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Author(s): C. I. Bliss

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THE FIRST DECADE OF THE BIOMETRIC SOCIETY*

C. I. BLISS

*The Connecticut Agricultural Experiment Station and Yale University
New Haven, Connecticut, U.S.A.*

The first decade of the Biometric Society offers a hopeful contrast to the daily news of international tensions, where our very survival may depend upon how well and how promptly the world can learn to communicate meaningfully across national boundaries. In this task, international non-governmental organizations, among them our Society, can play important roles. Without national quotas, the largest single national contingent of our regular members, all individual dues-paying scientists, constitutes only 39 per cent of the total membership. The Society sponsors more than 20 meetings a year in all parts of the world, publishes a quarterly journal of growing prestige, organizes periodic international conferences, and is financially solvent. How has this been accomplished in ten short years?

1. *Antecedents.* The first step toward our Society was the formation in 1938 of the Biometrics Section of the American Statistical Association. Within a few years of its founding, the Section adopted an aggressive policy of organizing joint programs with a wide range of biological societies, both at annual meetings of the biologists and, less frequently, at the annual meeting of the ASA. By the end of 1942, meetings had been arranged with the professional organizations in ecology, public health, cereal chemistry, pharmacology, biological chemistry, horticulture, and entomology, as well as with the Institute of Mathematical Statistics. Biologists interested only in the Section could become associate members.

With the suspension of national meetings during World War II, the Section needed other means of maintaining its interdisciplinary contacts. The ASA Board of Directors was persuaded to publish on its behalf a bi-monthly *Biometrics Bulletin*, to be sent to all members and associate members of the Section. As chairman, it was my respon-

*A special invited address to the Eastern North American Region of the Biometric Society at Gatlinburg, Tennessee, April 10, 1958.

sibility to find an editor. I have long believed that the telephone call from New Haven to Raleigh, in which I persuaded Gertrude Cox to accept this post, is one of my major contributions to the science of biometry. At the end of its first year, the *Biometrics Bulletin* was being sent to 979 regular and associate members of the Section, of which some 66 per cent listed a biological discipline as their field of interest.

Concurrently with this development, the ASA named a committee, of which I was a member, to write a new constitution. In reviewing the likely development of the Association, our experience with the Institute of Mathematical Statistics loomed large. The *Annals of Mathematical Statistics* was initially an "affiliate" of the ASA. To insure its support, the Institute of Mathematical Statistics was formed in September 1935, and the *Annals* adopted as its official journal. The transfer of ownership to the Institute soon followed, and by 1938 there was no mention of the American Statistical Association in the mast head or on the title page. It seemed to our constitutional committee that other specialized groups within the ASA might also form their own societies. If so, the ASA might well develop into a federation of statistical organizations, and one of our objectives was to draft a constitution which would accept this possibility without weakening the parent association.

Following this line of thought, as Chairman of the Biometrics Section, I asked a committee headed by A. E. Brandt to draft a tentative constitution for an American Biometrics Society which might supplant the Section. This Committee reported in January 1946 at the annual meeting of the Section. After discussing the pros and cons of organizing as a society rather than as a section, we saw not enough gain to change our status at that time, so the proposal was tabled. Meanwhile, the Section prospered and, beginning with the phenomenally popular issue of March 1947, the *Biometrics Bulletin* became the quarterly *Biometrics* under the vigorous editorship of Gertrude Cox.

2. *The First International Biometric Conference.* Perhaps one attributes more importance to chance encounters than they deserve, but sometimes I speculate on just how much the formation of our Biometric Society depends upon such an incident. The story is this. The first session of the International Statistical Institute after the war, in 1947, met in Washington, D. C., and early in the year they issued a preliminary program, a copy of which I had seen. On March 29 I attended a meeting of the National Research Council Committee on Applied Mathematical Statistics at Princeton University. On the train from New York to Princeton I ran into Charles Roos, an economist and also a member of the Committee, and we rode together to Princeton.

The question of the ISI program arose and I waxed thoroughly indignant over the small place allotted to biometry. I insisted to Dr. Roos that biology and biometry had been more responsible for the development of statistical science than all the other natural and social sciences combined. It seemed to me outrageous that the field which led all others should have been treated so shabbily by the program committee.

Roos' reply was very simple: "If you don't like it, all you need do is to organize an international biometric society." At first the idea seemed to me impossibly difficult, but as we talked the challenge took hold. I realized that here was the missing piece in the puzzle. The advantages of an American Biometrics Society seemed not enough greater than the Biometrics Section to repay the effort of organization. An international biometric society, however, offered prospects not available to a section of a national statistical association. Moreover, we could call upon the experience of the Econometric Society, as Dr. Roos was quick to point out. If we were to form such a Society, the coming meetings of the ISI provided a unique opportunity.

Before leaving Princeton that day I discussed the project with John Tukey and others. We agreed that a first step would be to arrange an International Biometric Conference. Upon returning to New Haven, I wrote Dan DeLury, then Chairman of the Biometrics Section of ASA, pointing out the scant attention given to biometry at the coming international meetings, and suggesting that he name a Section committee both to explore the practicability of a biometric conference and, if it proved feasible, to serve as its organizing committee. In his reply of April 8th, he named an initial committee of four with myself as chairman and power to co-opt such additional members as we needed. In the exchange of ideas and letters which followed we decided that the proposed conference should meet in a distinctively biological setting, preceding and quite separate from the statistical conferences in Washington. On May 10 and 11, three of our committee members, Tukey, deBeer, and myself, met in New York, pooled our information, and decided to go ahead.

With less than four months to complete all arrangements, the task was indeed formidable. We at once enlarged the committee to be representative of quantitative biology in both its statistical and mathematical aspects, with two members named by the National Research Council. The Marine Biological Laboratory in Woods Hole on Cape Cod agreed to serve as host and the Conference was set for September 5 and 6. We needed money. On June 12 I had a very encouraging interview with Warren Weaver of the Rockefeller Foundation and in due course they allotted \$1000 to the Marine Biological Laboratory for our

organizing expenses and the travel of foreign delegates from and to New York.

Meanwhile, the Joint Arrangements Committee for the International Statistical Conferences in Washington cooperated actively, inviting to their meetings the foreign biometricians whom we named. We, in turn, invited to our Conference such of their participants as might be interested. The Institute of Mathematical Statistics scheduled their meetings for August 30 to September 3 in New Haven, making it an easy trip to Woods Hole immediately after their sessions. By July 3rd, with the cooperation of The Connecticut Agricultural Experiment Station, our publicity had included mailing formal invitations to 209 scientists in 20 countries and sending out announcements for publication.

Since an initial objective of the Woods Hole Conference was the formation of a viable international society, we studied the constitutions of the Econometric Society and of other organizations, and wrote and debated a succession of drafts. On September 3 an enlarged committee, including several of our foreign delegates, met in my office in New Haven to review the latest proposal. This defined in as few words as possible a society of individual members without national or other quotas, and with provision for regional or national subdivisions that would be free to carry on the programs that seemed best adapted to their needs. It vested final authority in a broadly representative Council of 12 to 20 members, each serving a three-year term with one-third elected each year by a mail ballot of all members. The Council in turn, was to elect a President, Secretary, and Treasurer. Accordingly, when we went to Woods Hole, our "homework" had been done.

The Conference opened on September 5, 1947, most members arriving the day before. The weather was benign and the setting propitious. The Conference was welcomed to the Laboratory by Charles L. Packard, then Director. In an initial business session G. Teissier, R. A. Fisher, and myself were elected Chairman, Co-chairman, and Secretary respectively. Following scientific programs on quantitative genetics and recent biometric developments overseas, Co-chairman Fisher named a committee of 12 to recommend a suitable form of international cooperation in biometry. That evening, after a clambake, the committee revised the provisional draft constitution, which was then mimeographed.

At a business session the next morning, September 6, the full Conference debated and approved the draft Constitution, article by article. Following a resolution that the drafting committee and such others as it might designate should constitute the first Council of the Society and that all persons present or invited to the Conference should be

charter members if they so desired, the Conference, sitting as the Biometric Society, adopted the constitution unanimously, and our Society was born.

An afternoon scientific session on allometric growth, the adoption of suitable resolutions, and a farewell message by Chairman Teissier brought the Conference to a close. The Council met immediately afterwards, elected three additional members, and for officers R. A. Fisher as President, J. W. Hopkins as Treasurer, and myself as Secretary. As Editor of *Biometrics*, Professor Cox offered to publish our Proceedings in the next two issues. After considering an alternative proposal by the *American Naturalist*, the Council accepted Miss Cox's offer and her further offer to use *Biometrics* provisionally as our journal by means of a block subscription with the ASA.

Following Woods Hole, most Council members attended the International Statistical Conferences in Washington, where we met again on September 15. At this session, the Council was further enlarged, and four Regions approved with provisional officers. Other motions set annual dues for 1948 at \$4.00, including a subscription to *Biometrics*, and authorized regional Secretary-Treasurers to retain \$1.00 or its equivalent for regional use. Finally, the Council adopted the descriptive clause which appears on the letterhead of the Society: "An international society devoted to the mathematical and statistical aspects of biology." The Council had done its part; it was now up to the officers, principally the Secretary.

3. *The first years.* Soon after returning from the Statistical Conferences in Washington I reported the formation of the Society to my then Director Slate with considerable enthusiasm. He brought me to earth with a bump. He assured me that I had let myself in for a far larger job than I realized. The Society would have to provide a competent Executive Assistant to handle the routine if I were to meet my obligations at the Experiment Station. Moreover, he knew of no room at the Station in which this assistant and the necessary office equipment could be housed. Until we had enough paying members, our only hope was to find a financial angel. Since the Rockefeller Foundation had got us born, he suggested that they were the logical ones to keep the infant alive until it could walk.

Unfinished business from the Woods Hole Conference more than filled the next few weeks. It was not until November 13 that the first report of the Secretary was mailed to the Council. This has since become our primary method for reaching decisions, the first Council "memo" containing, for example, a proposal for electing Fellows of the Society, which was turned down. In order to approximate

the give and take of a full Council meeting, any proposal receiving an explained negative vote has been resubmitted for a second ballot in the next memo, often in a revised form and with a summary of all comments returned with the first ballot. This has helped keep the Secretary in his place, a difficult task when all decisions have to be reached by correspondence!

The following day I again met with Warren Weaver at the Rockefeller Foundation in New York. After reporting on the Woods Hole Conference, I told him of our new financial dilemma. Although their books were closed for 1947, he was sufficiently encouraging for a grant in 1948 that soon after I asked Mrs. Watkins, the wife of Professor John H. Watkins, the first Secretary of ENAR, to act as my Executive Assistant. A few days later she started work in our first office, a corner of the Watkins' living room. Meanwhile, in preparation for the Christmas meetings of the ASA and IMS in New York, a few of us in easy reach drafted provisional by-laws for the Eastern North American Region.

These New York meetings marked another milestone in the development of the Society. The ASA Board of Directors formally approved our using *Biometrics* as the Society journal at a block subscription rate. On December 27 in Chicago and on December 28 in New York, organization meetings of ENAR debated and adopted its by-laws, subject to Council approval, thus establishing the first Region of the Society.

We also saw the start of a controversy which still continues. One group held that, with the formation of the Society and ENAR, the Biometrics Section of the ASA was no more needed by the ASA than a section on mathematical statistics to duplicate the work of the IMS. This view was promptly challenged by other ASA members, who asked why the 108 year-old ASA should surrender one of its most active sections to a Society only months old and as yet unproven. Moreover, ENAR was limited geographically to the territory east of the Rockies whereas the ASA's jurisdiction extended from coast to coast. The present position is that all sessions on biometry at the annual meetings of the ASA are sponsored by both the Section and the Region, while the Region organizes other joint sessions such as had been handled formerly by the Section.

Quite apart from the meetings themselves, the Society advanced on another front. After an invaluable briefing by Sam Wilks, I visited the Rockefeller Foundation on December 30 and talked with Mr. Chadwell, from whom I learned that a three-year grant in diminishing amounts would be in line with their policy, and that amounts less than

\$7500 did not need separate action by their Board of Directors. With this background, I asked Gertrude Cox how to ask Foundations for money and together we worked out a three-year budget for spending \$7400. In submitting it to our Council on January 5, I reported a membership of 143 but predicted a rise to 2500 by 1951, 1000 more than we have reached to date. The final proposal was approved and submitted a month later. As of March 1, the Rockefeller Foundation granted \$7400 to Yale University to be expended on behalf of the Society as recommended by its Secretary. Since we were not yet recognized as tax exempt, they could not give us the money directly.

With the grant we purchased desk, file, and other much-needed equipment, all duly installed in the Watkins' living room, and began a concerted drive for new members. Additional regions were organized in rapid succession, the British Region in May, the Western North American Region in July, the Australasian Region in November, a French-Italian Region the following February, and an Indian Region the next May. Early in this development, a question arose over the relation between the Society and its Regions, primarily over their jurisdiction in respect to the individual member. This and other policies were resolved with the adoption of Council By-laws, dated July 12, 1948.

Operations in the central office suffered a serious set-back in September by the sudden death of Jack Watkins, the subsequent resignation of Mrs. Watkins as Executive Assistant, and the necessity of finding new quarters. Early in November we moved temporarily to a room in the Department of Public Health at Yale, but by June were office hunting again, in competition with University deans who needed space for new professors. To their surprise, we found a very adequate room in the Laboratory of Applied Physiology at 52 Hillhouse Avenue, where the Society had its headquarters for the next six years. When our first Directory went to press in July 1949, the organizing drive conducted by the Regions and by the Secretary's office had brought our membership to 900.

The publication of our first Directory completed the second stage in the history of the Society. Its further development may be traced under five headings: regional organization, international affiliations, international conferences and symposia, *Biometrics*, and membership composition and growth.

4. *Regional organization.* In our regional organization we have had to break new ground. Our objectives were two-fold: (1) to give each member a greater opportunity for direct participation in Society activities, and (2) to minimize exchange difficulties. At the same

time each Region needed sufficient autonomy to develop the pattern best adapted to its needs. The problem has been solved in varying ways.

In its first ten years, our largest region, ENAR has sponsored some 37 meetings, each with one to ten scientific sessions. Nearly all of these have been held jointly with other organizations. At the annual meetings of the ASA each December or September, the Region has co-sponsored an average of seven sessions with the ASA Biometrics Section, the IMS, or both. In December 1950, ENAR completed its formal affiliation with the ASA and to this date it is the only affiliated society in the ASA. Since 1950, the Region has met each spring with the IMS for an average of five sessions per meeting, all on the eastern seaboard and ranging from Princeton to Gainesville.

Meetings with biological groups have had fewer sessions. At five spring meetings with the Federation of American Societies for Experimental Biology, four with the Pharmacologists, and one with the Immunologists, each single joint session has had a relatively large attendance. At five Christmas meetings of the AAAS and five September meetings of the American Institute of Biological Sciences, first organized in 1950, the Region has averaged about three sessions per meeting, many of them held jointly with their affiliated societies, including the Ecologists, Geneticists, Horticulturists, Naturalists, Phytopathologists and Plant Physiologists. At three meetings of the American Public Health Association, ENAR has co-sponsored one or two sessions. A separate clinic session in December 1948 with the Entomologists was recorded and issued later as a multilithed bulletin by the Secretary's office. A two-day session with the New York Academy of Sciences in 1949 formed a 153-page issue of the *Academy Annals*. Most impressive of all, a five-week summer Biostatistics Conference at Iowa State College in 1952, co-sponsored by ENAR, was published in a 600-page volume by the Iowa State College Press.

Since its formation in 1948, the Western North American Region has held eleven meetings, usually of one to three days in June, and ranging from Seattle in the north to Pasadena in the south. Besides the IMS, co-sponsoring organizations have included the ASA, the Ecological Society, the AIBS, and the Mathematical Society, the number of sessions per meeting ranging from one to four.

As no foreign exchange was involved, members in ENAR and WNAR paid their dues (until 1955) directly to the general Secretary; elsewhere, except for members at large, dues were collected by the Regional Treasurers and National Secretaries. In 1949 and 1950 many currencies were devalued relative to the dollar, which automatically raised the dues of all members in those countries. Moreover, their incomes were

already substantially lower than in the United States and Canada. When the Rockefeller grant ended early in 1951, our annual dues of \$4.50, adopted in 1949, were clearly inadequate and were boosted differentially in ENAR and WNAR to \$7.00, beginning in 1951. At the same time we set up a new class of "sustaining members" at \$100 per year, for organizations actively interested in the objectives of the Society. With one exception, all of our sustaining members have been from ENAR and have never numbered more than nine. We could do with more members in this class.

The British Region also dates from the first year of the Society and has had 30 meetings in its ten years, usually half-day or one-day sessions in London. Only exceptionally have they been co-sponsored with other organizations, on one such occasion with two chemical societies. A summer meeting in 1952 at Edinburgh lasted two days, unusually long for the British Region. They have streamlined their collection of dues by the unique British contrivance of "Banker's Orders," by which a member can instruct his bank to transfer his annual dues to the account of the Society on a given date each year without further notice, a device which less lucky treasurers must envy.

Quite a different organizational pattern has developed in France. In accord with a law of 1901 governing official French societies, the French biometricians formed in 1949 the separate *Société Française de Biométrie* and at the same time the *Région Française* of the Biometric Society, with the proviso that all full members of the *Société Française* must be members of the Biometric Society. The French Society-Region has met two or three times each year in Paris, usually at the Zoological Laboratory of the Sorbonne, in half-day meetings with one to three papers and discussion. Although the regulation has since turned up in other countries, the French were the first to require a signed and certified annual bill in triplicate from the Society Treasurer, listing the name of each member owing dues payable in dollars. With this bit of formality, they have been able to obtain the necessary foreign exchange.

The Region for Belgium and the Belgium Congo, organized in December 3, 1952 as the *Société Adolphe Quetelet*, has followed the French pattern. Its one to three meetings a year in Brussels have featured speakers from other countries more often perhaps than any other Region. This highlights another advantage of our regional organization, the opportunity it affords for visiting scientists to meet associates interested in biometry.

Our members in the Australasian Region have had to cope with long distances, so that their activities have concentrated on the biennial

meetings of the Australian-New Zealand Association for the Advancement of Science. Since its organization in 1949, four meetings with the ANZAAS are on record, in Sydney, Canberra, Melbourne, and most recently at Dunedin, New Zealand, plus a few meetings of the Region alone in Melbourne and elsewhere. In recent years, proportionately more members have been enrolled in this Region than in any other of similar age; in the same period the President of the Society has been appropriately an Australian, E. A. Cornish.

The Italian Region met first in March 1951 at the University of Milan and annually since in Florence, Rome, Pavia, and elsewhere in one-day sessions. The Region was host to the Third International Biometric Conference in 1953, a major and most successful operation, thanks to the skill of the Regional Secretary, L. L. Cavalli-Sforza. In 1955 the Italian Region broke new ground under the same leadership by organizing an International Seminar on Biometric Methods at Varenna on Lake Como. From nearly 100 applicants, 56 students were accepted, all but one an Italian resident. A concentrated program on modern statistics in biology completely filled the fourteen working days of the course. Encouraged by its success, the Region sponsored a second course on biometric methodology in Milan on October 8-20, 1956, again with both lectures and laboratory.

The first steps towards the formation of a German Region in Frankfurt in September 1953, were followed by a successful three-day biometric conference at Bad Nauheim in January 1954. A year later at a second, similar biometric conference, the Region was formally inaugurated and has since met once or twice annually, usually with two or three day meetings in January. It is now our fourth largest Region.

Our youngest region, the Brazilian, was organized in January 1956 following preliminary steps during the international Biometric Symposium at Campinas the preceding July. It has since met annually in São Paulo and in July 1956 with the Brazilian Association for the Advancement of Science.

Our policy has been to encourage the formation of a Region as soon as we had 30 to 35 members within a nation or natural area. Only one region has been formed and later abandoned. An Indian Region was formed during a meeting of the Indian Science Association at Allahabad in January 1949. With 46 members listed in the 1949 Directory, it met again in Poona a year later. When the rupee was devalued, the Indian Region was unwilling to raise its dues to cover the devaluation, but in fairness to our other members, the Society could not make an exception. After 1950 only a handful continued as members at large, but by 1952 we had recruited enough more to name a National Secretary for India and this is their present status.

The problem of converting national currencies to dollars for transfer to the central office of the Society was only partially solved by the formation of Regions. In 1949, the Council approved the appointment of a National Secretary in any country with 10 or more members. Each year he collects the dues of his compatriots and arranges at least one meeting with a biometric program. In return, he retains the equivalent of one dollar per member toward his expenses, the same amount as each Regional Treasurer,* sending the remaining \$3.50 to the Society Treasurer.

In December 1949, Secretaries were named for Denmark, Italy, and the Netherlands, and later for Belgium, Germany, India, Japan, Sweden, and Switzerland. In Italy, Belgium, and Germany the National Secretary has been supplanted by a Region, as noted above. Although their numbers were sufficient by 1953, our members in Japan have preferred to continue with a National Secretary as the "Chapter of Japan." After their second meeting and again after their third and fourth meetings, they have published 50 to 60 page proceedings from typewritten copy, partly in Japanese and partly in English. Our members in the Netherlands have met with two other Dutch biometric groups, usually in Utrecht, in a total of eight or more meetings.

Members in Switzerland have not only convened annually since 1954, but in July 1956 held a five-day biometric seminar for agronomists in Zurich with 31 participants and five lecturers. They have also been instrumental in arranging a two-week international Biometric Seminar and Symposium at Linz, Austria, beginning September 24, 1956. Its program was patterned after that held the preceding year in Varenna and the participants numbered 150 from 11 countries.

In the first ten years of our existence, the regional subdivisions of the Society have organized 152 or more meetings around the world, two-thirds of them in the last five years. These meetings represent varying numbers of sessions, ranging from a single session with one paper to ten sessions, each with three or more papers. I know of no other international scientific organization that can match this record.

5. *International affiliation.* In seeking the appropriate international scientific body with which to affiliate, we turned first to the International Council of Scientific Unions (ICSU). Our organizational pattern, however, as an individual membership society, differed too sharply from that of its constituent unions for direct affiliation. In 1948 the 25-year old International Union of Biological Sciences (IUBS), a member of ICSU, invited the Society to provide the Secretariat of a new section on biometry, to which we agreed, and in 1952, following a

*Except in ENAR, which has been able to operate since 1950 with only 25 cents per member for all over the first 100.

change in policy, the Society itself became the Biometric Section of the IUBS.

The Society has been represented and vocal in the last three General Assemblies of the IUBS. At its 10th Assembly in Stockholm in July 1950, President Linder and B. Matérn summarized our activities during the preceding three years and reviewed plans for the future, including a project on the teaching of biometry. At the 11th Assembly in Nice in August 1953, attended by R. A. Fisher, M. Lamotte, A. Linder, and myself, we again reported on the activities and plans of the Society. Early in 1955, a preliminary report on courses in biometry was distributed to key members of the Society and revised with the aid of their comments. The final statement on "Biometric Needs and Opportunities in Biological Education" was presented during the 12th IUBS Assembly in Rome in April 1955, attended by L. L. Cavalli-Sforza, A. Vessereau, and A. Linder, where our organizational pattern was strongly commended by President Horstadius.

At all three Assemblies the Biometric Society was voted financial support, in sums ranging from \$100 for minor projects to \$2500 toward an International Conference or Symposium, largely from UNESCO grants. During the 12th Assembly, the sections of the IUBS were regrouped under Plant Biology, Animal Biology, and General Biology. In this last division the Society forms the Section of Biometry, the others being Cell Biology, Genetics, Microbiology, and Limnology.

As already noted, our association with the International Statistical Institute (ISI), founded in 1885, began in 1947 during the First International Biometric Conference. This led to our formal affiliation with the ISI in December 1948, each organization being represented in the other by its Secretary. The cordial cooperation of the ISI and the interest of many of our members in its activities have been largely responsible for the timing of most of our international meetings immediately before or after the biennial Sessions of the ISI, usually in a nearby city. In addition, the Society has sponsored individual programs at ISI Sessions, there being three of these at the Stockholm meetings in August 1957, on problems of experimentation, statistical genetics, and statistics in medical research respectively. The very considerable travel funds available for delegates to the ISI have made it possible for our Biometric Conferences to obtain speakers from a wider geographical area than would otherwise be possible.

The World Health Organization is the third international body with which the Society is associated. Since our affiliation in 1949, representatives of the Society have attended a number of their international and regional assemblies. This is a collaboration which might

well be enlarged in view of the wide-ranging activities of the WHO in areas of mutual concern.

6. *International conferences and symposia.* In discussing our first conference in Woods Hole, I described some of its problems, most of which have reappeared in the four international meetings which the Society has since sponsored. Of these, one of the most important is finding an able secretary (or chairman) for the local arrangements committee, whose task includes raising a sizable kitty from local and national sources. In speed of publication, our biometric conferences rate better than most international congresses, the general proceedings and abstracts appearing in the next few issues of *Biometrics*, together with a sizable proportion of the original papers. Reprints of these papers and reports have then been assembled and bound separately, often with the aid of subsidies from the IUBS and other sources. Since these are readily available, I need only summarize them in order.

The Second International Biometric Conference met on August 30 to September 2, 1949 at the University in Geneva, Switzerland, with President Fisher presiding. At the opening session, Professor A. Franceschetti addressed the Conference successively in French, English, and Italian and after an afternoon program on experimental design, entertained us for tea at his estate on Lake Geneva. Morning and afternoon sessions in the next three days concerned recent applications of biometric methods in genetics, biometric aspects of biological assay, the present status of biometry, industrial applications of biometry, and teaching and education in biometry, concluding with a session of contributed papers. Evening receptions by the Canton and Town of Geneva, opening and closing business meetings, and two Council meetings completed the program. The 103 delegates came from 19 different countries, with the largest national delegation of 18 from Great Britain. On September 3, many of us traveled from Geneva to Berne for the ISI meetings on a special all-day tour through some magnificent scenery. Much of the success of the Conference was due to the splendid work of the local secretary, A. Linder.

The next international session of the Society was a symposium on December 17–18, 1951, on “Biometric problems in the prediction and estimation of the growth of plants in tropical and sub-tropical regions.” The Indian Statistical Institute in Calcutta was host, President Linder arranged the program and presided, and about 150 persons attended. The three papers presented on the first evening were followed by two more the following morning, in each case with extensive discussion. The symposium was sponsored by the Society in its dual

role as a Society and as a Section of the IUBS. The 116-page Proceedings were published later in Calcutta for the IUBS.

The Third International Biometric Conference met on September 1-5, 1953, at the Hotel Grande Bretagne in Bellagio, Italy, on Lake Como, immediately following the Ninth International Genetic Congress, also in Bellagio, and just preceding the 28th Session of the ISI in Rome. After speeches of welcome by our Italian hosts, Professor Darmonis opened the scientific program with his presidential address. Morning and afternoon sessions on each day were concerned with the first course in biometry, mathematical problems in genetics, methodological problems in biometry, biometry in immunology, biometric methods in agriculture, functional relations in experimentation, contributed papers, and industrial applications of biometry. A series of exhibits on the second evening, a meeting of Council and two short business sessions completed the work of the Conference. For diversion, we were entertained by a motorboat excursion on beautiful Lake Como, an evening party at the Lido, and a banquet. Of 125 participants in the Conference, representing 24 different countries, 101 were members of the Biometric Society. The primary burden of this session was carried superbly by L. L. Cavalli-Sforza of Milan.

Our next international meeting, a symposium on "The role of biometric techniques in biological research" in Campinas, Brazil, on July 4-9, 1955, followed the 29th Session of the ISI near Rio de Janeiro. The program committee was chaired by President Cochran and the local committee by C. G. Fraga. The University of São Paulo served as our host. Registration totalled 98 from 17 different countries, with 62 from Brazil. Professor Cochran opened the scientific program with his Presidential Address. The following sessions were devoted to biometrical genetics, experimental designs for perennial crops, other experimental designs, statistics applied to animal-feeding experiments, sampling techniques, bioassay, and medical statistics, plus two panel discussions. On the lighter side, we enjoyed an excursion to Piracicaba, two social evenings, and a visit to a dairy and coffee farm. One result of the symposium was the formation of the Brazilian Region the following January, our first in Latin America.

In any evaluation of international meetings, I would stress again their invaluable role in promoting international understanding through personal discussions of common problems and the good will generated by the unstinting hospitality of our hosts.

7. *Biometrics.* A major factor in the success of a scientific society is its journal, for many members the only tangible return from their annual assessment. When our Society was formed, we were fortunate

in obtaining space in *Biometrics* for Society news and in arranging a block subscription for our members. Conversely, *Biometrics*, then in its third year and with the struggles of the first two years still vividly in mind, stood to gain more subscribers and a new source of articles. Even in our first year, however, it was evident that this was only a temporary solution and that the Society would need its own journal. Since all members of the editorial board of *Biometrics* were charter members of the Society, our first choice was a transfer of *Biometrics* from the ASA to the Society, following the precedent established in the preceding decade by the transfer of ASA rights in the *Annals of Mathematical Statistics* to the IMS.

In accord with a resolution of ENAR at its business meeting in December 1948, the Council of the Society voted in February 1949 to negotiate with the ASA for *Biometrics*. To implement this decision, President Fisher named a special committee consisting of Gertrude Cox, John Hopkins, and myself. Tentative terms of the transfer were submitted to Council in May 1949, approved by a vote 21 to 1, and reconfirmed at a Council meeting during the Geneva Conference. The transfer was also approved by a large majority of members of the ASA Biometrics Section in a mail ballot during the summer of 1949, and confirmed unanimously at its annual meeting the following December. The ASA Board of Directors and Council then approved the transfer and named a negotiating committee to arrange its terms. These were completed in legal form, signed in August 1950, and published in *Biometrics* for December. Starting with Volume 6, *Biometrics* became the property and official journal of the Society. The Society was doubly lucky in Miss Cox's consenting to continue as editor, with the management of the journal remaining at the Institute of Statistics in Raleigh.

The Editorial Board was at once enlarged on an international basis and a statement of policy adopted after discussion in Council memos. The refereeing of all papers before acceptance was continued, except for papers delivered at an International Conference and approved by its organizers, when the cost of publication was subsidized separately. Financial accounts for *Biometrics* and for our other activities have been kept separately from the start. When our American and Canadian members were charged \$7.00 per annum, the price of *Biometrics* to non-member subscribers, other than the ASA block subscription, was also increased to \$7.00. By 1957, its circulation had increased to over 2800, including 890 non-member subscribers. This growing circulation, together with the sale of back issues, has made *Biometrics* self-supporting and built up a reserve, even though 60 per cent of Society members

pay less than the cost of printing and mailing their copies. Any uncertainties as to our ability to publish *Biometrics*, which led to a stipulation that it revert to ASA if discontinued within five years, have been laid decisively at rest.

Biometrics has also had its problems. One is the periodic complaint by our biological members that the journal is becoming too "high brow" statistically for them to understand, and the counter-complaint of the Editor that good biological, less technical manuscripts are hard to come by, despite numerous pleas for material. After all, editors cannot accept papers that are not submitted for publication. When Professor Cox resigned as Editor, she was succeeded by J. W. Hopkins of the National Research Council of Canada, the transfer being completed during 1955. Early in 1957, Dr. Hopkins suffered a protracted illness which necessitated a second transfer of the editorial offices and back issues, with attendant delays. This has given us our present Editor, Dr. Ralph Bradley, a Canadian by birth and early education, with editorial offices in the Department of Statistics of the Virginia Polytechnic Institute at Blacksburg.

Although *Biometrics* is an international journal, most of its papers are in English, and over the years it has become more technical and advanced statistically. In 1953 Dr. Leopold Martin, then Secretary of the Belgium Region, proposed starting a second journal to be called *Acta Biometrica*, with more emphasis on quantitative biology and less theoretical statistics. It was to appear primarily in languages other than English and draw upon papers given at Regional meetings in continental Europe. His proposal was discussed at length by members of Council and others. Although in sympathy with the objectives of the proposed journal, we were unable to solve essential details, such as its editorial policy, relation to *Biometrics*, and financing, so that the proposal was never implemented.

8. *Membership composition and growth.* The membership record has been a primary responsibility of the Secretary. A member in arrears for dues is removed from the mailing list for the June *Biometrics* and after further notices, he is assumed to have resigned if still unpaid by the following year. Since the dues of American and Canadian members were collected initially by the Secretary, the two offices were combined in 1951. By 1955 our Regional Treasurers and National Secretaries were collecting all dues, except those from members at large, so that with the election of M. J. R. Healy of England as Secretary and the decision to keep the general Society funds in dollars, the two offices were again separated. In 1957, when our present Treasurer, Allyn Kimball, took over, the Society's accounts were moved to Tennessee.

From the start, the Secretary has been responsible for publishing a Directory which would include information on member activities and interests. This has proved a much larger project than we first anticipated, so that directories were issued only in 1949 and 1953 from the New Haven office and in 1957 from Harpenden. The member interests of the 900 listings in 1949 were analyzed by John Tukey in *Biometrics* for June 1950; a more extended study of the 1144 members in 1953 by Colin White appeared in *Biometrics* for December 1954. A comparable study of our 1957 Directory would be most welcome. The following summaries are pertinent.

The geographic as distinct from Regional distributions in Table 1

TABLE 1
GEOGRAPHICAL DISTRIBUTION

Area	No. of Members			Percentage		
	1949	1953	1957*	1949	1953	1957
USA	547	557	547	60.8	48.6	38.8
Canada	23	35	34	2.5	3.0	2.4
Great Britain	107	139	174	11.9	12.1	12.3
Australasia	38	43	69	4.2	3.7	4.9
France	45	50	63	5.0	4.4	4.5
Italy	24	53	73	2.7	4.6	5.2
Germany	1	22	97	0.1	1.9	6.9
Belgium	0	63	48	0.0	5.5	3.4
Other Europe	32	64	104	3.6	5.6	7.4
Brazil	7	9	70	0.8	0.8	5.0
Other Latin America	19	25	21	2.1	2.2	1.5
Japan	0	38	45	0.0	3.3	3.2
Other Asia	50	22	19	5.6	1.9	1.3
Rest of World	7	27	46	0.8	2.4	3.3
Total	900	1147	1410			

*Members in good standing at end of 1957.

show a steady overall gain in membership, especially in areas outside the United States. These are based upon the first two directories and a count of members in good standing at the end of 1957. Our deficiencies are most marked in Latin America (other than Brazil), in Asia, and especially in countries of the Communist bloc. The 1957 Directory lists five or more from East Germany, one from Czechoslovakia, two from Rumania, and one from the USSR. To promote a better understanding between East and West, members from this area would be doubly welcome.

Member interests present a problem in classification where no two people are likely to agree. In Table 2, I have attempted to summarize the analyses of our 1949 and 1953 directories in approximately equivalent categories. Many members have overlapping interests in two or more fields and these have been prorated fractionally. The biggest change from 1949 to 1953 is the increase in statistics, a trend

TABLE 2
MEMBER INTERESTS

Interest	1949		1953	
	No.	%	No.	%
a. Mathematics	86	10.3	108	9.5
Statistics	144	17.2	371	32.5
b. General biology	183	21.8	192	16.8
Applied biology	92	11.0	148	13.0
c. Medical sciences	142	16.9	158	13.8
d. Human biology	34	4.1	39	3.4
Public health	84	10.0	72	6.3
e. Other	73	8.7	54	4.7
Not identified	62	—	2	—
Total	900	100.0	1144	100.0

which is reflected in our ENAR programs and probably also in the contents of *Biometrics*. I wonder whether we are reaching the biologists as effectively as we should, if we are to live up to our professed objective as a "society devoted to the mathematical and statistical aspects of biology."

Although we have almost no restrictions on membership, the educational and employment status of our members certainly qualifies us as a "learned society," judging from the 1953 Directory. As summarized in Table 3, some 55 per cent of our members have a doctor's degree and there are probably very few if any without a bachelor's degree or its equivalent. Educational and governmental institutions employ three-fourths of our members and a large proportion of the others are engaged in research or development, whether in non-profit institutions, such as hospitals and research institutes, or in the research laboratories of private industry. In these two aspects we can be reasonably content.

In another area, however, we have little ground for smugness. This is in our ability to hold members. I have compared the alphabetical listing in the Directories for 1949 and 1953 and similarly for

TABLE 3
EDUCATIONAL AND EMPLOYMENT STATUS—1953

Academic degree	%	Type of employer	%
Medical (M.D., M.B., D.P.H.)	9.6	Educational	43.0
Other Doctorates	45.7	Governmental	31.8
Masters	15.4	Private industry	14.9
Bachelors	13.6	Non-profit	5.4
Other and not given	15.6	Other	4.9
Total	99.9	Total	100.0

1953 and 1957, with the results shown in Table 4. Membership gains have been impressive but our losses disquieting. Most of our members belong to a number of scientific organizations, in some cases ten or twelve, and if they see no tangible benefit from their membership, they are not likely to continue. Of the 900 members listed in 1949, 37 per cent were missing in 1953 and of the 1144 members listed in 1953, 29 per cent were missing in 1957. Fortunately, the rate of loss

TABLE 4
MEMBERSHIP GAINS AND LOSSES
Number of members

Area	1949 only	1949+ 1953	New in 1953	Lost from 1953	1953+ 1957	New in 1957
USA and Canada	225	345	247	151	441	148
Other	112	218	334	183	369	398
Total	337	563	581	334	810	546

Area	% loss from		Net % gain	
	1949	1953	1953	1957
USA and Canada	39.5	25.5	3.9	-0.5
Other	33.9	33.2	67.3	38.9
Total	37.4	29.2	27.1	18.5

is diminishing but it still seems too high to be viewed with complacency.

If we subtract the losses from the gains in successive directories, we obtain the net percentage gains in the lower part of Table 4. In 1953 the net gain in the two North American Regions was not quite 4 per cent, and in 1957 they had a loss of 0.5 per cent. In contrast, the corresponding net gains in the rest of the world were 67 and 39 per cent. These figures contrast with the growth of our non-member subscribers to *Biometrics*, who numbered about 400 in mid-1951 and 890 in 1957. There is evidently no lack of interest in biometry and its applications, as judged from a more than doubling of the number of subscribers in six years, almost entirely through the efforts of the Editor's office. The increase of 900 to 1400 members in the longer period from 1949 to 1957 suggests that we have by no means exhausted our opportunities for growth.

The second decade. How can we make our second decade even more fruitful than our first? I have already mentioned several opportunities for development, especially in enlarging and holding our membership. This is primarily a project at the regional and national level. Our contacts are now more fully developed with organizations in statistics than in the various biological disciplines. Additional joint sessions, primarily at biological meetings, would contribute to closer and more varied contacts. Because of its interdisciplinary character, the Biometric Society can support a program of international conferences, congresses, and symposia at closer intervals than the usual three to five year gap between the international congresses in subject matter fields.

Paralleling our growing activity at scientific meetings, we will need an expanded publication policy, initially, at least, by enlarging *Biometrics*. A welcome addition would be a section of book reviews for books on statistical methodology and quantitative biology. Because articles of biometric interest are published in a wide range of media, including experiment station bulletins, journals in agriculture, medicine, other fields of biology, psychology, and the physical sciences, as well as in statistical and mathematical journals, tracking down the literature is even more complex in biometry than in other sciences. This task would be aided materially by including in each issue one or more review articles on recent advances in a specialized field, both in methodology and in the various areas of application. These could be patterned, in part, after those in the Annual Reviews of Pharmacology, Entomology, etc. or in Physiological Reviews. A year or more in advance the editor for the series would invite a specialist in each field to review the recent advances in his area and provide an adequate bibliography.

Proceedings of our international meetings, which now appear in

several issues of *Biometrics*, might be published in a special supplement and made available for separate distribution. Even though English has become the most nearly universal scientific language, our Society would have a greater impact if adequate summaries of the articles in *Biometrics* could be issued in other languages, preferably as joint projects of individual Regions and *Biometrics*.

Where instruction in modern biometry is not now available, Society-sponsored seminars, such as those held at Varenna and at Linz, could be effective in encouraging universities to institute suitable programs. These should include special summer courses for students at various levels, such as are now current in parts of the United States. The Society could help maintain their quality by preparing general recommendations as to content, prerequisites, and suitable texts, that would be available on request.

As our membership and influence grow, we may anticipate assignments which we would be better able to fill than any other organization. We may be asked to recommend referees for articles appearing in other journals but which require competent biometric refereeing. Biometricians seem to be more mobile internationally than many other scientists, calling for an employment exchange within the Society on an international as well as a regional basis. We may find ourselves advising international and national bodies on the feasibility of specific projects and then participating in their execution.

None of these suggestions is revolutionary. Their very obviousness should make them logical developments of our first decade. They still leave plenty of scope for proposals by younger, more imaginative minds.