

Chapter 1

1947–1949

The founding years

International contacts among the few EEG workers had hardly begun before the Second World War put a virtual stop to them. They began to be made again when the war ended and by 1947 it seemed possible to arrange an international gathering. The driving force was W. Grey Walter, assisted by Denis Hill, George Dawson, Geoffrey Parr and others, acting through The (British) EEG Society, which was already some 5 years old.

1. The founding meeting in 1947

The meeting took place in the National Hospital for Nervous Diseases in Queen Square, London, UK on July 14–16, under the chairmanship of Prof. Edgar D. Adrian, the President of The EEG Society.

He delivered the following opening address to the assembled clinical neurophysiologists:

“In opening the first International Congress of Electroencephalography I wish to express on behalf of the EEG Society our great appreciation of the position we have been allowed to assume. Wherever the Congress had been held it would have been a pleasure to meet our colleagues from other countries to compare notes, to renew old friendships and make new ones; but in allowing us to act as hosts our colleagues have given us an extra pleasure which we appreciate very highly. So that in greeting those who have come from abroad I must extend not only the warmest welcome from the British Society but also their sincere thanks for the honour of your visit.

We are proud of our position as hosts and we appreciate also the responsibilities it brings – responsibilities which cause us some uneasiness.

We should have liked to welcome you to a nice clean city with all the comforts of modern civilization. Unfortunately, modern civilization has not quite the comfort of civilization seven years ago. We are conscious of our shabby streets, our buildings which need a coat of paint, our antique railway stations and our meals which recall the poem on Nebuchadnezzar when he lived on grass and said as he munched the unaccustomed food: “it may be wholesome but it is not good”.

But I must not emphasize the difficulties we feel in entertaining you properly, for these material shortcomings are almost worldwide and we have no right to make ourselves out as worse off than any other country, when we have suffered so little in comparison with much of Europe. Because our scars are visible on the surface we must not pretend that they are deeper than yours.

However, the difficulties with which we have all been faced may make us all the more gratified that this new branch of medical science has progressed so well. It was an adolescent before the war, not quite certain of itself or of its reception by its elders and certainly not ready for a full fledged international Congress. It has grown up in the period of intense strain and inadequate material of the past seven years. It has been helped, I think – certainly helped in this country – by the transference of interest from the sick civilian to the relatively healthy member of the armed forces. There have been greater opportunities for control, for the comparison of different temperaments, for investigating head injuries and so on. And the result has been that the science has grown up to a much better realisation of its position.

Some of the dreams of the adolescent have been abandoned: the EEG is not the sure guide to the state of the brain that we may have hoped it would become, but we now know far better what it can

show and what it cannot and the physician and surgeon have far better reason to trust the advice you can give them. I say you and not we, for I have to confess to an almost complete lack of first-hand acquaintance with the clinical uses of the EEG. To the physiologist like myself it is still a fascinating manifestation of something going on in the brain, but naturally the war years have not brought a corresponding advance on the academic side and it cannot be said that we have a very clear idea of what we are recording, where it comes from or what part these electrical oscillations play in the brain mechanism generally.

It is a satisfactory state for the physiologist to have such a problem, such obvious phenomena waiting to be fitted into the picture, just as it is satisfactory to the clinical scientist to have a record which he can correlate with cerebral abnormalities; but naturally the position is only satisfactory as a transient stage. I suppose I am one of the few people here old enough to have seen the introduction of the electrocardiogram into medicine. The recording of the human heart currents seemed at first little more than a technical tour de force, and we thought of Einthoven as the designer of a remarkable galvanometer and not much more. It was not until he and Thomas Lewis had established the physiological analysis that the pathological changes in the electrocardiogram became of such importance to the heart specialist, and then they became of such importance that he was in danger of neglecting everything else. I do not think the electroencephalogram is ever in danger of becoming too exclusive a guide to the neurologist or the psychiatrist – he has so many more symptoms to deal with than shortness of breath and anginal pain – but we cannot go wrong in trying to develop the full possibilities of the EEG and we cannot do this without a clear understanding of what we are measuring, without the analytical approach which Thomas Lewis brought to bear on the electrocardiogram.

Perhaps I speak too much as a physiologist, but our programme for this meeting shows that we are all fully aware of the need for this kind of approach. It is a programme full of important communications on the physiological, just as much as on the clinical, side and the sooner we get down to it the better. But as I have the floor for an unspecified time, I cannot refrain from abusing my position by showing you two slides from a recent experiment which seem to me to make a rather pretty commentary on the records

we make from our heads. This one looks familiar enough: there is a series of large potential waves at 12 c/s (Hz), stopped by a short period of sensory stimulation and building up again when the stimulus is over. It might be a record of the alpha rhythm when the eyes are opened and shut, but in fact it comes from the olfactory bulb of the rabbit and the pause coincides with the drawing of air through the nose and the consequent olfactory stimulation. The rabbit was under Nembutal and so the tendency to synchronised activity is probably exaggerated, but it is interesting to find the electrical behaviour of the human cerebrum echoed by the simpler mechanism of the olfactory bulb – as, in fact, it is echoed by such remotely related nerve cell systems as that in the optic ganglion of the water beetle.

But the slide comes from the end of a record after the olfactory stimulus had been withdrawn. Some residue of the smell is still about, but the sensory discharge at inspiration cannot be seen, though it is enough to break up the resting beat of the nerve cells. Here is the full record. To begin with the olfactory bulb is quiet. At the signal the nose is exposed to the smell of amylacetate, a fairly strong olfactory stimulus, and at the first inspiration there is an immediate response consisting of a fairly regular discharge at a high frequency (40 c/s or so). This activity arouses the olfactory bulb and the slow, large waves begin to appear in the intervals between inspiration, but they are broken up by each period of sensory activity. At first these periods are shown by the high frequency synchronised waves; later, as the stimulus grows less intense, there is an irregular activity with occasional large waves and later still the only sign of the olfactory stimulation is the breakdown of the slow resting rhythm. In the end that rhythm fades away and the bulb quiets down again – to remain quiescent till it is woken up by a fresh olfactory stimulus.

Although the conditions are abnormal, with an anaesthetic which favours synchronised activity, I think this gives a good picture of the effects of an afferent excitation on a mass of nerve cells which can work independently or in unison. There is the synchronisation at a high rate under an intense stimulus, at a low rate under none at all, and the failure of synchronisation when the stimulus is of the strength to cause differential activity. It illustrates some of the ways in which the alpha rhythm may be influenced, though it does not exhaust the possibilities.

Well, I must not take up your time with records which illustrate my own particular interest, for Prof. Bremer has already shown much the same thing in his records from the auditory cortex. I have only introduced these to emphasise the fact that the analysis of the electroencephalogram must lead us in one direction to the fundamental properties of collections of neurons, though it leads in the other direction to the highly specific patterns of activity in the human brain.

There is one more thing to add and I take the opportunity of adding it both as chairman of today's meeting and because I am on the verge of retiring from the presidency of the British Society. It is to express the deepest regret of all of us, and I am sure I speak for every country, the deepest regret that we have not been able to hold our first congress under the presidency of Hans Berger, the discoverer of the human electroencephalogram. In the early days I tried, rather unwisely, to perpetuate his name by calling his alpha rhythm the Berger Rhythm, but he would have none of it – and it was not a very good idea because in fact he had discovered the beta rhythm too. But his remarkable pioneering work needs no such advertisement nowadays. Our meeting is the direct consequence of it. Several of the new results which will be announced in our communications would probably be found anticipated in his papers if we read them carefully enough, for with far less adequate instruments and no encouragement at all he mapped out the whole territory which we have to cover.”

Naturally, the majority of those present were British but 16 other countries were represented at least once among the hundred-odd participants. Subsequent recognition that it was the first of an ever-growing series has led to its being called the First International Congress though at the time modesty or prudence allowed its organizers to claim no grander title than Meeting.

However, the third item on the first morning's program was a discussion on the “Formation of a World EEG Organization and the Foundation of an International Journal”, opened by W.T. Liberson of Hartford, CT, USA. Speaking of the proposed Journal he said it “should not be concerned exclusively with electroencephalography, but be devoted to all the problems of

experimental and clinical neurophysiology ... many of us do not commit ourselves to the problems of the electrical activity of the brain alone, but carry on research in the fields of electromyography, electrodermography and electrodiagnosis of peripheral nervous diseases”. Unfortunately, this liberal advice was to be ignored in the early days of the Federation.

The recent war was still very much in mind and Liberson said “There is no problem more significant in its implications for peace, for international solidarity, for cultural co-operation, than the study of the brain”. Herbert Jasper, while in general agreement, thought that “The hope that studies of the electrical activity of the brain alone will yield much towards this end seems naive and visionary”. Rather surprisingly, he also stated that “The formation of a World EEG Organization ... does not seem to me to be a practical or desirable undertaking at the present time”.

Denis Hill also was opposed to the idea of an international body, partly on the grounds of impracticality but also because it “would tend to separate our studies from the main stream of physiology on the one hand and to make the results of those studies less available to medicine and surgery on the other”.

H. Fischgold and Helge Hertz, while supporting some international cooperation, thought Liberson's proposals too ambitious; Moruzzi, however, was in favour of them. All three reported the imminent or completed foundation of EEG societies in their respective countries: France, Denmark and Italy.

Regarding the Journal, Jasper stated that it was something “which we can do in the very near future”, while Hill was consistent in not wishing to see the best papers hidden from the general view in a specialist journal. If other speakers expressed opinions, as they no doubt did, they were not reported.

Finally, both matters were referred to an ad hoc committee — it seems never to have acquired a more formal title — set up by Grey Walter and to meet that evening.

The terms of reference of this committee no longer exist but Grey Walter's minute does and it is clear that they were wide-ranging. Under the chairmanship of Bremer (Belgium) the members were: Walter and Hill (UK), Baudouin and Fischgold (France), Schwab and Liberson (USA), Jasper (Canada), Monnier (Switzerland), Hertz (Denmark), Moruzzi (Italy) and Ten Cate (The Netherlands); most of these can be found in Fig. 1.1.

The items discussed were:

Electrode materials: It was agreed that silver-silver chloride was the best combination. A sub-committee was to be set up to review the electrochemistry of the whole subject but nothing seems to have come of this.

Electrode placement: Monopolar is a solecism, there being no truly unipolar record; intentional

bipolar derivations are better than unintentional ones; the "setting up of sound and acceptable World Standards was considered a matter of urgent practical importance". Accordingly, a sub-committee was nominated, as follows: Jasper (Convenor), Abbott (USA), Cobb (UK), Dow (USA), Hertz (Denmark) and Kershman (Canada). It never met but Jasper was active in contacts and correspondence and this was in fact the genesis of the 10–20 system.

Recording equipment: Dawson and Walter had already published "Recommendations for the design and performance of EEG apparatus" (*J. Neurol. Neurosurg. Psychiat.*, 1945, 8: 61–64) and Jasper had, that morning, presented the recommendations of the American EEG society, based on those of Dawson and Walter. Again a



Fig. 1.1. The Founding Meeting in 1947, the first International Meeting which was held in the lecture theatre at the National Hospital for Nervous Diseases, Queen Square, London. Two photographic shots were needed because no one had thought of providing a wide angle lens. As a result of the two shots, some faces are duplicated in this composite figure. The duplicates are noted below in parentheses as "repeats". Persons who are not identified are denoted by a question mark.

- Back row: ?, D. Dow, ?, ?, J. Reynell.
- 5th row: ?, St. J. Loe, ?, ?, R.G. Kelly, M.Parsonage, P. Dell, M. Dell, (4 repeats), R. Hess, ?, ?, W. Dunham.
- 4th row: W. Langley, H.B. Morton, W.A. Cobb, W. Henderson, P. Passouant, ?, (4 repeats), ?, ?, G. Moruzzi, M. Fuortes, C. Ajmone Marsan, A. Kleyntjes, J.G. Greenfield.
- 3rd row: J. Drooglever-Fortuyn, M. Roth, G. Verdeaux, J. Verdeaux, J. Dobbing, R.G. Bickford, E.E. Ponchin, (2 repeats), J. Theobald, ?, ?, Mme. Subirana, ?, H. Gastaut, J. Titeca, M.A.B. Brazier.
- 2nd row: A. Baudouin, J. Warfolk, K.-A. Melin, J. Turner, ?, C.C. Evans, (1 repeat), J. Roubicek, Mrs. Ten Cate, M.G. Saunders, N.W. Ellis, S.L. Last, J. Lefèvre, H. Fischgold, J. Ten Cate.
- Front row: M. Heppenstall, D. Hill, A. Lérique, A. Rémond, A. Übersfeldt, J. Lérique, H. Jasper, R. Schwab, F. Bremer, S. Obrador, ?, W.T. Liberson.
- Missing from this picture are, among others: E.D. Adrian, G.C. (Lairy) Bounes, G.D. Dawson, H. Hertz, G. Parr, W. Storm van Leeuwen and W.G. Walter.

Reprinted from "Handbook of EEG and Clinical Neurophysiology", Vol. 1A, p. 30, where other early photographs can be found.

sub-committee was proposed, to collect and test new proposals, with the hope that ultimately “world agreement could be attained”.

Terminology: The variety and ambiguity were unanimously deplored. Hertz was commissioned to collate the various systems, with such help as he needed. This was a much more difficult task than the committee perhaps envisaged and it was to be another 11 years before a Terminology was published.

An international journal: No details are given of the resumed discussion and one wonders that agreement seems to have been reached fairly quickly. Most probably this was because Jasper had gone beyond the stage of dreaming and had given some thought to the practical details. No doubt the committee was ready enough to agree with someone who was himself willing to take the initiative. At any rate, Jasper was appointed Editor and an Editorial Board was chosen to represent as many countries as possible — perhaps a good way to emphasize the international character of the new journal but hardly the most efficient way to conduct its affairs. The committee then discussed the title of the journal and decided on that by which it has been known ever since, fortunately abbreviated when possible to *The EEG Journal*.

An international EEG organization: I cannot do better than quote in full the convener’s minute, a typical piece of Grey Walter’s writing:

“This subject evoked an energetic, candid and tiring discussion. Every shade of opinion was represented; some held that electroencephalography could have no possible relation to the putative social or political scope of an international organization, others considered that since electroencephalography is one of the most successful methods of studying the human brain, nothing human should be thought alien to it.

It was pointed out that although these various opinions could be stigmatised as reactionary, cynical, pessimistic, sentimental, romantic, or fantastic, the fact remained that an international committee was actually in session and had already performed certain useful functions. It was agreed that in so far as continuation of these functions requires the survival of some effective body, the

present ad hoc committee should continue in a state of suspended animation, so that it could be revived whenever further action is required of it. It was proposed and agreed that when other national or regional EEG Societies were formed, their Foreign Secretaries should become ex officio members of the International Committee, so that arrangements for the presentation of the reports from special sub-committees and plans for the proposed II International Congress in 1949 could be made with continuity and efficiency. It was suggested that the present Convener should continue to act as Secretary until such time as a more formal election of Officers and a more detailed constitution could be undertaken.”

Although agreement was not reached on this last point the achievements of this committee in two evening sessions were remarkable and of lasting importance, not least the decision to hold a Second Congress in 2 years time. This First Congress had been small and intimate, rudimentary in its organization and simple in its social affairs — it had to be when food rationing was still very much in force and a restaurant meal could not legally cost more than 5 shillings per head. Nevertheless it brought together many of the subsequent leaders in the field — the first seven Presidents of the still unborn International Federation were present — some for the first time, and the bonds made at this meeting were perhaps as important for the future as were the decisions made by its *ad hoc* committee.

2. The Second International Congress, Paris

As agreed in London the second congress was planned to take place only 2 years later in Paris; the reason for this rather short interval was probably to get into step with the International Neurological Congresses, the fourth of which was to be held in Paris in 1949.

An organizing committee was set up under the presidency of Prof. A. Baudouin and with a wide international membership. Doubtless the real organization and hard work were done by the three French secretaries: H. Fischgold, H. Gastaut and A. Rémond and the treasurer, G. Verdeaux.

The Congress took place in the old “Faculté de Médecine de Paris” on September 1st–5th; each morning and afternoon session began with a report on a particular subject by a well-known scientist, followed by open discussion — there was nothing quite like the round tables and symposia which have since been the rule. Otherwise there were only free communications, all on EEG topics; in fact, the title of the congress was “Congrès International d’EEG” and there was no suggestion as yet that “Clinical Neurophysiology” might be of interest. However, the final day was a joint one with, and organized by, the Neurological Congress and one of the topics there was electromyography, presented by Fritz Buchthal.

This second Congress was much larger and altogether more organized than the first, very amateur, meeting. A fee of \$10 was charged, the accommodation was excellent and the hospitality was memorable; the last included a banquet on the terrace of the Eifel Tower and a reception in the Hôtel de Ville.

The proceedings of the Congress were published in diverse ways: Brazier wrote her “Impressions”, summarizing the scientific content of the Congress (The EEG Journal, 1949, 1: 509–512) and the abstracts of the Communications were published as Society Proceedings (The EEG Journal, 1950, 2: 103–114); the Reports of the principal speakers were edited by H. Fischgold and published (1951) by Masson et Cie. as the 2nd Supplement of the Journal.

3. The International Federation

Walter’s *ad hoc* committee of 1947 had been active and the doubts expressed at that time seem to have evaporated; in the documents that exist there is no question of whether a federation should be formed, only of how this should be done. Gastaut acted as secretary and his unpublished report he listed a number of people who met as delegates of the various national societies: some may indeed have been delegated though others were not and the two English men, at least,

insisted that any decisions reached must be ratified by their society. The subsequent report of the meeting in the Journal (1949, 1: 508) spoke of the “executive council”, though it was surely not constituted by any accepted democratic process; it was as much *ad hoc* as the previous committee had been.

This group comprised:

S. Last (UK)	K. Melin (Sweden)
W. A. Cobb (UK)	T. S. von Frey (Sweden)
R. S. Schwab (USA)	H. Hertz (Denmark)
A. E. Walker (USA)	A. Subirana (Spain)
A. Baudouin (France)	M. Monnier (Switzerland)
H. Gastaut (France)	M. Gozzano (Italy)

together with H. Jasper representing the Journal, G. Zhukova of UNESCO and three of the Congress organizers: H. Fischgold, A. Rémond and G. Verdeaux. They met on September 1st in the Salon des Goncourt of the Restaurant Drouant, over a meal the like of which some of us had not enjoyed for years (see the comment above on London restaurant food in 1947) and it was not until 10.30 p.m. that the real business of the evening began.

Gastaut had prepared two drafts of a constitution of the Federation, with the help of Baudouin, Walter and Schwab, representing the first three national societies, and an international lawyer. The second of these drafts was presented to the “Council”, which made further modifications and the French text was finally agreed 20 min after midnight, after the constitution had been read in its entirety and discussed paragraph by paragraph.

It is interesting to follow the changes of title of the Federation. In the first two drafts it is called “Fédération Internationale d’Electroencéphalographie et de Neurophysiologie Appliquée”, the last word being changed to “Clinique” in the third draft. In the report in the Journal (1949, 1: 508) it is called, obviously incorrectly, “The International Federation of EEG Societies”. In February 1951 Jasper objected that “it is not possible to federate a science. A federation is of people or societies of

people”. Accordingly a poll was taken by letter and several of the extant votes favour the short title quoted above, no doubt because of its brevity. Among them, surprisingly, was that of Grey Walter, who had always insisted that EEG was a technique and that our true business was neurophysiology, whether basic or clinical. However, “Clinical Neurophysiology” was retained and, in the version of the Statutes finally printed, the present cumbersome form was reached.

The General Assembly, as defined by this Constitution, met at 9 a.m. the following morning and elected the first group of Officers, consisting of:

Edgar D. Adrian	Honorary President	UK
Herbert H. Jasper	President	Canada
Robert S. Schwab	Vice Presidents	USA
W. Grey Walter		UK
Fritz Buchthal		Denmark
Henri Gastaut	Secretary	France
Antoine Rémond	Treasurer	France

The Executive Committee comprised the above together with the president and secretary of each Member Society.

It was also decided that the next congress should be in America in 1952, leaving the place and the organization to the American EEG Society.

A further meeting of the General Assembly at 9 a.m. on September 3rd discussed and formalized the affairs of the Journal. It was decided that:

- (1) The Editor and Editorial Board should be appointed by the General Assembly;
- (2) Questions concerning the interior organization of the Journal should be submitted to the International Federation;
- (3) The Federation would not have any responsibility for the debts of the Journal but would receive any profit which might arise.

Understandably the last was accepted unanimously and it has proved to be of far reaching importance. The first two, however, also accepted unanimously, were totally impractical since the General Assembly was to meet only briefly in 3 years time. Experience has shown that appointing

an editor is not a matter of election but of finding someone of known ability and dedication who is willing to accept the task.

Why the publication of the Constitution was delayed is a mystery, perhaps an oversight, but its terms remained unknown to all but a few for over 2 years. The text published (Journal, 1951, 3: 519–522) was that agreed in Paris, with some minor modifications, side by side with an English translation under the title of “Bye-Laws” (French “Statutes”).

This Constitution proved to be a good basis for development but already contained the seeds of future problems. An Executive Committee (Article V) consisting of six officers elected by the General Assembly (at unspecified intervals) and one member (the original document had two) of each society elected annually by his society was hardly a working proposition even in these early days when member societies were few (12 are listed at the date of publication). In addition, Article VII states that the Executive Committee “may also meet at any time at the request of *one* of its members” (my italics). Since a meeting of the Executive Committee has usually involved about half of its members crossing the Atlantic this was an expensive privilege to put in the keeping of any single member. Fortunately it was never exercised.

3.1. *Electroencephalography and Clinical Neurophysiology*

Having been given the go-ahead Jasper assembled his team of helpers, most significantly his Managing Editor. The Journal’s debt to the extrovert enthusiasm of Bob Schwab is incalculable; from an attic office in the Massachusetts General Hospital, with the dedicated assistance of Mary Brazier, he set up the necessary organization and negotiated a contract with Williams and Wilkins. However, the cost of printing in French and Spanish as well as in English proved prohibitive and the contract was amicably dissolved. In Canada

printing in French and English presented no problem or additional expense (in practice, Spanish was never used) and Jasper was able to make a new contract with Thérien Frères of St. Laurent, Quebec, to print the Journal. Jasper was fortunate in finding an assistant, Mrs. M. Prados, who prepared all the manuscripts, supervised the printing and corrected the proofs, aided by his wife Margaret.

Grey Walter was co-editor for Europe, John Knott looked after the Society Proceedings, E.J. Baldes in America and Geoffrey Parr in England edited Technical Notes and Charles Henry painstakingly collected and arranged an Index of Current Literature. Despite this varied assistance the load on Jasper must have been a heavy addition to a busy professional career.

Although the intention was, and has remained, that the Journal should contain only original articles it was necessary at first to solicit them from colleagues — a problem which must be common to most new ventures of this sort. Jasper was fortunate in being able to start his first issue, in February 1949, with a symposium on the “Physiological Basis of Epileptic Discharge” in which the speakers were Gerard, Penfield, Jasper, McCulloch, Darrow, Elliott, Toman and Lennox. Later pages included the names of Walter, Hallowell Davis, Bremer, Brazier, Gastaut, Gibbs and Knott. The last issue of the year contained papers by Moruzzi and Magoun and by Lindsley, Bowden and Magoun, on the brain-stem reticular formation, which were to influence thought on cerebral activation for years to come.

Thus, the Journal made a good start and established for itself a secure position, providing about equal proportions of clinical and experimental results and, in its Society Proceedings, a forum for brief reports of current work. Authors’ Instructions in the first issue (Journal, 1949, 1: 135–136) state that these Proceedings should not exceed 100 words (250 for annual meetings and congresses, with an additional 100 words for discussion). In fact, many of them were much longer than this and as early as February 9, 1949, which must have been within a few days of the appearance of the first issue, the Managing Editor, Schwab, was writing to society secretaries “we have had to reduce the size of the abstract of each communication from 200 to 150 words and no discussion will be included”. By the following year discussions had disappeared but many of the abstracts were longer than ever, in which the Editors seem to have acquiesced, since the next Authors’ Instructions (Journal, 1962, 14: 159–160) accepted 250 words.

When the International Federation was founded in September 1949, Jasper handed to it the ownership of the Journal with “full authority over its management, policy and selection of members of its editorial board”, while retaining responsibility for its debts. This generous offer was made the sweeter by the promise to hand over any future profits to the Federation, though in fact it was many years before this had any significant effect. At this time expenditure greatly exceeded income, partly because of difficulties, due to currency restrictions, in collecting subscriptions from outside North America.