in 1956 of 639, the Society was not at equilibrium.

The subcommittee then noted that admissions policy of the Pharmacological Society followed the general practice of the Physiological Society; and that the Biochemical Society permitted entry virtually on application and was consequently much larger, with an entry rate between 1953 and 1956 of eighty-one per year. As they commented, 'A comparison of the rate of growth of the Physiological and Pharmacological Societies with that of the Biochemical Society, suggests that unrestricted entry leads to a higher nomination rate.'

Hill, Paton, and Phillipson then examined the Society records at selected intervals back to 1937 in considering the problems relating to the latency between nomination and election, size of the waiting list, and the rates of nomination and election. They pointed out that elections in the early 1950s had been higher than the theoretical rate of twenty-five per year, partly because resignations had increased after the annual subscription was raised from £2. 2*s*. 0*d*. to £4 in 1953. (Nominations averaged about thirty-one per year between 1950 and 1955.) After documenting the steady rise in the number of working physiologists in Britain between 1947 and 1956, they concluded that the Society could expect a continuing pressure for membership and, once equilibrium size of the Society was reached, a growing waiting list and latency time.

Turning to the criteria for nomination, the subcommittee reiterated that membership in the Society '*should continue to be regarded as being a credit and a distinction*' (emphasis in original). Some assessment of the merits of the candidate should still be attempted. While this implied some restriction of membership, they stressed that 'entry should be open to anyone whose work is good enough, provided it is connected with physiology, regardless of age, type of work, or place of work'. They further recognized that:

(1) Suitable candidates should be able to become members while still fairly young.

(2) It is undesirable to restrict entry so much that departments engaged in physiological work or teaching do not normally have a member on their staff.

(3) Long waiting lists are difficult to deal with, discouraging to candi-

dates, and must tend to increase the age of election even if candidates come to be nominated somewhat earlier than at present.

Finally, Hill, Paton, and Phillipson made their recommendations:

> (1) The present manner of choice of candidate for nomination should, in general, be retained. In selecting candidates, a definite allotment should be made for 'general candidates' who have made a contribution to physiological science in a wide sense other than by their personal research in physiology (i.e. administrators, heads of departments in industrial firms, clinicians, or teachers). It might be worth considering the grouping of candidates in two categories only ('ordinary' and 'general') rather than in the present categories into which it is sometimes difficult to assign candidates.
>
> (2) As an alternative or supplement to an increase in the election rate, if such is deemed necessary, an occasional 'extraordinary election' should be held at which a special list of candidates is nominated in addition to those included in the nominal annual election rate. Such a procedure could be used at the Committee's discretion and would avoid the establishing of a precedent for a much increased annual election. Such 'extraordinary elections' would also be much more effective in reducing a waiting list than (say) an increase in annual election rate by 5/year.

At the request of the Committee, the subcommittee elaborated their distinction between 'ordinary' and 'general' candidates, and since 1956 the policies laid down in this Report have formed the basis for selection of candidates.

Over the past twenty years, admission policies have had several effects on the size, composition and operation of the Society. Firstly, because of the undesirability of large waiting lists and long delays between nomination and election, the Society has never reached an equilibrium state. Instead, with the gradual increase in the number of candidates, membership has also gone up. In the 1960s, with an average yearly admission rate of about forty-five, equilibrium would be reached with a Society membership of about 1,575. At the A.G.M. in 1975, S. M. Hilton reported that admission of ordinary members had dropped to forty during the previous year. It remains to be seen whether this represents a new trend or is merely a temporary fluctuation. However, it is possible that economic and other factors will impose limits on the number of physiologists working in Britain and the Society will reach equilibrium within the admission policy framework which has hitherto led to steady growth.

Secondly, the Society some years ago reached a size which was incompatible with the informality to which Sherrington referred. This fact has been lamented by members in various reports, minutes, and asides, but it is simply a part of modern science. Faced with the choice of becoming an élitist, unrepresentative group or a larger but representative one, the Committee wisely chose growth. But the loss of informality has been keenly felt by many senior members, and it has led – particularly

in the larger meetings at University College London, Oxford, and Cambridge – to split sessions and to a general dropping off of attendance at the sessions. The Society has not been reduced to the practice (adopted by the London Company of Surgeons in the eighteenth century) of paying its officers to attend official lectures, thereby guaranteeing an audience. But as the Society Secretary noted of the 1953 Cambridge meeting, when fine weather and a lengthy programme inspired absenteeism, 'Members bore up bravely and despite the excellent weather, it was only for brief periods that a theatre contained less than 10% of those attending.'

Added to the difficulties of large meetings (if not always large attendance at the actual communications and demonstrations) has been the natural increase of communications and demonstrations to be fitted into the programme. The 1953 Cambridge meeting referred to above included sixty-five communications during the two-day meeting. This established a Society record, not broken until sixty-eight communications were read at the 1975 Cambridge meeting. But the success of such an ambitious undertaking depends on the co-operation and goodwill of the speakers, who must be strictly limited to their allotted time. The Society's Domestic Rules make this quite plain: after specifying that 'No Communications shall be read' (Rule 8), Rules 9 and 10 continue:

(9) A statement explanatory of a Demonstration shall not occupy more than five minutes. A communication shall not occupy more than ten minutes. Should a cinematograph film occupy more than ten minutes, the Member or Visitor showing it shall inform the Secretary of its duration, and the Chairman and Secretaries shall decide when it is to be shown to the meeting.

(10) In the discussion following a Communication no participant shall speak for more than five minutes unless special permission be given by the Chairman, and the whole discussion shall not last for more than fifteen minutes. At the end of this time, the Chairman may terminate the discussion by calling upon the author of the Communication to reply, such reply not to exceed five minutes; or he may ask the Meeting to decide by vote whether the discussion shall be further continued.

The Society has become noted for its elaborate system of electronic gadgetry designed to remind the speaker that his minutes are fleeting. At a meeting at St Bartholomew's Hospital Medical School in 1958 the space age was welcomed by the substitution of a 'bleep' from an impressive representation of an earth satellite in place of the conventional traffic lights and bells.

Society members have become accustomed to operating within the limits imposed by lights and bells, though a few chronic offenders against the time system have become legendary. On the other hand, guests are harder to predict and occasional long-winded overseas visitors have been anonymously immortalized in minutes composed by long-suffering Secre-

taries. A meeting in Aberdeen in September 1967 was particularly notorious when

> two [communications] by colleagues from the United States demonstrated once again their country's belief in the rights of the individual over that of any authority, including meetings chairmen. Speakers continued with rare equanimity, though barely half way through their collection of slides, through lights, bells and buzzers.

Sometimes, however, the system can be unexpectedly efficient, as at a meeting in 1957 at King's College, London. The Chairman, R. J. S. McDowell, took the programme at such a smart pace that authors of late communications, who had expected to perform after lunch, had either not arrived or were slideless and therefore speechless.

Finally, W. D. M. Paton's analysis of the meeting at the National Institute for Medical Research at Mill Hill in February 1954 suggests that even within the constraints imposed by the time system, there is ample room for wry humour and individual expression. His minute reads in full:

> Sir Charles Harrington, W. Feldberg and W. L. M. Perry successively took the Chair. After the dinner on Friday evening, G. L. Brown, speaking as a Hampstead 'old boy', proposed the thanks of the Society to the Director, Dr Feldberg and their staff.
>
> The attempt by R. C. Garry and J. S. Gillespie to legitimate the term 'orthosympathetic' as a twin to 'parasympathetic' aroused discussion and an alternative suggestion from B. Katz of 'sympathetic' and 'unsympathetic'. A paper on the physiological advantages of dripping with sweat was hotly attacked for its ideology and elicited some holiday reminiscences. At the other extreme was a demonstration by Parkes and Smith of rats in suspended animation on ice.
>
> Each speaker, when he reached the dais, was invested with electronic regalia, which amplified all the noises (intended and unintended) emanating from him and allowed the control engineer to produce some interesting effects.
>
> The main feature of the meeting was the liberal allowance of time for communications, which passed at 3·2 c.p.h. on Friday and 2·8 c.p.h. on Saturday; this permitted unusually full discussion (5·9 comments per paper). The total sum of the papers and the comments, divided by the time taken, yields an estimate of the present mental fertility of the Society at $\frac{1}{3}$ motions per minute.

Another aspect of large meetings with split sessions has been the natural tendency to arrange the parallel sessions around particular topics, thus avoiding too much commuting between lecture theatres. The attractions of such an arrangement are obvious, though too much specialization within the meetings carries the threat of fragmentation of the Society. After split sessions and subject grouping at a Cambridge meeting in 1954, the Secretary noted that the practice 'may in time lead to the separation of the Society's meetings into a series of subsections. The comments of the members show that they are aware of this danger but so far no practical remedy has been suggested.'

The problems associated with large meetings have grown more acute in recent years. Even with split sessions it has not always been possible to accept all communications, which rose from 146 in 1950 to 281 in 1967. During the past two years the meetings Secretary, D. Noble, has managed to accept all communications, with the result that 429 were presented during the year preceding the A.G.M. of 1976. In 1967 the matter had been debated by Committee. One modification which emerged was the power granted to the meetings Secretary to arrange scientific meetings in which some of the communications would be precirculated and discussed, but not given orally at the meeting. In the same year the meetings Secretary was empowered to offer up to £100 to the Chairman of any scientific meeting who wished to introduce some novel improvement at his meeting. Such strategies reflect the strong desire among members to maintain as much openness and unity as possible within the Society.

The Society's growth during the past half-century has thus led to various changes in style and format. But there are other aspects of the phenomenon of growth which have helped to maintain group solidarity. After all, there is strength in numbers and the Society's size and vigour have permitted it to remain autonomous. Although the Society has always had friendly relations with other scientific bodies, it has not been dependent on outside support for its normal activities. Details of some joint meetings with other societies are given below, but the purpose of these joint meetings has been to encourage exchange and contact with complementary bodies and not to fill out meetings for which the Society would have been unable to muster sufficient support from within its own ranks. Nor has there been need to advertise the Society's activities beyond the notices routinely sent to members. Though periodicals such as *Nature*, *Lancet*, and *British Medical Journal* have offered on various occasions to publicize Society activities, there has been no need, and the Committee has turned down such offers. Indeed, the problem has been the reverse – that of limiting the number of guests which members bring to the over-subscribed meetings in London, Oxford, and Cambridge.

Such facts suggest that the Society has been successful in striking a balance between growth and intimacy. Dining together is still an important Society activity, even if the host no longer carves the meat. And if the Society is composed almost exclusively of professional physiologists, it is still administered largely by members who donate their time and energies gratuitously. The Society owns no permanent headquarters and has never been centralized. It is run from the offices, laboratories and homes of its officers, and its frequent meetings are hosted in a variety of different locations each year. Above all, it is a peripatetic Society; Aristotle might be taken as its patron saint.

Because there are no bricks and mortar to equate it with, the Society is identified with its members: perhaps more so than any other British society with comparable stature and prestige. It has achieved a remarkable size and range of activity without an extensive infrastructure of rooms, library, and large auxiliary staff. The Society still functions through the voluntary efforts of its members. Such an arrangement demands a high level of individual loyalty, but it also creates an ethos in which loyalty is possible.

THE COMMITTEE

Sharpey-Schafer's *History* dealt only marginally with the activities of the Committee, which since the beginning has been responsible for conducting the Society's business. Originally, it consisted of seven members plus two Secretaries, one of whom also acted as Treasurer. The first Committee elected in 1877 consisted of T. L. Brunton, Michael Foster, G. H. Lewes, P. H. Pye-Smith, J. Burdon Sanderson, Henry Power, and E. A. Schafer, and as Secretaries, George J. Romanes and Gerald F. Yeo. Unlike Society membership and the Editorial Board of the *Journal of Physiology*, the Committee has increased only modestly in size over the years. By 1926 it already contained thirteen Ordinary members, and the Honorary Treasurer and the Chairman of the Board of Editors of the *Journal* were *ex officio* Members of Committee. A. V. Hill became the Society's first Foreign Secretary in 1934, and the office also carries *ex officio* membership. It became customary for the Chairman of the Editorial Board of Monographs and the Editor of the *International Abstracts of Biological Sciences* to sit on the Committee.

There has never been an official Chairman or President of the Society. In the original rules it was laid down that 'at each meeting, one of the members shall, on the motion of one of the Secretaries, be elected as Chairman'. This was sufficient as long as the Society's meetings were dinners and discussion, but when demonstrations were introduced, the head of the department entertaining the Society became Chairman of the meeting. The original rule is still followed at the Annual General Meeting. Michael Foster suggested in 1890 that the rules be altered to permit the election of a President. He was unable to be present when his motion was debated and it was defeated by the casting vote of the Chairman. However, H. H. Dale served as 'President' in all but name for a number of years. He was on the Committee from 1914 to 1938, and was Chairman for the last eleven of those years. Dale was held in affectionate esteem by the Society's junior members, who sometimes referred to him as the Pope. After Dale retired the Committee adopted a standing order regulating the

periods during which an individual may serve continuously in the same office. They included the following.

Treasurer	10 years
Home Secretaries	7 years
Foreign Secretary	15 years
Members of Editorial Board	7 years

The standing order continued:

Ordinary members of Committee shall not be proposed for re-election immediately after serving continuously for four years, but the number of retirements under this order at one time shall not exceed four. If more than four members of the Committee become due for retirement under this standing order at one time, the four members with the longest continuous service shall retire.

The conditions outlined in this 1939 standing order are still in effect. Since there is no President, it has become traditional to name the Honorary Treasurer as the senior officer of the Society.

As the executive branch of the Society, the Committee has had gradually to modify its functions as the Society's size, legal and financial positions, and activities have changed. The Committee initiates the necessary alterations in the Society's Articles of Association and Domestic Rules; and we have already noted some of the ways in which election policies have affected – and in turn been affected by – the Society's growth. The Committee also acts on behalf of the Society in relationships with other bodies and with individuals outside the Society. By the appointment of appropriate subcommittees, it was ultimately responsible for representing the Society (and by extension British physiology) before such Commissions as the Goodenough and Todd on medical education and the Littlewood on animal experimentation.

The most significant Committee concern during the 1920s related to the acquisition of the *Journal of Physiology* (see below). In fact, it was the urgency of this matter during late 1925 and early 1926 which delayed for a year the celebrations of the Society's first fifty years. Owning the *Journal* has had important financial and intellectual consequences for the Society. Among other things it has provided the Society (in most years) with a direct income, and this may have been the reason why, in 1929, the Treasurer M. S. Pembrey reported that he had received an assessment for Income Tax to be paid by the Society. This had never happened before and has not occurred again, for Pembrey challenged the assessment and succeeded in establishing with the Income Tax Commissioners that the Society qualified as a charity. The Committee has of course guarded this status carefully. For instance, it has always insisted that each member pay his own yearly subscription to the Society. Since this subscription

entitles the member to receive the *Journal* – itself worth considerably more than membership subscription – it must not be paid on a member's behalf by a library or institution. Members' copies of the *Journal* are marked accordingly and are not meant for library use.

This unwritten rule against second-party membership subscriptions was deliberately relaxed by Committee in the 1930s for Society members in Germany and Italy who found it impossible to remit personal membership subscriptions directly to the Treasurer. As a way around this impasse, the *Journal* was sent to selected booksellers in those countries, and the remitted price of the *Journal* was accepted in lieu of membership subscriptions.

These same Continental political events in the 1930s also involved the Committee with the Academic Assistance Council, an organization set up to aid refugees from the Nazis in settling in Britain. A. V. Hill was particularly active in this endeavour, which incalculably enriched so many areas of British intellectual life (Hill, 1960, chapter 4). The Committee voted financial aid to the Academic Assistance Council on more than one occasion, offered twenty-two distinguished foreign physiologists residing in Great Britain the privilege of receiving Society notices and attending meetings for one year (later extended), and aided them in finding employment in British laboratories. The Society was amply rewarded for its efforts, for during the 1930s it was enabled to elect to membership such colleagues (no longer 'foreign physiologists') as H. Blaschko, E. Bülbring, W. Feldberg, B. Katz, H. O. Schild and M. Vogt.

During 1934 and 1935 the Committee was again concerned with the Society's legal status. The position as a tax-exempt charity was secure, but the Society's growing assets (particularly the *Journal*) made incorporation of the Society desirable. M. S. Pembrey had been a Trustee as well as Treasurer, and after his death in 1934 the new Treasurer, B. A. McSwiney, was asked to obtain legal advice about the possibility of incorporation as a Company limited by guarantee. He strongly urged the attractiveness of such a move and at a special general meeting in December 1934 the Society voted to proceed accordingly. McSwiney and R. J. Lythgoe worked out the proposed articles of association, and at a meeting on 19 October 1935, with Sir Henry Dale in the chair, the Society gave its final approval:

> ...this meeting approves the proposed memorandum and Articles of Association of the Physiological Society (to be incorporated under the Companies Acts) and instructs the officers of the Society to submit the same to the Board of Trade for approval and subject to such approval proceed to obtain incorporation of the Physiological Society on the basis of such Memorandum and Articles of Association with such modification thereof (if any) as the Board of Trade may require and the officers of the Society approve.

At the Liverpool meeting on 7 December 1935 the Secretaries announced

that permission had been obtained from the Board of Trade to incorporate the Physiological Society as a limited liability company and to dispense with the word 'limited' in the title.

Committee meetings during those years had involved the officers of the Society in considerable personal expense, since travel costs to meetings had to be met out of pocket. This arrangement also made it virtually impossible for members in the north of England and Scotland to serve as officers. With the growing financial security of the Society it was possible in 1936 to recommend that the 'Society defray the expenses of any member when travelling on the Society's business apart from attending meetings of the whole Society'. Over the next few years the details of the policy were worked out. The increasing magnitude and complexity of Society affairs has also made it necessary to provide clerical assistance for various officers of the Society. This was done on a limited basis until 1958, when Committee unanimously agreed that 'adequate and adequately paid secretarial assistance should be provided for the officers'. By these informal means the Society has been able to accommodate expansion without a centralized administrative framework.

In 1936 the Committee also standardized the format regulating the publication of the Society's *Proceedings*, which have appeared in the *Journal of Physiology* since 1883. The Committee believed that the *Proceedings* should be a genuine record of the Society's meetings, and not simply a means of achieving rapid publication of short papers which thereby circumvented normal editorial scrutiny. The convention of precirculating communications intended for discussion at meetings had been adopted with success in 1933. The Committee urged members to respect the spirit of this convention and to cause to be precirculated only communications which they intended to present at subsequent meetings. As Committee pointed out:

> Some of the Communications sent for Proceedings appear to be preliminary abstracts of longer papers which are ready for publication, and to have the object, not of provoking an interesting discussion, but of safeguarding a claim to priority. The Physiological Society has never taken an interest in such questions of priority, and this is not a proper use of its Proceedings as defined by the present rule.

These general guidelines, presented by the Committee and discussed at the A.G.M. in 1936, still govern the way in which communications and demonstrations published in the *Proceedings* relate to the meetings. Members themselves vote whether to accept what appears in the published *Proceedings*, whereas the Editorial Board has jurisdiction over papers appearing in the *Journal*.

In 1937 the Committee empowered the Foreign Secretary, A. V. Hill, to open negotiations with the International Committee regarding an Inter-

national Physiological Congress to meet in London in 1941. The intervention of the war forced its postponement until 1947, when it met in Oxford (see below). The war imposed other demands on the Committee. A register of scientific men, for use in an emergency, was compiled under the auspices of the Royal Society; a special subcommittee of the Society collected and presented the relevant information on members. It was also thought necessary to appoint an assistant treasurer, should an 'unfortunate incident' prevent the Treasurer from fulfilling his duties. An assistant secretary, G. L. Brown, was also appointed, since both Secretaries were engaged on Government work. The ordinary general meeting was moved to Oxford and the Committee was empowered to arrange meeting schedules on a more or less *ad hoc* basis. The Committee also dealt with other problems created by the War, such as the provision of adequate foodstuffs for laboratory animals.

The Government set up in 1942 an 'Inter-Departmental Committee on Medical Schools' (subsequently known after its Chairman as the Goodenough Committee). The Society was asked for a memorandum outlining its views on Medical Education. H. P. Gilding drew up one, and after discussion he, E. G. T. Liddell, and W. H. Newton prepared a final draft for the Goodenough Committee. One of its recommendations was an allocation of funds for scholarships to enable medical and dental students to intercalate one year in their curriculum to read for an Honours B.Sc. Intercalated B.Sc. degrees are now available to medical, dental, and veterinary students in a variety of subjects, including physiology.

Following the subcommittee memorandum for the Goodenough Committee, a standing Educational subcommittee of the Society was established in 1943, with E. D. Adrian, R. C. Garry, H. P. Gilding, E. G. T. Liddell, W. H. Newton, R. A. Peters, and F. R. Winton responsible for preliminary enquiries into the matter. However, wartime was inauspicious for the creation of additional committee work, and no permanent educational policy for the Society had been formulated when the subcommittee disbanded.

Sir Henry Dale was President of the Royal Society during the War. In February 1944 he informed the Society of a Government scheme to develop and unify science in Britain after the War. One aspect of this plan was to be a building designed to accommodate scientific societies on a larger scale than was possible in Burlington House. Committee discussed the matter in 1944 and again in 1948 and 1951 and agreed that the Society would be prepared to participate in such a scheme. The Society's requirements were outlined on more than one occasion, though ultimately nothing came of the proposals, since the Government was unwilling to provide the necessary financing. Had the plan materialized, the Society's history during the past twenty-five years would have been considerably different.

In the early 1960s another proposal of the kind was explored under the name of the 'British Sciences Foundation'. The practical objects of the Foundation were to be the joint acquisition by several scientific societies of accommodation, and the establishment of a non-profit-making scientific publishing organization. After exploring the possibilities, Committee decided that the Society had no immediate need of accommodation, which in any case was prohibitively expensive. It also rejected the publishing scheme in favour of a continuation of the Society's own independent arrangements with the Cambridge University Press.

Since the late 1940s two major issues have come to dominate much Committee activity. We have already looked at the first of these issues – the problems connected with the growth of the Society. The second – inflation – has become an all-too familiar feature of modern life. It led to a major examination of Society's expenses and policy around 1950. Printing costs increased rapidly after the War; so did the cost of meetings and of running the Society. The bill for printing the *Journal* rose from £1778 for Volume 109 (1949) to £3120 for Volume 114 (1951). These and other factors necessitated the raising of membership subscription from £2. 2*s*. 0*d*. to £4 for 1953. It has since been raised in stages to its present figure of £12 per year. The burden which more recent inflation has imposed on Society finances and on the *Journal* will be examined in the section dealing with the *Journal*.

On the other hand, the end of the War permitted the Society to expand its activities after a period of relative quiescence. In 1950 the Committee asked the Society's Treasurer, H. P. Gilding, the Chairman of the Editorial Board, R. C. Garry, C. Lovatt Evans, and G. L. Brown to explore the feasibility of a series of monographs. This group reported favourably on the proposal and suggested a list of publishers who should be approached. A second subcommittee, consisting of L. E. Bayliss, W. Feldberg, and K. J. Franklin, looked into the practical details of the venture and recommended Edward Arnold as the publisher. A draft agreement with Arnolds was signed and W. Feldberg, L. E. Bayliss, and A. L. Hodgkin were appointed to the first Editorial Board (Monographs). The first monograph of the series, entitled *Sympathetic Control of Human Blood Vessels*, by H. Barcroft and H. J. C. Swan, was published in 1952. More than thirty volumes have now appeared in the series, which during the past few years has been published by the Cambridge University Press. In an effort to achieve greater distribution, particularly in North America, the Society now has an agreement with Academic Press for the publication of future volumes.

Another topic of perennial Committee concern has been the legal, ethical, and social ramifications of animal experimentation. This concern

of course dates from the Society's earliest years, when the passage of the Cruelty to Animals Act, 1876, cast doubt on the future of biological and medical experimentation in this country. In addition to the Society itself, another organizational response to the 1876 Act was the Association for the Advancement of Medicine by Research, established in 1882 (French, 1975). Stephen Paget became secretary to this Association, and his on-going involvement with experimental medicine prompted him to found, in 1908, the Research Defence Society. In 1917 the Research Defence Society took over the Association for the Advancement of Medicine by Research (Lane-Petter, 1957).

The Research Defence Society has become a major buffer between the general public and scientists whose research requires the use of experimental animals. Physiology is particularly vulnerable on this score, and the Society has naturally had warm relations with the Research Defence Society. For many years the Committee has approved a regular contribution to the Research Defence Society in support of the latter society's activities. Although many physiologists have publicly declared themselves satisfied with the regulation of animal experimentation under the 1876 Act (which with various modifications is still in force today) there have been occasional instances during the past half-century in which physiologists have been involved in prosecutions initiated by anti-vivisectionist groups. In 1926 E. B. Verney successfully fought a charge of wilfully receiving a stolen dog for use in experimentation (Daly & Pickford, 1970, pp. 526–527). In that same year the Society unanimously passed a resolution requesting its members 'not to apply for or accept posts in Medical Schools or in Universities or Research Institutions in which there is any restriction, in principle, in the use of animals for experimental purposes in accordance with the law'.

Connected with the use of experimental animals is of course the problem of their supply, and the Committee has co-operated with various individuals, and with the Research Defence Society, in attempting to standardize and guarantee sources of supply. More recently the Committee joined with the Research Defence Society in presenting a memorandum to the latest Departmental Commission which has investigated the use of animals in experimentation – the Littlewood Committee. These negotiations occupied the Committee between 1963 and 1965. In addition to submitting a statement in conjunction with the Research Defence Society, the Committee prepared a supplementary Memorandum of evidence dealing with matters of particular concern to physiologists (*Report*, 1965).

Although the Society has been concerned in maintaining the legitimate freedom in the use of experimental animals, it has also gone on record expressing awareness of the problem of pain caused to animals. Occasionally

papers are rejected for the Society's *Proceedings* and for the *Journal of Physiology* if the experiments described take too little cognizance of the moral and ethical dimensions of the problem. Recent discussion about these issues led the Committee to establish, in November 1975, an Ethical Sub-committee, 'to consider (i) the ethical problems raised by certain types of experimentation on animals and man, (ii) whether a code of practice can be defined to act as a guide in relation to publications of the Society, and (iii) whether publicity should be given to the Society's views and the best forms of relationship with the Research Defence Society'.

During the 1960s the Committee was also involved in providing evidence regarding educational aspects of physiology for both the General Medical Council and the Royal Commission on Medical Education convened under the Chairmanship of Lord Todd. For this latter Commission a sub-committee under K. A. Munday assessed the status of physiology in Universities and Medical Schools throughout Great Britain. By comparing the information obtained in 1966 with similar data gathered in preparation for a report to the Goodenough Committee almost thirty years earlier, a graphic record of the growth of academic physiology in this country is obtained.

	1938	1966
Professors	24	38
Readers	2	81
Lecturers	96	241

Reference to the information contained in Fig. 1 establishes that during this period academic posts in physiology have trebled while Society membership has only doubled, i.e. the percentage of academic physiologists in the Society has increased during the past few decades.

The above examples of committee activity during the past fifty years are indicative of the dual role which the Committee plays as a moulder of internal Society policy, and as the official voice of the Society *qua* Society in its relations with external individuals and bodies and with its own members. In that latter capacity it not infrequently is the pleasant task of the Committee to convey congratulations to its own members. The minute books record many such instances. Three may be taken as reflecting the richness of the attachment between Society and member. In 1928 the Committee had bound in leather a copy of Sir Edward Sharpey-Schafer's *History*, which was presented to him, together with an illuminated inscription signed by the members of the Committee. Sharpey-Schafer replied:

Park End, North Berwick
May 5, 1928

My dear Hill,

Warm blood would be a more appropriate fluid than cold ink to record my appreciation of the exquisite gift I have received through you from the Committee

of the Physiological Society. During an inordinately long career I have experienced no such pleasurable thrill as that caused by the return to me – in so attractive a guise and accompanied by an address so charming in word and embellishment – of the 'litel boke' I lately wrote at the invitation of the Society as a record of the first fifty years of its activities.

My friendship with the donors, the character of the gift, the happy thought which inspired it, and the affectionate terms of the 'envoy' have each and all contributed towards this feeling.

I beg you to convey to the Committee and the Society my grateful thanks for their delightful present; which, while I live, will be a valued possession, and will, afterwards, I feel sure, be no less treasured by my family and descendants, to whom I could not desire to bequeath a more worthy legacy.

Yours v. sincerely
E. SHARPEY-SCHAFER

The Society presented to Sir Charles Sherrington an edition of five books of Galen (printed by Simon de Colines in 1534) on the occasion of his 90th birthday on 27 November 1947. Sherrington wrote back:

20th November 1947
Eastbourne

My dear Whitteridge,

I write to ask you to convey to the Physiological Society my heartiest thanks for their kind wishes. It is a privilege to accept them. My reminiscences reach back almost to the Society's earliest years. The Society will therefore I think understand that it is with unusual wealth of feeling that I received the Society's good greetings and the generous message.

I have had an unbroken stream of encouragement and friendship from the Society which I am quite unable to repay. By token of return all I can do is to wish the Society long continuance of their remarkable prosperity. Their prosperity is, and long has been, a sign of the welfare of science in our modern world. Physiology – our Physiology – has the twofold joy of both journeying and arriving! That, we all recognise, is Physiology's reward.

But my thanks would be even less complete did I not tell of my gratitude for the noble book, a gift from the Society. A memento at once splendid and choice, from the best press in France and of the best period! 'A thing of beauty is a joy for ever', the famous words first written next door to 'Guy's' apply to it. Would I could better thank each and all of you.

Sincerely yours
C. S. SHERRINGTON

In 1955, E. D. Adrian became the first physiologist to be elevated to the peerage. Replying to the Committee's warmest congratulations, Adrian wrote on 22 January 1955:

Dear Paton,

I am most grateful to you, to the Physiological Society, for the kind message you have sent me.

You won't need my assurance that the good wishes of my colleagues mean a great deal to me. We owe so much to the Society for the way it has trained us at the meetings and in the Journal, that any distinction *au pair* reflects what it has done

for us. It has been a great regret that I have not been able to come to the meetings more often in these past few years, but at least I can promise that the attractions of the House of Lords will not make me forget that I am a physiologist.

Yours sincerely
E. D. ADRIAN

In 'these past few years' Adrian had been President of the Royal Society, a position which members of the Society have occupied for thirty of the past sixty years.

MEETINGS

The meetings of the Society are its central activity. As we have already seen, much of the strategy relating to the Society's internal development has been aimed at maintaining an organizational structure within which the regular scientific meetings would continue to be profitable to members. Meetings have always been at the heart of the Society, for the second of the Society's original Rules reads:

The Society is instituted for promoting the Advancement of Physiology and facilitating the intercourse of Physiologists.

Meetings serve both of these functions.

The basic pattern of meetings was established during the Society's first fifty years, though, as has been noted, various modifications have been made to accommodate the demands of growth and specialization. Early on, the introduction of demonstrations forced a move of primary venue from the restaurant to the laboratory and lecture theatre. More recently, the continued growth of the Society has put pressure on many of the established places of meeting – almost invariably universities, medical schools, or research institutions. One argument in favour of permanent headquarters for the Society has been the complexities in local arrangements for the large numbers now involved. Attendance of between 200 and 300 has become routine and special occasions, such as the Dale Centennial Symposium in 1975, or the Centenary Meeting of the Society itself, attract considerably larger attendance. More than 700 people attended the Centenary Dinner in July 1976; by contrast, 174 members and guests were present at the banquet in honour of the Society's first fifty years.

During the Society's first seventy-five years, two-day meetings were exceptions; they have since become the rule. Discussion of communications was formerly carried on at a more leisurely pace, and, since there was less pressure on physiologists to amass a lengthy bibliography, communications were not necessarily published in the Society's *Proceedings*. For example, in the late 1920s only about one third of the communications subsequently appeared in the *Proceedings*. Communications and demon-

strations thus served as primary vehicles for conveying information and as linchpins for discussions, rather than as ways of increasing one's bibliography.

On the other hand, if meetings are larger and more formal than they once were, they are also held in a greater variety of localities and are thus ess likely to be chaired and dominated by the same individuals each time. The expansion of physiological research in this country has occurred at the relative expense of the London-based influence. In so far as mobility of the Society's meetings encourages more widespread participation and diffusion of power, the problems created by growth have been countered. For instance, in 1897 the Society held eight meetings (including one in the private laboratory of a member). Six of these were in London, with only Oxford and Cambridge included in the provincial circuit. But by 1925 the modern pattern was beginning to take shape. In that year only three of seven meetings were in London, the others being in Cambridge, Edinburgh, Cardiff, and Leiden. In 1958 London institutions were host to four of the eight meetings; others were held in Leeds, Oxford, Cambridge, and Glasgow. A decade later, in 1968, the Society met in London four times, as well as in Manchester, Edinburgh, Oxford, Cambridge, and Leicester. The Leicester meeting, the first in that city, was held jointly with the Anatomical Society.

These samples of meeting localities at intervals over the past eighty years suggest that London has been the chosen site for about fifty per cent of the Society's meetings during the past half century. While this represents a decrease from the almost exclusive London schedule of the Society's earliest years, it still represents a significant bias towards London, considering that only a minority of Society members now live and work in the Capital. In 1968, when four of the Society's nine meetings were in London, only about twenty per cent of the ordinary members worked in the Capital. There are of course practical reasons for this London weighting, since public transport makes London more accessible than many provincial cities. But the phenomenon is partly historical, for tradition had made certain stops on the London circuit established Society ritual. The old London–Cambridge axis – with Oxford now included – is still a vital element in the Society's operation.

It is of interest to note that the issue of London domination was discussed as long ago as 1932, when H. S. Raper specifically proposed that more meetings should be held in the provinces, since even then it was apparent that the discussions of communications could be more extensive at such meetings. But as A. V. Hill pointed out, this was simply because fewer communications were offered, and fewer members could attend, so the advantages of provincial informality were not purchased for naught.

Except for the War years, when external factors made meeting in London difficult, the basic pattern has changed remarkably little during the past few decades. However, the number of provincial localities which have been host to the Society has increased, as the partial list of dates, places and institutions of first Society visits shown below indicates.

Date	Locality	Institution
1929	Birmingham	University
1929	Plymouth	Marine Biological Association Laboratory
1931	Aberdeen	Marischal College
1943	London	University College Hospital Medical School (Dept. of Clinical Research)
1946	London	Royal Veterinary College
1948	Dublin	Trinity College, University College, and Royal College of Surgeons
1949	St Andrews	University
1960	London	Queen Elizabeth College
1963	Southampton	University
1965	Galway	University College
1965	London	Zoological Society (Regent's Park)
1967	London	Institute of Psychiatry
1968	Leicester	University

Since there have been more than 350 Society meetings during the past half-century, only a minority can be mentioned.

The Society's fifty-first year got off to an inauspicious beginning, for the meeting scheduled for Cambridge on 15 May 1926 had to be cancelled because of the General Strike. It was subsequently held on 5 June, with ten communications and seven demonstrations. One of the demonstrations was given by W. Feldberg, who, after being introduced by J. Barcroft, thus made his debut before the Society. At the Annual General Meeting at University College the following year, E. H. Starling gave his last demonstration to the Society. His health was already deteriorating, and he died six weeks later on a ship in the Caribbean. The Society has recently made a donation towards the upkeep of his grave in Kingston, Jamaica, and his memory, along with that of his friend and colleague, Sir William Bayliss, is commemorated in the special Bayliss–Starling Lecture which is delivered to the Society triennially. Sir Charles Lovatt Evans inaugurated the series in 1963, and subsequent Bayliss–Starling lecturers have been I. de Burgh Daly, A. V. Hill, R. A. Gregory and H. Barcroft.

A secretarial report at the 1928 Annual General Meeting has a modern ring, for the Secretaries noted that 'The interest in the meetings would be greater if there were rather fewer papers and more discussion'. By contemporary standards, the number of communications and demonstrations presented in those years was quite small, but meetings rarely began

until 3 or 4 p.m. on Saturday afternoons, since members were unable to absent themselves from other duties on week-days.

The minutes of the meetings during the late 1920s and 1930s record many communications, discussions and announcements of interest. At the Cardiff meeting in 1929, the Secretary was instructed to send letters of congratulation to Sir F. Gowland Hopkins and to Professor A. Harden on the occasion of their Nobel Prizes in medicine and chemistry respectively. This brought the number of Nobel Laureates among ordinary members to six – the others being August Krogh, A. V. Hill, J. J. R. Macleod, and F. C. Banting. Sherrington and Adrian were to join this select group three years later, and the announcement to the Society was also made at a Cardiff meeting.

During the past decade it has become customary for the Society to go abroad for a meeting almost every year. Such occasions were less frequent in the years between the two World Wars, but in April 1930 the Society had a meeting in Belgium as the guests of the Department of Physiology, University of Louvain. On the day before the scientific sessions, the minutes record,

> the members of the Physiological Society and their guests were received at the Royal Palace in Brussels, by their Majesties the King and the Queen of the Belgians, the Crown Prince and the Crown Princess, in order that they might see the Harvey film. Sir Thomas Lewis gave an explanation of the origin of the film.*

The joint scientific meetings occupied the morning and afternoon of the following day. In addition, the members and their guests were entertained by the Burgomaster of Louvain and by the Faculty of Medicine of the University. During the course of the proceedings, the University's Rector and the Dean of the Medical Faculty conferred Honorary Doctorates of Medicine on E. Sharpey-Schafer (*in absentia*), F. G. Hopkins, H. H. Dale, and A. V. Hill.

Although Sharpey-Schafer had been unable to make the journey to Louvain, he was present at a Society meeting in Edinburgh on 7 June 1930, where his 80th birthday was celebrated. He presented both a communication and a demonstration – his last. However, he had several more active years left, and it was not until 1935 that his death severed the last connexion between the Society and its founding members.

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* Queen Elizabeth of Belgium had done nursing service during the 1914–18 War; in this capacity she had met several British physiologists. It was she who had requested that the film be shown. Lewis and H. H. Dale had been medical advisers for the film, made in 1928 to commemorate the tercentenary of Harvey's *de Motu Cordis*. This excellent film has since been remade on two occasions. It is one of a large number of films on many aspects of physiology which the Society has acquired over the years. The Society's film collection is now housed at the British Film Institute.

At the Annual General Meeting for 1931, the Treasurer distributed for the first time a printed 'Statement of Receipts and Payments for the year January 1st 1930 to December 1930'. An idea of the cost of running the the Society can be gleaned from the following extracts:

To cost of meetings, presentation, printing of rules	£210	6*s*.	7*d*.
Printing Proceedings	67	14*s*.	6*d*.
Donations (to Research Defence Society, etc.)	65	0*s*.	0*d*.
Treasurers expenses. Purchase of safe	8	15*s*.	0*d*.
Treasurers expenses. Stamps, stationery	3	2*s*.	10*d*.
There were no secretarial expenses.			

Although there was no balance sheet, Society assets in 1931 included War Loans, £1000; cash on deposit, £732. 10. 5*d*.; and unsold stock of the *Journal*, Sharpey-Schafer's *History*, and *Physiological Abstracts*.

The continued success of the *Journal* in the face of the world-wide economic depression of the 1930s kept the Society finances healthy. Among other things, profits from the *Journal* were used to subsidize publication of *Physiological Abstracts*, which J. Mellanby edited for many years. Since incorporation of the Society in 1935, the yearly financial statements of the Treasurer have been audited by external accountants.

The Oxford meeting in 1935 marked a double milestone for C. S. Sherrington: his fiftieth year as a member of the Society and his retirement from the Waynflete Chair of Physiology at Oxford. On behalf of the Society, H. H. Dale presented him with a scroll which conveyed members' affection for their distinguished colleague. In the following year it was Dale's turn to receive the Society's warmest wishes, when he shared the 1936 Nobel Prize for Physiology or Medicine with Otto Loewi (an honorary member). Loewi's reply to the Society's letter of congratulation recalled his debts to '*meiner grossen Lehrer*, E. H. Starling *und* W. M. Bayliss' and expressed his pleasure at sharing the award with '*mein lieber alter Freund*, Sir Henry Dale'.

The regular round of meetings was interrupted in late 1939 by the outbreak of war. The meetings successively scheduled for Guy's Hospital, the National Hospital, Queen Square, and the London School of Medicine for Women were cancelled, and at a meeting at the National Institute for Medical Research in Hampstead on 16 December 1939, the following report was passed:

During the period of hostilities, or until this rule is repealed by the Society, the Secretaries shall have power to arrange meetings at such times and at such places as appear to them to be the most convenient in the existing circumstances. They shall consult the head of the Department at which such meetings are to be held with regard to the conduct of the meeting. They shall act in the spirit of the foregoing domestic rules, and shall not be bound by the letter of these rules.

The War reduced the frequency with which meetings could be held, but this was partially compensated for by a more liberal use of two-day meetings like the one held in Cambridge on 18–19 December 1940. On that occasion E. D. Adrian as Chairman congratulated H. H. Dale on his election as President of the Royal Society. Adrian pointed out that there were three gentlemen then present who had simultaneously been members of the Society and Presidents of the Royal Society: Sir Charles Sherrington, Sir Frederick Gowland Hopkins and Sir Henry Dale. Since then, three other members of the Society – Adrian himself, H. G. Florey and A. L. Hodgkin – have been Presidents of the Royal Society.

Despite the War, meetings were still occasionally held in London, but even meetings outside the Capital were not exempt from the disruptions of the time. As the Secretaries grimly noted, a meeting scheduled for Oxford in July 1940 was cancelled due to 'local difficulties associated with the stress of conditions arising from a probable invasion of the country'. One planned for London in October of the same year 'was abandoned, as the battle of London was in progress, a battle that may well go down as one of the 16 decisive victories in the history of warfare'. Of four meetings scheduled for 1941, one was cancelled, but the Cambridge meeting for that year was enlivened with Sherrington's reminiscences of the Society's early days which were reproduced above.

During the first years of the War, much of the work in arranging meetings devolved on G. L. Brown, who had been appointed Assistant Secretary when both Secretaries, J. H. Gaddum and A. N. Drury, became involved in heavy war time duties. Brown became Secretary in 1942, when Gaddum resigned, but Brown's own busy schedule made it necessary to appoint another Assistant Secretary, W. H. Newton, in 1943. Shortly thereafter, Newton succeeded Drury as Secretary.

Although the War imposed hardships, it did not dampen the Society's *esprit*, as the minutes for the semi-annual meeting at St Thomas's Hospital, then at Godalming, make clear:

Sir Henry Dale thanked Professor McSwiney and his colleagues for the hospitality which the Society had enjoyed. This meeting, held as it was in the Sherrington School of Physiology, made an appropriate occasion for him to ask the Society to accept a small gift. He had in his possession the bronze figure of a dog, which had been modelled by the father of Rudolph Magnus of Utrecht* (see facing p. 23). The figure represented the dog carrying out the scratch reflex, and Magnus had consequently given it to Sir Charles Sherrington. The figure had for many years rested on the mantlepiece of his room in Oxford, and when he left Oxford, he had, with his

* This account of the origin of 'The Dog' was some years later corrected by Dale. It was modelled by an unknown sculptor and obtained by the father of Rudolph Magnus as a present for the son who had worked with Sherrington in Liverpool about 1908, where no doubt the scratch reflex was discussed and demonstrated.

characteristic generosity, given it to Sir Henry Dale. He had kept it as an honoured decoration of his room at the National Institute for Medical Research, but the time had come when, in his turn, he had to leave his laboratory. He therefore asked the Society to accept this gift that it might have before it a lasting reminder of Sherrington, the greatest figure in the history of the Society, and to a lesser extent of Magnus and of himself who owed so much to the inspiration of the Society.

The dog had been mounted on a plinth with a plate bearing the words:

'Rudolph Magnus gave me to Charles Sherrington, who gave me to Henry Dale, who gave me to the Physiological Society in October 1942.'

He hoped that the Society would accept it and that, on appropriate occasions, it might be placed before the Chairman of the meeting.

Professor R. A. Peters, in accepting the gift on behalf of the Society, hoped that it would be many years before they needed a memento of Sir Henry. His influence on the Society had been greater than many members realised and the high standard of the papers presented to the Society was a tribute to the example which Sir Henry himself had set so often.

Magnus' dog has since become a kind of Society mascot.

By late 1944 there was hope for better times, and at a meeting at the Middlesex Hospital the Society asked a guest, Professor Cordier, to take the following message to his fellow French-speaking physiologists:

By a resolution of the Physiological Society made at their meeting on November 25th, I am directed to convey to you the Society's most cordial greetings and to express its happiness at the renewal of free communication between us. Our friendship needs no renewal; for the past five years we have looked forward to the time when we could meet again (in freedom and comfort) to discuss our scientific work and enjoy the company of our colleagues. It is in the hope that such a time may be near at hand, that the Physiological Society assures you of its warmest regards.

At the Semi-Annual meeting at Oxford on 29 September 1945, so the minutes record, 'Several members were heard to remark that at last they felt that the War was over'. One reason for this remark was an item on the agenda, a memorandum on 'Printed communications and Procedure at Meetings'. The Committee recognized that,

During the war years restrictions on our research activity and difficulties of travel have tended to limit the numbers of papers presented, but a recrudescence of the old overloading of meetings is already in evidence, and the vitality of the Society makes its further development not only inevitable but welcome.

As a factor on the credit side, the war had taught members to appreciate the value of two-day meetings for its more important occasions, and this should help to lessen the strain of big programmes. It must, nevertheless, be pointed out that many members would welcome the holding of symposia or discussion meetings which might very properly occupy one of the days of a two-day meeting, but only at the expense of a heavy overloading of the remaining day.

Some relief of the load on Meetings will result from increasing their number to the pre-war figure of 9 per year and from the probable increase in their duration as the accommodation and catering facilities in the Medical Schools return to their pre-war standard. Members may even welcome an increase in the number of meetings above the pre-war level, but it will be administratively difficult, to hold them at intervals shorter than 4 weeks under the existing rules and probably undesirable to increase them beyond 10 per annum.

It can be seen from these few paragraphs of the precirculated Committee Memorandum that the contemporary meeting format had come into existence.

The end of War also meant the possibility of holding the International Physiological Congress, originally planned to meet in England in 1941. In 1946 a central organizing committee was set up. It consisted of E. D. Adrian, H. P. Gilding, H. H. Dale, A. V. Hill, E. G. T. Liddell, and G. L. Brown. The services of Captain E. W. Geidt were secured for handling the administrative details. The Society and the Royal Society both contributed towards the cost of the Congress, and UNESCO donated a sum to defray the expenses of Chinese visitors. At the urging of Liddell and of the Committee, H. H. Dale presided over the Congress, held in Oxford from 21 to 25 July 1947. The Society presented to some 1300 participants copies of Sherrington's *Integrative Action of the Nervous System*, first published in 1906 by Charles Scribner's Sons. It had been reprinted with a new preface by Sherrington, a chronological list of Sherrington's publications prepared by Samson Wright, and a *curriculum vitae* of the author by E. G. T. Liddell. This book, which has a fair claim as the most important physiological monograph of this century, was an appropriate memento for the Oxford Congress, for, had not the War postponed it for six years, Sherrington himself would have presided. Despite the free issue of the book to Congress participants, the Society made a small profit on the reprint, for the remaining 1700 copies were sold within a few months, and in 1948 the Yale University Press made a photolitho-offset of this edition to supply a continuing American demand.

By the late 1940s the worst of the post-war shortages were over, and members could again attend meetings without bringing along their ration books. Since then, no large external catastrophes have interrupted the regular schedule of meetings, which, as we have already seen, have been characterized by their increasing size and complexity.

The first of the post-war Society excursions to the Continent occurred in April 1951, when a joint meeting with the Belgian Physiological Society was held. Many of the arrangements in Liège were made by Z. M. Bacq, a Belgian physiologist who was elected to full Society membership in 1937. H. H. Dale voiced the Society's thanks at the meeting, which included a visit to the former palace of the Bishop Princes of Liège and an excursion into the surrounding countryside. Bacq's relationship with the Society has extended to the present, for his little history of the concept of chemical transmission of nerve impulses was distributed to the participants of the Dale Centennial Symposium at Cambridge in September 1975 (Bacq, 1975).

Shortly after the Belgian meeting, the Society celebrated its seventy-fifth anniversary with a two-day meeting at Oxford on 6–7 July 1951.

The Society's oldest member, Sir Charles Sherrington, was unable to attend, but a large number of members and representatives from societies abroad properly toasted the occasion, if the port-stained sheets of signatures of those present are indicative of the festivities.

The minutes of the meetings during the 1950s and 60s give the impression of an active, regular schedule. Secretarial asides were frequently concerned with rule infractions and crowded sessions. A paper in 1953 on the then novel intoxicant LSD elicited from the Secretary the comment that the drug

> in an oral dose of a few micrograms induces in about 20 minutes certain mescalin effects such as distortion of the bodily image and loss of interest in the surrounding. The latter of these actions was also produced even more rapidly in members of the Society by the five or six authors who *read* their papers.

In 1955 one Secretary reflected on the problems of amplifying the human voice in a large, crowded room:

> Last year's Mayors chair-type of microphone was this year replaced by a more fearsome model which gave the impression that the speakers were in a deadly embrace of a gigantic surrealist spider. As a gallup poll showed that communications were easily heard without the microphone, but that as discussions from the floor of the House were mostly inaudible, it might be advisable at a future institute meeting to leave speakers unencumbered and provide microphones for all the members of the audience.

On the other hand, at a particularly full session at the Middlesex Hospital late in 1955, Samson Wright, the Chairman, expressed his support for the Churchillian thesis that a crowded house gives a 'sense of occasion'. Mealtimes were even more crowded, with an attendance between 115% and 123% of those who had returned reservation forms.

The round of meetings at home was again broken when in July 1960 the Society met in Lund, Sweden, on the invitation of G. S. Kahlson. Contacts with foreign physiologists were also maintained through the various international congresses, for which the Society contributed travel grants to its members. In addition, the Foreign Secretary, A. L. Hodgkin, announced in 1962 that the Society was setting aside an annual sum to enable it to invite three guests from Europe each year to one of the Society's meetings.

The meeting at Mill Hill in November 1963 was enlivened by the announcement that the Nobel Prize had been awarded to three Society members, A. L. Hodgkin, A. F. Huxley, and J. C. Eccles. Hodgkin recalled that at school he had been made to play the hymns, two of which had particularly influenced him, 'Awake my soul, stretch every nerve', and 'Go forth life's noble prize to win'. Since it was traditional for many years to hold the November meeting at Mill Hill, it was also there that R. Granit's 1967 and B. Katz's 1970 Nobel Prizes were reported to the Society.

No less than 450 members and guests attended the Annual General Meeting at University College London, on 25–26 March 1966. Both the Physiology Theatre and the Pharmacology Theatre, to which the lecture was relayed, were filled for I. de Burgh Daly's delivery of the second Bayliss–Starling Lecture. During the course of the evening members had the opportunity of hearing all of Starling's successors in the Jodrell Chair of Physiology at U.C.L. – A. V. Hill, C. Lovatt Evans, G. L. Brown, and A. F. Huxley.

The past decade has had its share of memorable meetings, such as the one on 30 September 1966 in honour of A. V. Hill's 80th birthday; the meeting at Charing Cross Hospital in January 1968, which included dinner in the House of Lords; the Edinburgh meeting in July of the same year at which W. D. M. Paton delivered the Society's first Review Lecture; the joint meeting with the Association des Physiologistes in Paris, organized by an Honorary Member of the Society, Professor Alfred Fossard, in April 1971; or the Dale Centennial Symposium, sponsored jointly by the Society and the British Pharmacological Society in September 1975. These and other occasions like them furnish evidence of the Society's continuing vigour.

HONORARY MEMBERS

The Society has always had a category of honorary membership. Rule IV of the first set of Society Rules reads:

> Men of distinction in Science who have contributed to the Advancement of Physiology are eligible for election as *Honorary Members*. The number of Honorary Members shall not exceed five.

As the relevant rule now stands, 'men' has been changed to 'persons', the maximum number has been eliminated, and the proviso has been added that Committee shall nominate the candidates for Honorary membership.

According to the Society's first Secretary, George John Romanes, the category was originated as a way by which the founding members could express their admiration for, and solidarity with, the greatest of British biologists, Charles Darwin. As Romanes wrote to Darwin on 1 June 1876,

> I am sure the Physiological Society will be very pleased that you like being an hon. member, for it was on your account that honorary membership was instituted. At the committee meeting which was called to frame the constitution of the Society, the chairman (Dr Foster) ejaculated with reference to you – 'Let us pile on him all the honour we possibly can,' a sentiment which was heartily enough responded to by all present; but when it came to considering what form the expression of it was to take, it was found that a nascent society could do nothing further than make honorary members. Accordingly you were made an hon. member all by yourself; but later on it was thought, on the one hand, that you might feel lonely, and on the other that in a Physiological Society the most suitable companion for you was Dr Sharpey (Romanes, 1896, pp. 51–52).

Darwin and William Sharpey were thus the first two honorary members, and in their differing relationships to the Society they typify the two fundamental kinds of honorary members which are still elected.

Darwin was the distinguished outsider who would probably not have joined the Society as an ordinary member. His counterparts in a modern list of honorary members are the outstanding foreign life scientists who would be ineligible for ordinary membership because they live and work abroad, and in some cases, because their work is not in the strictest sense physiological. Examples of 'traditional' foreign physiologists who have been elected to honorary membership include W. B. Cannon, and D. D. Van Slyke of the United States, W. R. Hess of Switzerland, I. P. Pavlov of Russia, L. Fredericq and P. A. Nolf of Belgium, and C. Richet of France. Honorary members who have made significant contributions to the biological sciences but who would not conventionally be called physiologists include T. H. Morgan and F. Peyton Rous of the United States.

William Sharpey, on the other hand, was typical of the other kind of honorary member – distinguished members of the Society itself who are elected from within the ranks. Their names are of course familiar: E. Sharpey-Schafer, C. S. Sherrington, J. B. Leathes, H. H. Dale, C. Lovatt Evans, I. de B. Daly and E. B. Verney, among others.

Honorary membership thus serves a double function: as a means of establishing closer ties with a select group of eminent life scientists throughout the world, and as a way by which the Society can honour its own. The minute books of the Committee contain numerous letters from recipients of the honour which testify to the strength of the bond thereby created. In his own quaint manner, Darwin set the standard. Writing to Romanes on 29 May 1876, he said,

> I was very much gratified by the wholly unexpected honour of being elected one of the Honorary Members. This mark of sympathy has pleased me to a very high degree. [Darwin, 1888, vol. III, p. 204].

When informed by Romanes that the category had been created largely for him, Darwin replied, 'Your letter has made me as proud and conceited as ten peacocks' (Darwin, 1903, vol. II, p. 436).

Honorary members have all the rights of ordinary members except that of voting. In practice, the honour is reserved for individuals who have reached retirement age, though election does not itself disqualify them for continued active participation within the Society. There is at least one instance, however, of a member who felt, when first approached by the Committee, that he was not quite ready for honorary membership. H. H. Dale was first proposed in 1942; it was suggested in the Committee that he might not welcome the honour and the Secretary's delicate enquiries

confirmed this. Consequently he was not actually elected until 1951. On that latter occasion he broke precedent by being the first honorary member to be present at his own election. Always an individualist, he then asked permission to express his appreciation of the honour done to him by the Society. He realized, he said, that the time had now come for him to be placed on the shelf. He hoped, however, that the Society would dust him down occasionally and display him as a period piece. Physiology was changing rapidly; when he attended meetings he saw that many laboratories had become electronic labyrinths, and the time was approaching when the physiologist would sit in a corner, occasionally pressing a switch or languidly contemplating a differential equation. He had no doubt that such a worker might say to a junior colleague: 'Look, there's old Dale, he once used a kymograph.'

Dale's sixty-eight-year relationship with the Society was never an ordinary one.

The number of honorary members has always been small, as can be seen from Fig. 2. The twenty-six honorary members at the time of the Annual General Meeting of the Society's centennial year were as follows:

G. S. Adair	W. Feldberg
Lord Adrian	T. P. Feng
E. C. Amoroso	A. Fessard
H. Barcroft	R. Granit
C. H. Best	A. V. Hill
Dame Harriette Chick	Sir Hans Krebs
Sir John Eccles	Y. Kuno
R. A. McCance	W. A. H. Rushton
Sir John McMichael	H. H. Ussing
R. Margaria	Marthe Vogt
Sir Peter Medawar	U. S. von Euler
Sir Rudolph Peters	Sir Vincent Wigglesworth
Sir Frederick Russell	Y. Zotterman

JOURNAL OF PHYSIOLOGY

BACKGROUND TO THE SOCIETY'S ACQUISITION

The *Journal of Physiology* emerged from the same matrix of professional and scientific concerns that had stimulated the original foundation of the Society itself. Michael Foster was instrumental in both, founding the *Journal* in 1878. He had previously been one of the editors of the *Journal of Anatomy and Physiology* (started in 1866 and eventually becoming the *Journal of Anatomy*), but by the mid-1870s Foster believed that the interests of experimental physiology could no longer be adequately served

by a journal primarily devoted to morphology and functional anatomy. He wanted a journal which would be available to all English-speaking physiologists, as he made clear in his letter of 3 July 1877 to H. P. Bowditch, Professor of Physiology at Harvard University:

Dear Sir,

I have left the Journal of Anatomy and Physiology, with which I have been connected for the last two years – chiefly that I feel convinced that Morphology and Physiology are now so distinct subjects that a common journal will not do for the two.

I am now prepared to start a Journal devoted exclusively to Physiology (including, of course, Histology, Experimental Pathology, action of drugs etc.) if the following scheme could be carried out.

To have a single responsible editor – with co-operators in England and America so as to make the journal a common medium for English speaking physiologists. The co-operators to have no direct responsibility, pecuniary or otherwise, but to function as consultants in case of doubt or difficulty. I have put down the following as temporary.

Journal of Physiology
Edited
with the co-operation of

Prof. Burdon Sanderson	in London
Prof. Gamgee	in Manchester
Prof. Rutherford	in Edinburgh
Prof. J. Flint	in New York
Prof. Bowditch	in Boston
Prof. Martin	in Baltimore

Sanderson has agreed provisionally and so has Martin, about Rutherford I am very doubtful but Gamgee will I think join.

MacMillan would I feel sure be willing to publish and as he has a house in New York it might be published simultaneously (or a few days later) in London and New York.

I calculate that a circulation of 400 would float it, a circulation of 500 would make the thing comfortable. I should be very glad to hear from you whether you feel disposed to join such an undertaking.

Yours very truly
M. FOSTER

When the *Journal* first appeared the following year, Foster's editorial board included five of the six individuals mentioned in this tentative proposal to Bowditch, H. C. Wood of the University of Pennsylvania replacing J. Flint as the third American. This editorial board remained intact until Arthur Gamgee left after Volume 6 (1885). With the addition of R. H. Chittenden of Yale University in 1890, American editors outnumbered their British colleagues, though Foster of course remained in ultimate control. T. P. Anderson Stuart of Sydney and E. A. Schäfer (Sir Edward Sharpey-Schafer) were subsequently added to the editorial board before it was reconstituted in 1894, when John Newport Langley bought the

Journal and became joint editor with Foster. When the American Physiological Society established the *American Journal of Physiology* in 1898, Bowditch and Chittenden were among the original editors and American influence in the British-based *Journal* naturally waned (Howell, Greene & Meek, 1938). By 1902 only physiologists working in Britain or the Empire appeared on the *Journal* covers as aiding 'in the selection of papers for publication' (though Langley rarely if ever used his Editorial Board). Foster and Langley remained joint co-editors from Volume 16 (1894) until Foster's death in 1907, when Langley assumed the sole editorship until Volume 60 (1925). In fact, after Langley acquired the *Journal* late in 1893 he himself exercised more aggressive editorial and financial policies than had the genial Foster. By the time of Langley's death in November 1925 the *Journal* was financially secure; its scientific reputation had been sound from the very beginning. Given its long association with the Society it was natural that the proprietorship should be acquired by that organization. This seemed especially desirable since many members felt that Langley has excessively dominated the *Journal*, though after all it was his own property.

A special Committee of seventeen members acting on behalf of the Society began negotiations with Mrs Langley immediately after her husband's death. Details of acquisitions of journals by the Pathological Society and the Biochemical Society were obtained and, after discussion, H. E. Roaf wrote to Mrs Langley offering £1000 in four equal annual payments for the *Journal*. It was also quietly agreed that 'If this offer be not accepted, the Committee of the Society take immediate steps to institute a new Journal.' Although Mrs Langley's solicitor endeavoured to increase the purchase price substantially, the original offer was ultimately accepted. He wrote late in 1925:

> ...It was the wish of Professor Langley, and Mrs Langley is very desirous of furthering this wish, that the Journal should pass into the hands of the Society and consequently she feels that she has no choice but to accept the offer which the Society has made and she has authorised us to accept on her behalf the offer specified in the fourth Resolution adopted by the Society at their General Meeting held on 14th inst. [i.e. December 1925] with the addition that the first of the instalments becomes due on the 1st day of January next.

By 1 January 1926 the Society officially had its own journal.

FROM ACQUISITION TO THE WAR

The acquisition of the *Journal* has clearly been one of the most important episodes in the Society's history, but the new property had certain financial implications for the Society. Financial and editorial guidelines were laid down at a meeting of Committee on 23 January 1926. It recommended

that the Treasurer, Secretaries, and Chairman of Committee serve as Trustees, and that these Trustees should enquire into the possibility of incorporation so that individuals would no longer be personally liable for the *Journal* and other Society property. The *Journal's* Editorial Board was to consist of four Editors, one of whom was to be Chairman. Papers were to be submitted in the first instance to a named Editor, who was to be provided with clerical assistance. Expenses incurred in connexion with editorial meetings were to be paid by *Journal* funds. Editors were to have complete discretion regarding publication, and initially no more than two volumes of approximately 600 pages were to be published per annum.

The Trustees were the Treasurer, M. S. Pembrey, the two Secretaries A. V. Hill and H. E. Roaf, and the Chairman of Committee, E. H. Starling, replaced by H. H. Dale after Starling's death in 1927. They remained liable for the Society's finances until January 1937, when the Society was incorporated under the Companies Act, 1929 (see above).

The original Editorial Board consisted of E. D. Adrian, A. V. Hill, J. B. Leathes, and Sir Charles Sherrington (Chairman). The Board's first brief editorial report to the A.G.M. of 19 March 1927 has apparently not survived, but a longer report for the following March is worth quoting in full:

Report of the Editorial Board of the Journal of Physiology, 1927–1928

Presented to the Committee and to the Society, March 17th, 1928, at the Annual General Meeting and received by the Society to be recorded in its Minutes (by Sir Charles Sherrington).

The Board begs to report as follows:

During the year 1927–28 (*a*) Sir Edward Sharpey-Schafer's History of the Physiological Society was issued. A copy was presented to every member of the Society and 500 copies have been retained for issue to future members on their election. Several very favourable reviews have appeared and the number of copies sold up to date to external subscribers is 87.

(*b*) The copy of the Author Index for Vols 1–60 has been completed and is now in the Press. This will be issued in about two months. Members of the Society can obtain it at the reduced price of 12/6d. 128 copies have been ordered already by members and 202 copies by external subscribers.

(*c*) The financial position of the Journal is good. The cost of Index and History has still to be met and the last instalment of the purchase price has to be paid, but the Board considers it possible immediately to reduce to one half the cost of extra reprints supplied to authors, and in the near future to increase the size of the volume to 480 pages and to print plates, if and when required, on art paper.

(*d*) The Board wishes to bring to the notice of the Society the very great advantage which in their opinion accrues both to the Society and to physiology in general from the Society's ownership of the Journal. The indiscriminate publication in Germany of papers on physiology and biochemistry, and the very heavy expense of these journals, are largely due, in their opinion, to the fact that these journals are owned and controlled by publishers and not by the scientific societies themselves. The

matter of publication is one of extreme importance for the future of science, and if a real control of the German journals were exercised by the German physiologists and biochemists themselves the deplorable fact would no longer exist that the German journals covering these two subjects cost at present per annum more than the publications of all the rest of the world put together. In this country, owing to the activities of the Royal Society, the Physiological Society and the Biochemical Society, practically all publication is controlled by disinterested agencies employing an independent editorial board and a system of referees, whereby diffuseness in writing is checked, advice is given to authors in the preparation of their papers, and work obviously unfit for publication is refused. The work of editing a journal fairly and properly is a difficult one, but it has been lightened in the case of the Journal of Physiology by the readiness of members of the Society on all occasions to assist the editors by acting as referees. Whatever may be the success of their own particular efforts, the Editors feel that the Society is to be congratulated on the possession of an organ of publication with as high traditions and in as satisfactory a financial position as the Journal of Physiology.

It can be seen from this report that the Board quickly established certain editorial policies which succeeding Boards still follow. The Editors properly drew attention to the value of Society ownership in maintaining high standards. In 1931 they were to point to a specific abuse which accompanied the *laissez faire* world of German scientific periodicals, as they unwittingly accepted and published a paper which was merely a translation of work which appeared almost simultaneously in *Pflügers Archiv*. This problem is now avoided by requiring each author to state explicitly that the paper is not being considered for publication in any other journal. The practice of calling on individual members for aid in refereeing papers has continued, though the size of the Editorial Board itself has of course gradually increased. The separate index for Volumes 1–60 was also a Society innovation which has lasted. J. G. Priestley prepared the index for the first sixty volumes, but for many years Dr Grace Eggleton was responsible for the successive cumulative indexes. In 1928 the convention (still practised) of listing authors of multiple-author papers alphabetically was begun. The *Journal* is one of very few scientific periodicals left which still retains this custom. It had particular advantages when it was instituted in the 1920s, though its appositeness in more recent years is a topic of continuing debate in the Society.

Sherrington served as Chairman of the Editorial Board through Volume 83 (1935). The appearance of twenty-three volumes in nine years obviously gives the lie to the early plan of a maximum of two volumes per year. This expansion first to three and then to four volumes per year was possible through the high scientific standards which obtained under the distinguished Board. But with growth came additional work, and after five years the Board was increased from four to six members by the addition of J. G. Priestley and I. de B. Daly. L. E. Bayliss joined the Board in 1935, though Daly had already left the previous year. Sherrington

was the first of the original Board to retire. His fellow Editors expressed their admiration for their Chairman in no uncertain terms in a letter sent to Sherrington on the occasion:

The impending resignation of Sir Charles Sherrington after nine years' service calls for special and respectful mention. There are few advantages and many disadvantages in being the editor of a journal; but in the case of the Journal of Physiology all the disadvantages have been outweighed by the privilege of working with and under the Chairmanship of one so wise and so sympathetic. If they could, the editors would have prevented, as they did for a time, Sir Charles' resignation; but they appreciate, while they regret, his desire for relief from responsibility, and they wish to put on formal record not only their feelings of affection and esteem but their high appreciation of the services he has rendered to physiology and to the Physiological Society by the work he has done for scientific publication in general and for the Journal of Physiology in particular. Such success as the Journal has had is due largely to its Chairman's guidance and the Physiological Society is deeply in his debt.

Leathes replaced him as Chairman in 1935 and part of 1936. Adrian briefly stepped in as acting Chairman, but by the end of 1936 Adrian, Hill and Leathes had all left the Board. E. B. Verney then became Chairman, serving in that capacity through 1944. That three out of the four original Editors were or became Nobel Laureates must be a record which no journal anywhere could match.

The Editorial Reports during those years testify to the care which the Editors devoted to maintaining the scientific and stylistic excellence of the *Journal*. The 1930 Report lamented:

The Editors desire to call the attention of the Society to the fact that many papers are submitted in a state obviously *unfit for publication*. They do not consider it to be their duty to correct elementary errors in grammar, spelling, arithmetic, or references, or to amend typewritten matter which should have been revised before submission. The instructions to contributors *re* references, figures, etc., are often ignored....

The Editors feel that the enormous mass of scientific literature, and the poor quality of much of it, now constitute a real hindrance to scientific progress and development. The difficulty of following more than one branch of a complex subject like physiology is apparent. Already many libraries and laboratories are unable to purchase much of the material published. By the aid of an adequate system of cataloguing papers, one factor in the problem can be dealt with. The more difficult factor is that concerned with the mass and quality of the publications themselves.

In 1933 the Editors returned to this relationship between quality and quantity in scientific output:

Three volumes and one part were published, amounting to 1680 pages. In the same period the American Journal of Physiology published 2582 pages, viz. 1·54 times as much; Pflügers Archiv published 2166 pages, viz. 1·29 times as much. The Editors hope that the Society will approve of their moderation, and will agree that the scientific value – as distinguished from the bulk of the papers published is represented inversely by these figures.

If the Journal of Physiology, the Quarterly Journal of Experimental Physiology and the Proceedings of the Royal Society be taken together, 2770 pp. of physiological papers were published in Great Britain; taking the American Journal of Physiology and the Journal of Cellular and Comparative Physiology together, 3440 pages were published in the United States; taking Pflügers Archiv, the Zeitschrift f. Biologie and Arbeitsphysiologie together, 3782 pages were published in Germany. The ratio is British 1: American 1·24: German 1·36.

In abstracting journals and in biochemical journals a greater contrast exists. Physiological Abstracts in 1931–32 was 801 pages and Nutrition Abstracts 890 pages, a total of 1691 pages; Berichte über die gesammte Physiologie was 5731 pages, a ratio of 3·4 to 1 in favour (one might rather say in disfavour) of Germany. In 1931 the Biochemical Journal published 1978 pages, the Journal of Biological Chemistry 3279 pages, Hoppe-Seylers Zeitschrift 2208 pages, and the Biochemische Zeitschrift 6490 pages, a total of 9148 pages to Germany. The ratios are British 1, American 1·6, Germany 4·6.

In other subjects the ratios are even more astonishing. The Library of the College of Physicians and Surgeons of Columbia University estimated that in 1930–31 of the total cost of the journals to which they subscribed 9 p.c. was British, 13 p.c. American and 71 p.c. German. It is evident that the German contribution to science has been spread out rather thin.

During 1932 J. G. Priestley had prepared a pamphlet of 'Directions to Authors', and the 1933 Report noted that some improvement in presentation had resulted: 'Even hardened offenders have recently sent in papers respectfully prepared.' In keeping with the spirit of the times, later editions of this pamphlet have been called 'Suggestions to Authors.'

Two additional themes recur in the Editorial Reports in the years before the War. The first concerned the perennial issue of the lag between submission of papers and their publication. This is dependent on a number of factors, including the relationship between the rate of submission and the rate of publication; the size of the backlog of accepted papers; the speed with which editors and referees make decisions; the time it takes to get papers copy-edited, set in proof, and corrected; and the frequency of publication. One key element is of course the printer and publisher. Foster had used Macmillans for only two volumes, and long before the Society acquired the *Journal* the Cambridge University Press had become first the printers, and subsequently both the printers and publishers. Alternative arrangements have been explored on various occasions during the past fifty years, but nothing has been found sufficiently attractive to prompt the Society to terminate its relationship with the C.U.P. One obvious possibility would be for the Society to publish the *Journal* itself, as the Biochemical Society publishes the *Biochemical Journal*. However, such a step would necessitate a considerable centralization of administrative and technical manpower, and the Society has hitherto resisted the degree of centralization thereby implied.

At the A.G.M. in 1938 the Board called attention to the improvement in publication delay which had been effected during 1937:

> At the last Annual General Meeting, the Board, in regretting the long interval which then elapsed between the receipt of a paper and its publication in the Journal, expressed the view that the delay was due mainly to the fact that numbers were not being published in accordance with a definite time-table. Arrangements have therefore been made with the Press to publish the Journal on the 14th of each month, and these have been in operation since June of last year. The result has been a remarkable diminution in delay. It may be of interest to members of the Society to compare the average delay in publication of manuscripts submitted to a few contemporary scientific journals. The figures are as follows:
>
> Letters to Nature 35 days
> Pflüger's Archiv 67 days
> Biochemical Journal 67 days
> J. of Physiology (last 3 months) 80 days
> Proc. Roy. Soc. B 107 days
> J. of Physiol. (Jan–March 1937) 150 days
> American J. of Physiology 160 days
>
> It will be observed that we are now moving in this regard at double the speed of our American colleagues. With papers published in the Journal of Physiology during the first 3 months of 1937, the interval between the receipt by the central office of those papers which required merely editorial treatment, and their publication, was 130 days, while the corresponding figure for last December, January and February, is 80 days. The Board views the rapidity of this decline with a certain uneasiness since extrapolation suggests that in March 1939 papers will be published 7 days before the receipt of the manuscripts by the central office. The Board proposes, however, to guard against this contingency by facilitating at appropriate time and in suitable degree a central inhibitory state.

Since the corresponding figure for 1975 was 9·5 months, it is obvious that the 'central inhibitory state' has been rather too effective.

A second recurrent issue concerned the submitted papers themselves. From the very beginning Foster had had a genuinely international journal. Although the editorial control had been concentrated in Britain before the Society took over the *Journal*, there had never been nationalistic or other formal barriers to publication (except that English was the required language). These policies were continued under the Society and papers from abroad and from non-members have regularly appeared alongside of papers written by Society members. Selection has always been based on individual merit. Nevertheless, papers of British origin have naturally dominated. Following the Nazi rise to power, more Continental physiologists chose to publish in the *Journal* and this, combined with the world-wide economic depression of the early 1930s, created some anxiety among the Editors. However, their fears that *Journal* sales might seriously decline were not realized, and with the expansion to between three and four volumes per year which had occurred in 1931, the increased sub-

mission rate could be handled. The number of papers submitted rose from 113 in 1928 to 138 in 1933. It peaked in the pre-war years at 162 in 1938, declining to 112 in 1939. Throughout that period the rejection rate averaged about 20%, though there were of course yearly variations. Since the War the rejection rate has been considerably higher, averaging around 33%.

THE WAR YEARS AND AFTERMATH

The outbreak of War forced the Board to make several decisions. In 1932 the Society had purchased from Mrs Langley the copyright and remaining stocks of the first sixty volumes of the *Journal*, and efforts had been made to keep runs of back issues from 1914 in print, so that libraries could obtain them. With the threat of paper shortages, the planned reprinting of several back issues had to be abandoned in favour of a separate subject and author index for Volumes 61–100. In fact, Volume 100 appeared rather later than had been anticipated, since publication of the *Journal* was disrupted. Twelve issues had come out in 1938, but the issue scheduled for October 1939 was delayed because early War conditions made return of proofs slower. From eleven issues in 1939, publication dropped to six per year in 1940–1941. In 1942, 1943, and 1944, the figure had dropped to four each year, and only three issues appeared in 1945.

Before the War there had been separate distributing and press editors in London and Cambridge respectively. The War made the removal of the *Journal* office from University College London to Cambridge desirable, a move to which the 1940 Editorial Report referred in announcing the death of the man who had shouldered most of that responsibility:

> The Society will have heard of the immense loss which they and the Editorial Board in particular have suffered by the death, not ten days ago, of R. J. Lythgoe. Lythgoe's work on the Board was especially onerous, as in addition to the refereeing of papers in his particular field, he was in charge of the central office in London and more recently in Cambridge and in this capacity he has performed efficiently and with persistent firmness, tact and good will, a work which in its very nature demands rare gifts for its successful accomplishment.

Stocks of the *Journal* were also distributed between London and Cambridge since war-time insurance was prohibitively expensive. Even the relatively simple procedure of sending reprints became more difficult and the Editors commented in their Report for 1939:

> Members of the Society will be aware that an export licence is now necessary before printed matter can be sent to certain countries. In order that members may send reprints abroad should they so desire, arrangements have been made with the Cambridge Press whereby authors can send a list of names of foreign colleagues to the Press who will then undertake to post the reprints under their export licence.

The composition of the Editorial Board varied considerably during the War years. E. B. Verney continued as Chairman until 1944. E. G. T.

Liddell and F. R. Winton had come on to the Board shortly before the War, and H. S. Raper joined in 1940. G. L. Brown (who succeeded Verney as Chairman) and E. N. Willmer followed within the next two years, and with the addition of R. C. Garry, G. S. Adair, and R. A. Peters in 1943 and 1944 the Board had undergone a complete turnover between 1939 and 1945.

With many physiologists and associated personnel directly involved in the war effort, with research conditions difficult, the teaching duties of remaining staff increased, and a marked diminution of papers submitted from abroad, the less frequent appearance of the *Journal* mirrored the redirection of human and institutional resources into other channels. In addition, some research was secret and hence unavailable to the *Journal*. Nevertheless, a number of outstanding papers appeared in the *Journal* during the war years, and the Board continued its effort to maintain quality. The Editors noted in their 1943 Report:

> Some few years ago the Board invited authors to give more attention to the presentation of their work. Some of this advice seems to have fallen on stony ground, other among thorns, since during the past year papers have been received in a condition which can only be described as shocking. Indeed, it would almost appear that some authors failed to give close study to the printed directions; and the Board, with characteristic insight, have come to the regrettable conclusion that some of the copies have been lost or ingenuously committed to salvage...
>
> The Board regret that occasionally acknowledgement of a paper is interpreted as acceptance. This was particularly unfortunate in a recent instance in which the manuscript was accompanied by newspaper cuttings and other supporting documents designed to demonstrate the soundness of the author's political creed, and including a letter to a member of the Upper House, which the Chairman of the Board was requested to read and to forward. The noble Lord was asked to keep a sharp eye on Otto Habsburg of Austria as there could be no question that Otto was busy arranging a prelude to World War III. In his reply the Chairman acknowledged the receipt of the manuscript, and pointed out that he was enclosing the other memoranda, seeing that the Board was not an agency for the distribution of political documents and could not undertake any responsibility in connexion with requests of that nature. This evidently created an attitude of serene optimism, and the Chairman was somewhat surprised and embarrassed to receive a letter beginning: 'I got your kind letter yesterday...one could almost hear a heavy weight drop from my heart. Please could you print as many reprints of the publication as your paper supply allows (?300).' It will be of interest to know whether the author's confidence becomes infected by the lambent cast of doubt when the returning parcel is found to contain the manuscript and not the reprints.

The political theme had already been raised in the 1941 Report;

> Papers are occasionally submitted with covering letters in which highly original remarks are made about the governing classes of certain European countries, and the Board wish to assure the Society that such originality has not been allowed to compensate for lack of originality in the work itself. Neither is the Board impressed with supporting Christmas cards or other tokens of good-will sent to the Chairman in his capacity as an officer of the Society.

On the other hand the Editors did not fail to amuse the Society members at their own (the Editors') expense, as in the Report for 1943:

> The Board, on the other hand, have not enjoyed a year entirely free from criticism. In a recently published paper the vital capacity of a member of one of the Northern Universities is given as 3·833 c.c. (average of 6 determinations); and a senior graduate has expressed to the Board his concern lest this should be a true estimate of the present pulmonary attainments of members of his old University. Enquiry has shown that there is no cause for alarm amongst the members of this particular University nor for pride amongst the members of other Universities, the figure having been found to be inaccurate and the error traced to an oversight on the part of the Press Editor in checking the page proofs. The Chairman has interviewed the editor concerned, and he has promised never to do it again.

Two years earlier they had called attention to the fallibility of their referee system:

> Curious situations occasionally arise in the interplay between referees' judgements. One paper was considered completely unintelligible by the Board and the advice of a referee was sought. After much labour which entailed the rewriting of many paragraphs, the paper was returned to the office with the request that another referee should see it before it was passed to the press. So a second opinion was sought, and in his report the second referee had the misfortune to select as unintelligible the very paragraphs to the rewriting of which the first referee had devoted so much time and labour.

Such touches undoubtedly occasioned light relief from the difficulties and frustrations which the War inevitably imposed. But, as the Editors congratulated themselves in their 1940 Report, at least the War-time Board of Censors had not further complicated matters:

> No difficulties have so far arisen between the Editorial Board and H.M. Board of Censors; and the Editors regard the acceptance of their guarantee that a paper entitled 'The electric organ of the torpedo' contained no matter which might be used by the enemy towards a more effective prosecution of its naval warfare, as a telling symbol of mutual confidence and understanding.

Perhaps the Censor would have been more concerned had he noticed that one of the authors of this particular paper (W. Feldberg) was born in Hamburg.

The end of fighting in 1945 did not of course bring an immediate return to normal, and not until 1949 did the *Journal* reach pre-War levels of publication. Paper shortages, rationing, and general destruction during the bombing hindered the process of settling back into earlier routines. Indeed one of the Editors, E. N. Willmer, who presented the Report in 1948 suggested that anyone exceeding the current average length of eleven pages per paper was behaving antisocially. However, some sense of the desire for better times can be observed in 1949, when the Board came under criticism for the continuing delays in publication. One modification which emerged from the Board's discussions with the C.U.P. was the

appointment of a publications assistant. The War-time centralization of *Journal* offices in Cambridge was also reversed with the appointment, in early 1951, of Grace Eggleton in London as Distributing Editor, Andrew Huxley in Cambridge serving as Press Editor. This arrangement, with separate Distributing and Press Editors, has been maintained to the present.

THE PAST TWENTY-FIVE YEARS

The most striking feature of the more recent history of the *Journal* has been growth. This phenomenon can be seen in almost any parameter one chooses to follow: papers submitted, papers printed, size of editorial board, circulation, and cost. Figs. 3–5 document some of these parameters in convenient form.

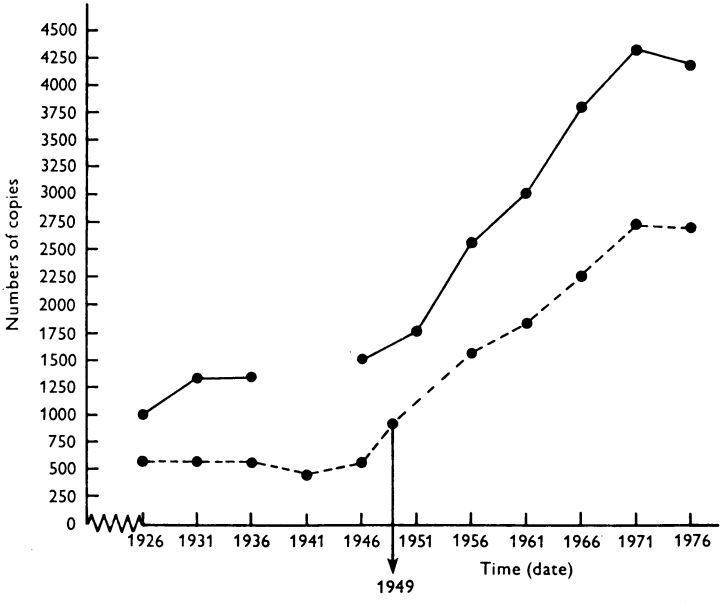

Fig. 3. *Journal of Physiology* 1926–1976: numbers printed and numbers of subscribers. Numbers printed, ——; number of subscribers, – – –. (Data taken largely from Editorial Reports at A.G.M. which refer to previous calendar year, e.g. 1976 figures refer to last volume for 1975.)

Fig. 3 shows the parallel increase in the copies of each issue printed, and the subscription. The difference between the two lines is largely taken up by the distribution to Society members, though of course a certain number of each issue are kept for stock. However, subscription figures have fluctuated more dramatically than membership, and during the War

external subscriptions to the *Journal* dipped below 500 for the only time during the Society's ownership. Subscriptions reached a low of 436 in 1944, though the recovery after the War was dramatic, and by 1947 subscriptions had climbed to a level (867) never previously achieved in the *Journal*'s history. Subscriptions continued to increase steadily during the 1950s and 60s, but the plateau during the past few years is undoubtedly significant since rapidly rising costs make large-scale increases in subscription unlikely.

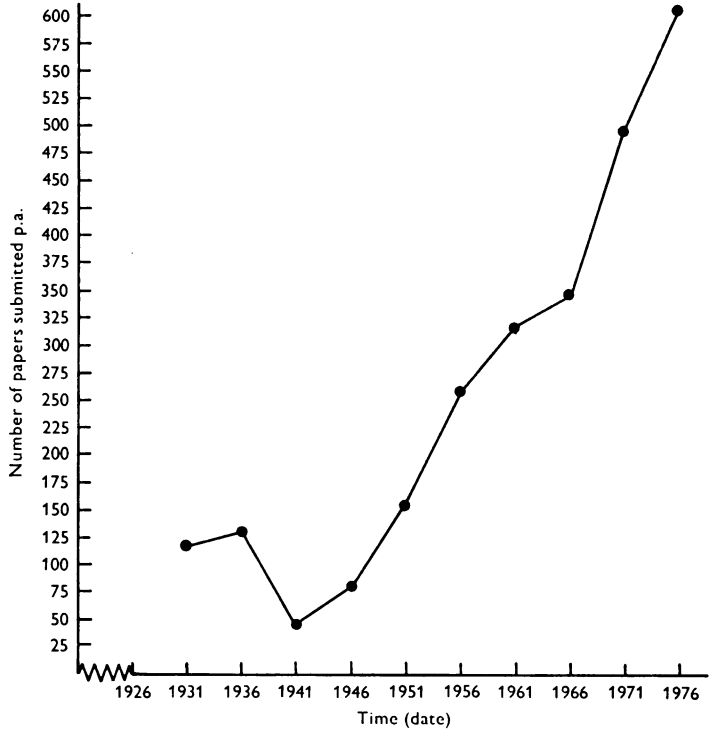

Fig. 4. *Journal of Physiology* 1926–1976: papers submitted p.a.

Fig. 4 charts the number of papers submitted to the *Journal* per annum. The disruption caused by the War can be clearly seen, as can the phenomenal expansion during the past two decades. This expansion has necessitated an increase in the size of the Editorial Board, which is shown in Fig. 5. This figure also indicates the average number of papers which each member of the Editorial Board could be expected to deal with. In practice, of course, the burden is never evenly distributed, and the Distributing Editor in particular is faced with an enormous task, as papers come in at the average rate of about twelve per week.

Despite the complexities associated with this increased scale of *Journal* operations, the editorial and administrative framework has changed very little. Instead of four, some thirty Editors now constitute the Editorial Board, but they are still unpaid members of the Society, who edit the *Journal* on behalf of the Society. Society members still routinely act as referees, and the Board still reports each year to the Society at the Annual General Meeting.

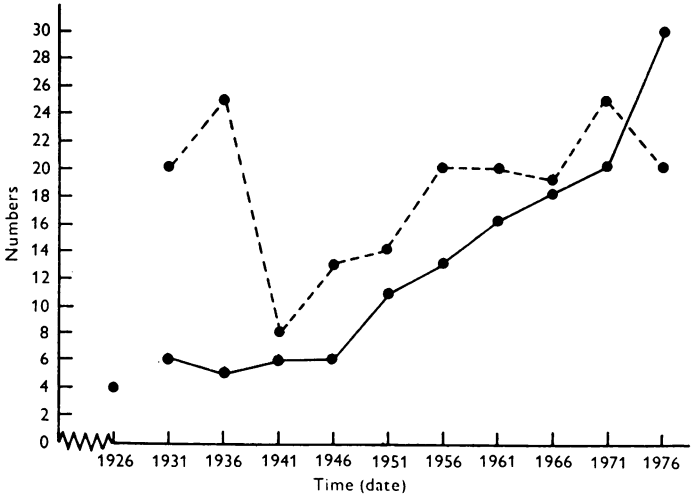

Fig. 5. *Journal of Physiology* 1926–1976: numbers of editors and number of papers per editor p.a. Numbers of editors, ——; average number of papers per editor p.a., – – – – –.

It is obvious, however, that growth cannot continue indefinitely. In 1975 the *Journal* was published in thirty issues, which constituted ten volumes. Without professional, full-time editors, this must represent something like a maximum rate of production. Nor does it appear likely that an Editorial Board of more than thirty can be expected to meet regularly or operate with the necessary degree of unity and cohesion. The significant inflationary rate in Britain during the past few years has also imposed practical limits on the expansion of the *Journal*. Increased costs of production have recently obligated the Society to raise the price of the *Journal* from £7 per volume in 1974 to its 1976 price of £15 per volume. Since the number of volumes published per year increased from eight to ten during this period, yearly subscription has gone up from £56 in 1974 to £150 in 1976. This steep rise has already resulted in a modest diminution in the number of subscribers, and further rises would seriously risk a more substantial rise in cancellations.

Despite the more frequent appearance of the *Journal*, the delay in publication has not been diminished. We have already noted that the Board was concerned with this issue in 1938, though their figure for speed of publication has not been matched since the War. Through the 1950s and 60s median publication time averaged about 7 months; in 1975 it was 9·5 months, though the Editorial Board agreed that this was not acceptable. The rejection rate for papers has slowly risen from roughly 20 % before the War to a fairly steady figure of about 33 % over the past decade. If the rate of submission continues to rise in future, the rejection rate may also go up, since it would be difficult to increase production above its present level.

With an annual subscription rate of £150, and more than 2700 subscribers, the *Journal* has a yearly turnover now approaching £500,000. This sum has of course increased dramatically over the past three years. From a much smaller base, the *Journal* has produced a net Society income in most years, though during the War it operated at a slight loss. Profits from the *Journal* are used to support the operation of the Society; membership subscriptions make up only about one quarter of the cost to the Society for each ordinary member. Additional profits over the years have been distributed between a reserve fund for the *Journal* and the Society's own reserves. The desirability of making a large profit from the *Journal* has been questioned by various members. Unfortunately, inflation has now made the question academic. The Society aims at a narrow profit margin of about 5 per cent on the *Journal*. Total Society reserves are now considerably less than half the yearly turnover of the *Journal*. Without the buffer of a planned profit a slight miscalculation in costs and income could spell disaster for the *Journal* and the Society.

Despite the difficulties imposed by growth and by the economic conditions of the 1970s the *Journal* remains the personal organ of the Society. At the same time, it is an international periodical of major importance. Two-thirds of the papers submitted to the *Journal* in 1975 came from abroad, a fact which attests to its unrivalled position among world physiological journals.

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