supplies, covers ground water recharge, and reclamation of saline waters.

As a fitting companion to Committee Print No. 30 we find No. 31 dealing with the impact of new techniques on integrated multiple-purpose water development. To meet a situation within this century in which water requirements will cause the United States to go beyond the traditional approaches to water development, the report suggests a new type of approach termed "comprehensive development", which is defined as "the application of integrated multiple-purpose design, planning and management which includes joint consideration of ground and surface water, conservational and other measures for engineering of demand, and the treatment and management of water having a substandard quality". This report has been prepared under the direction of Dr. Edward A. Ackerman.

Finally, in Committee Print No. 32, we find a summary report on the estimated supply and demand for Water in the United States for 1980 and 2000 by "Resources for the Future". The basic projections and information supplied by the Federal agencies for each of the 22 regions into which the contiguous parts of the United States were divided for the purposes of the study has enabled tentative balance sheets of water supply and demand to be drawn up. The report also deals with the basic physical problems of providing the necessary facilities for storage and treatment of water. It shows very clearly the great economic advantages that could follow from the more complete treatment of wastes.

These reports, together with the hearings, occupy some 5,800 pages and provide a most detailed picture of the present practice of use of water in the United States, and of impending problems. The final report of the Select Committee on National Water Resources to the Senate (No. 29 of the Eighth-seventh Congress, First Session) summarizes the findings and gives the Committee's conclusions and recommendations. The need for meeting problems before they arise is stressed, and five major categories of effort are thought desirable so as not to inhibit national or regional economic growth: (*a*) regulating stream-flow through the construction of surface reservoirs and watershed management; (*b*) improving the quality of streams through pollution abatement programmes; (*c*) making better use of underground storage; (*d*) increasing the efficiency with which water is used through the elimination of wasteful practices, improved sewage treatment methods, recirculation, increased irrigation efficiency, and substitution of air for water cooling; (*e*) increasing the natural yield of water by desalting, weather modification, and other artificial means.

The Committee's main recommendations to Congress are accordingly:

(1) The Federal Government, in co-operation with the States, should prepare, and keep up to date, plans for comprehensive water development and management for all major river basins in the United States. The Executive Branch should be requested to submit plans to Congress in January 1962, for undertaking and completing such work in all basins by 1970.

(2) The Federal Government should stimulate more active participation by the States in planning and undertaking water development and management activities by setting up a 10-year programme of grants for water resources planning.

(3) The Federal Government should undertake a co-ordinated scientific research programme on water. This should include both research into ways to increase available supplies and ways to increase efficiency in the use of water. The Executive Branch should be requested to submit a programme of research to Congress in January 1962.

(4) The Federal Government should prepare biennially an assessment of the water-supply demand outlook for each of the water resource regions of the United States. The Executive Branch should be requested to submit a programme of research to Congress in January 1962.

(5) The Federal Government, in co-operation with the States, should encourage efficiency in water development and use, by regulating flood plain use, by studying and anticipating water problems, by anticipating storage needs, by increasing public awareness of water problems and by the provision of public hearings where necessary.

Water is to-day assuming an ever-increasing importance as civilization's needs for water and water-related products and services grow. Areas of the globe that will thrive, or even survive, will be determined by the availability of water resources and their wise use to serve man. Growing communities will need increasingly to organize and conserve these resources. Commendable foresight has been shown in the United States in the efforts being made to provide adequate water supplies for the next generation. Most countries, especially the United Kingdom and many members of the Commonwealth, will find the approach, the reports, the findings and the recommendations of the Senate Select Committee which have been considered here of great value and interest to them in dealing with their own water problems.

W. G. V. BALCHIN

FLORA EUROPÆA

THE second symposium of Flora Europæa was held during May 21–28, 1961, in Italy. It was divided into three parts, the first in Genoa, where five days were devoted to various papers and discussions, the second consisting of an excursion to Viareggio and the Apuane Alps, ending in Florence where the final sessions of the symposium were held in the Botanical Institute.

The meeting was attended by participants from Denmark, Switzerland, Sweden, Finland, Iceland, Poland, Portugal, Spain, Rumania, Germany, Yugoslavia, Belgium, France, Austria, Norway, as well as Italy and by all the members of the British Editorial Committee.

In Genoa the symposium was held in the University Botanical Institute, founded by the British philanthropist and merchant, Thomas Hanbury, whose name the Institute still bears. The Institute is situated high above the city, surrounded by its Botanic Garden, and made a very appropriate and comfortable meeting place. The arrangements were made by Prof. R. E. G. Pichi-Sermolli, director of the

Institute, with the co-operation of the University authorities.

The keynote of the meeting was international co-operation in European taxonomy, an appropriate theme for the Flora Europæa organization.

The opening session on Sunday morning included speeches of welcome by Prof. Pichi-Sermolli and University dignitaries, to which Prof. T. G. Tutin (Leicester, chairman of the Editorial Committee) replied in English and Prof. D. A. Webb (Dublin) in Italian. In the afternoon Prof. Tutin outlined the progress made by the Flora Europæa organization since the last meeting in Vienna. He recalled how the Editorial Committee had received a substantial grant from the Department of Scientific and Industrial Research, which enabled the secretariat to be established on a permanent basis and allowed the employment of two research assistants. The circulation of manuscripts of Volume 1 to the regional advisers had proceeded successfully during the past two years, and he discussed the three main points that had been raised by the advisers. These were distributional, ecological and cytological data. There had been great insistence on the importance of giving as detailed ecological information as possible, but in the discussion that followed Prof. Tutin's paper it was made quite clear that although some species have a fairly consistent general ecology there are many which show surprising exceptions or unexpected variation. None the less some advisers, such as Prof. R. Nordhagen (Oslo), felt that even such elementary information as whether a species grew in wet or dry habitats should be given. Prof. W. Lüdi (Zurich) suggested that certain generalized information could be given by using categorized types of ecological preferences which would be useful for non-taxonomists. It was eventually agreed that authors of accounts should attempt to summarize the ecological characteristics of the species in the manuscripts circulated to the regional advisers and these could then be criticized by them.

Dr. V. H. Heywood (Liverpool, secretary of the Editorial Committee) then gave a brief report on the state of preparation of Volume 1 of the *Flora*. The first manuscripts were sent out to regional advisers in December 1958. Since then 150 have been circulated and a further 50 have been prepared and are being revised by the Editorial Committee prior to circulation. Approximately two-thirds of the first volume have been completed and manuscripts of the remaining third are in active preparation. Furthermore, several authors are preparing accounts for the second volume and some have already been submitted. Since the Vienna meeting a supplement to the Green Book (*Guide to Contributors*) had been published[1], the Vienna Symposium report had appeared as a number of *Feddes Repertorium*[2] and the first of the *Flora Europæa Notulæ Systematicæ* were in the press[3].

The second day of the meeting was devoted to a consideration of post-war European taxonomic and floristic literature. Regional advisers were asked before the meeting to prepare reports on the situation in their countries, together with a bibliographical list of the more important papers published since 1945. Reports from 16 countries were received and duplicated copies were distributed to participants as a volume of some 250 pages.

Dr. Heywood gave an introductory analysis of these floristic reports, making the following points: It was interesting to note how frequently it was mentioned that taxonomic and floristic studies had been neglected in several countries since the War for one reason or another. Equally interesting were the reasons for renewal of activity in many cases. For example, phytosociological or topographic-distributional investigations (often undertaken for economic reasons) have given an impetus for much floristic work. There were dangers, however, attendant on this since it often involved cursory identification in the field subject to considerable errors. It was in fact true of certain regions that the only floristic information available had to be drawn from phytosociological lists. Another noteworthy feature was the lack of modern Floras in the Mediterranean region, precisely those areas with the greatest floristic diversity. In more northern countries the tendency was towards biosystematic studies. An unfortunate feature was the small number of monographs or revisions that were being prepared, a tendency which fits in with the world pattern.

The number of journals in which European taxonomic and floristic literature is published is about 500, which in itself presents problems, since few institutions regularly receive more than a proportion of them. As a result there is often considerable ignorance as to the activities of other taxonomists, with consequent duplication of effort in some cases. The solution to this kind of problem lies very largely in improving abstracting services, a subject which was discussed later. It was encouraging to note that several European journals or organizations already produce some sort of annual listing of relevant literature published in their country. Prof. Böcher (Copenhagen) suggested that it would be of great service to taxonomy if these annual reports could be united and circulated together. It was agreed to investigate the possibilities of doing this.

Brief surveys of post-war taxonomic activity were then given by Prof. T. W. Böcher (Copenhagen, for Denmark), Prof. F. Markgraf (Zürich, for Albania), Prof. R. Nordhagen (Oslo, for Norway), Dr. A. Lawalrée (Brussels, for Belgium), Prof. A. Borza (Cluj, for Rumania), Prof. K. H. Rechinger (Vienna, for Austria and Greece), Dr. N. Hylander (Uppsala, for Sweden), Prof. R. E. G. Pichi-Sermolli (Genoa, for Italy), Dr. S. M. Walters (Cambridge, for Great Britain), Prof. D. A. Webb (Dublin, for Ireland), Prof. B. Pawlowski (Cracow, for Poland), Prof. W. Lüdi (Zürich, for Switzerland), Dr. A. Löve (Montreal, for Iceland), Dr. Pinto da Silva (Sacavém, for Portugal), Prof. A. R. Merxmüller (Munich, for West Germany), Prof. W. Rothmaler (Griefswald, for East Germany), Prof. E. Guinea (Madrid, for Spain), Dr. P. Jovet (Paris, for France), and Prof. E. Mayer (Ljubljana, for Yugoslavia).

It is intended to publish revised versions of all these floristic reports in a special number of the journal *Webbia* in 1962.

On May 23, two papers were given on the Italian flora. Dr. G. Moggi (Florence) gave a survey of the state of floristic investigation in the southern half of Italy and in Sicily. It was a revelation to most participants to learn just how poorly large areas of southern Italy had been studied floristically, and it is hoped that Dr. Moggi's map illustrating this will be published with his paper as part of the *Proceedings of the Symposium*. The second paper was by Dr. S. Pignatti (Padua) on the taxonomy and relationship of the genus *Limonium* in Italy and Spain. This was followed by a lively discussion.

The following morning was devoted to considering the problems of abstracting and indexing European taxonomic literature. Dr. S. M. Walters (Cambridge) surveyed the major schemes of indexing and abstracting already in existence, such as the *Index Kewensis*, *Excerpta Botanica*, and national ones such as the *Plant Breeding Abstracts* published by the Commonwealth Bureau of Plant Breeding and Genetics, Cambridge, and certain private systems. All these have certain limitations such as incompleteness. The second question to be considered was how far they overlapped one another, and the third aspect covered was a consideration of how these facilities could be improved and modified. During the discussion attention was directed to several other abstracting systems that existed, and the regional advisers agreed to submit information on these to the Flora Europæa secretariat. The combined information would then be circulated.

A more long-term possibility of improving the abstracting facilities was discussed by Mr. S. Gould (Connecticut) who attended the meeting as an observer. He is working with a grant from the U.S. National Science Foundation, towards the setting up of an International Plant Index. The details of his methods, which involve the use of a punched card system, were explained and keenly discussed, and many participants agreed that the International Plant Index might form a useful basis which could be utilized for indexing European taxonomic literature. The possibilities of co-ordination would be further investigated and it was hoped that Mr. Gould's scheme would be successfully continued.

The next paper was by Dr. E. Weinert (Halle), who gave, on behalf of Prof. H. Meusel (Halle), who was unable to attend, examples of methods of indicating extra-European distributions for species in the text of *Flora Europæa*. The general principles employed in the examples were accepted, and Dr. Weinert said that the staff of Prof. Meusel's Institute would supply the necessary information for the whole of Volume 1, details in critical cases to be arranged with the authors of the accounts.

A problem related to the use of European taxonomic literature was reported on by Prof. D. A. Webb, who outlined progress that had been made in the preparation of a *Lexicon Polyglottum*. This was essentially a Latin-based list of about 200 terms commonly used in Floras with the equivalents in most European languages. A number of partial lists had already been prepared for immediate use and these had revealed a number of unexpected problems. It was, for example, impossible to find equivalents for certain terms in some languages. Also, terms may be used in different senses in some countries so that considerable problems of interpretation arise in producing the glossary.

The question of terminology was then discussed further by Prof. N. A. Burges (Liverpool), who outlined the problems he had come across in attempts to introduce some sort of standardization of terminology in the manuscripts of the first volume of the *Flora*. As might be expected, this generated a lively controversy over the use and application of technical terms. What several participants regarded as loose British usage of the term 'fruit' came in for considerable criticism and several minutes were devoted to discussing how the fruiting structures of *Ranunculus* and similar genera should be described. The discussion had to be terminated before it extended to detailed consideration of the whole botanical vocabulary. Prof. Burges suggested that the number of complicated terms used was to some extent correlated with the age and experience of the writers of the manuscripts, although there were exceptions, but this provocative issue was not pursued!

Alien plants was the first subject for discussion on May 25. Prof. Webb recalled the various suggestions that had been made at the Vienna Symposium concerning the treatment of aliens, notably by Dr. Hylander (Uppsala) and Prof. Jalas (Helsinki), and outlined the decisions made by the Editorial Committee. Several of the proposals, such as the distinction of casual species by a special sign, had been rejected on the grounds that the number of species involved would be too large, to say nothing of the difficulties of obtaining the necessary information. Similarly the proposal to include archæosynanthropes with native plants and the designation of only neosynanthropes as alien was rejected on the grounds of impracticability. Other proposals were however accepted, such as the inclusion of well-established aliens even if found only in one small district. Prof. Webb then went on to consider the terminology to be applied since there was considerable confusion in the literature. The term 'adventive', for example, is used in various senses. The terms proposed for use in *Flora Europæa* were: (1) cultivated or planted; (2) wild; (3) native; (4) alien; (5) established; (or naturalized) alien; (6) casual. Definitions of these were given, and regional advisers were invited to submit agreed equivalents in their own languages. Criteria for the inclusion of aliens in *Flora Europæa* were then discussed. Prof. Webb concluded with a call for information about: (*a*) botanists who take a special interest in alien plants and who could assist in assessing information about them according to the criteria agreed on; (*b*) literature references published since the appearance of the standard Flora of the country. This information was particularly urgent for a number of countries such as Albania, Corsica, Greece, Spain, Sardinia, Turkey-in-Europe, none of which possesses an adequate Flora less than twenty years old.

The next subject for discussion was again introduced by Prof. Webb. It concerned the need for the preparation of regional check-lists for *Flora Europæa*. In a number of regions the information available in existing Floras was not sufficient to establish the presence even of non-critical species. The compilation of lists for certain regions such as Albania (P. W. Ball, Liverpool), Turkey-in-Europe (D. A. Webb, Dublin), Spain (V. H. Heywood, Liverpool) was now in hand, but lists for such areas as Greek Macedonia and Thrace, and Yugoslav Macedonia were urgently needed. Another such area was Sardinia, and Prof. Pichi-Sermolli thought that it might be possible to organize a list.

The final session in Genoa was devoted to a consideration of hybrids in *Flora Europæa*, and the main paper was given by Prof. D. H. Valentine (Durham) who, after a theoretical introduction, surveyed the type of problems arising in genera such as *Rumex*, *Salix* and *Saxifraga* which occur in the first volume of the *Flora*. No major departure from the rules set out in the *Guide to Contributors* was proposed, although there were proposals for greater consistency in the designation of hybrids by formulæ and binomials.

In the discussion attention was directed to the necessity for careful investigation in groups where hybridization was known, since the hybrids often resembled one of the parents so closely that they were

not detected. The question of intergeneric hybrids was also discussed, particularly with reference to the Gramineae.

In Genoa both the University and the city authorities provided generous hospitality. A reception was held at the Palazzo Tursi by the Mayor of Genoa, and the participants had an opportunity of examining there some of the original correspondence of Christopher Columbus. An extensive tour of Genoa and the Riviera de Levante, including Santa Margherita Ligure and Portofino, was provided by the Tourist Organization. The meeting in Genoa ended with a banquet given by the University at Boccadasse. The festivity of this occasion was enhanced by several speeches, including one by Prof. A. Borza in Latin which received an ovation. Prof. Borza, the doyen of the botanists present, took the opportunity of announcing two new species he had discovered—*Tutinia gravis* and *Heywoodia agilis*. Since the eloquent Latin descriptions he gave were only verbal and were not therefore effectively published according to the *International Code of Nomenclature*, steps are being taken to remedy this through other channels.

The next two days were spent on a profitable and enjoyable field excursion—on May 26 to the nature reserve of Portofino, Passo del Bracco and the celebrated *Pinus pinea* forest at Migliarino, spending the night at Viareggio. On May 27 the excursion went inland to the marble mountains of the Apuane Alps, climbing to the peak of Monte Altissimo. Florence was reached by evening and the final sessions of the symposium were held the next day, May 28, in the Botanical Institute of the University. In the morning members were shown around the various sections of the Institute, including the newly constructed phytotron and the elegant and spacious herbaria and library. A reception was held in the library dominated by the bust of Philip Barker Webb, whose herbarium, together with the other major collections, make Florence one of the most important centres for taxonomic botany in Europe.

The closing session of the symposium was held in the afternoon when the main business was the report of the Nomenclature Sub-committee, given by the chairman, Dr. N. Hylander. Most of the discussion centred round the validity of publication of the species contained in such works as Gandoger's *Flora Europae*. It was decided to make further studies and arrive at an assessment of the number of species involved and the number of changes of name which they might cause before reaching a decision. It was also agreed to circulate lists of *nomina ambigua* to the members of Flora Europæa with the view of reaching agreement on which of these names should be rejected.

The meeting ended with speeches by Prof. Pichi-Sermolli and Prof. Lüdi. Prof. Borza expressed the hope that it would be possible to hold the next meeting in Rumania. The second Flora Europæa symposium was thus successfully concluded, and co-operation for the future firmly established.

V. H. HEYWOOD

[1] Heywood, V. H. (compiler), *The Presentation of Taxonomic Information, Supplement* (Alcobaça, 1960).
[2] Heywood, V. H. (edit.), *Feddes Repertorium*, **63**, Heft 2 (1960).
[3] Heywood, V. H. (edit.), *Feddes Repertorium*, **64**, Heft 1, 1 (1961).

EUROPEAN BROADCASTING CONFERENCE, STOCKHOLM

DURING May 26–June 23, a European conference on "Broadcasting" was held in Stockholm under the auspices of the International Telecommunication Union. The objects of the conference were: first, to revise the 1952 Agreement reached also at Stockholm for the use of the very high-frequency Bands I, II and III for sound and television broadcasting; and secondly, to prepare plans for the future development in the European area of sound broadcasting in Band II, and of television in the ultra-high frequency Bands IV and V. This year the conference was attended by delegates from some forty national administrations, and by representatives of a number of international organizations.

The conference was opened by Dr. Hakan Sterky, director-general of Swedish Telecommunications; and at the first meeting, Dr. E. Esping, technical director of Swedish Telecommunications, was appointed chairman, assisted as vice-chairmen by Captain C. F. Booth and Mr. A. Badalov, leaders of the United Kingdom and U.S.S.R. delegations, respectively.

The technical basis for this recent conference had been formulated in March at a meeting of technical experts of the International Radio Consultative Committee held in Cannes. A detailed report of this meeting provided full information on technical matters, such as the characteristics of transmitters and antenna systems, propagation curves for land and sea conditions, and the signal protection ratios requisite for satisfactory reception of television in the ultra-high-frequency bands from 470 Mc./s. upwards.

The final report adopted by the recent conference at Stockholm will await endorsement by the various national administrations represented. It contains full details of the stations proposed for sound and television broadcasting in the future. In particular, some five thousand stations are listed in the ultra-high-frequency Bands IV and V, together with the frequencies assigned to these stations to avoid mutual interference during operation. A uniform channel-width of 8 Mc./s. was proposed for each station, consistent with the adoption of the 625-line standard for the vision signals. In view of the rapid development of television throughout the world at the present time, it was very opportune that this conference was held so that satisfactory plans could be made on a sound technical basis.

One of the participating bodies at Stockholm was the Inter-Union Committee for the Allocation of Frequencies for Radioastronomy and Space Science, which was established by the International Council of Scientific Unions last year. This committee was represented by Drs. H. Sterky, and J. H. D. von der Toorn, by Prof. B. Linblad, and by Dr. R. L. Smith-Rose, secretary-general of the Committee; and it put forward two recommendations designed to protect observations made by radio astronomers in certain frequency bands. One of these sought to secure the free use of the band 606–614 Mc./s. for the radio astronomy service, and was received very sym-