



Eva Crane Trust

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## XVIII INTERNATIONAL BEEKEEPING CONGRESS

**MADRID, 25th-30th September, 1961**

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The decision to hold the XVIII International Beekeeping Congress in Spain was taken by the delegates to the meeting of Apimondia at the XVII Congress in Rome in 1958 [*Bee World* 39(12) : 311 (1958)]. To the rest of the world, Spain was almost an unknown country from the beekeeping point of view. Only one or two from Spain had attended previous Congresses, and not many beekeepers or bee scientists from other countries had visited Spain. Doña Maria Estremera de Cabezas, who had been at some of the Congresses, was the chief link, and she became the President on the present occasion.

The XVIII Congress was organized by the *Sindicato de Ganadería*, the 'Livestock Syndicate', a Government-aided body which looks after the interests of persons who raise livestock, whether cattle, sheep, goats, rabbits or bees. The Syndicate had many facilities to draw on, and had organized international meetings for other branches of livestock raising. The lack of contact with other beekeeping organizations and gatherings was well recognized by the Congress Committee, and one of its first moves was to press for the setting up of an international committee specifically to provide continuity in the organization of successive International Congresses, and to ensure that the experience gained at each Congress is made available to future ones.

The Congress in Madrid was not an extravagant or expensive one for its members, and the excellence of the food and service in general was much appreciated by visitors from countries where labour costs are now high: to them this was a glimpse into a past age, gone for ever at home. The social side of the Congress was very much enjoyed, and provided opportunities for seeing many places of interest. On the other hand, those who came to Madrid expecting the Congress to provide occasions and facilities for the serious discussion of recent scientific developments were greatly disappointed. Many international meetings have foundered because of unfamiliarity with rules of procedure in another country, and most Congress members found the Spanish practice bewildering in the extreme:

a nominated platform party [*mesa*] but no designated chairman, no machinery for timekeeping, and a programme which seemed to take little account of the time available, and was subject to frequent changes.

This was certainly the biggest Congress since the war, the number attending being variously reported between six and eight hundred. The customary list of members was not issued, but two facts at least were clear: there were very few from the socialist countries, but an increasing number from continents outside Europe.

All meetings were held in the same hall—an excellent one, with air conditioning, and with facilities for simultaneous translation. Considerable thanks are due to the team of translators; it is necessary also to recognize the fact that no translator can do *better* than the material he is offered, and that he cannot do justice to a technical script which he has not seen in advance, and which is read much too fast.

#### OPENING CEREMONIES

These took place on Monday morning, 25th September, with speeches by the President of the Congress, Sra. Da. Maria Estremera de Cabezas, by the President of the Livestock Syndicate, Sr. D. Manuel Mendoza Ruiz, and by Conte Dr. A. Zappi-Recordati, President of the last Congress. The assembly then migrated to the exhibition hall of the Casa Sindical, for the official opening of the beekeeping exhibition there (page 287).

#### PAPERS PRESENTED

A list of some of the papers on the programme is given below, classified under subject, as for the XVI Congress in *A.A.* 261/56. Not all these papers were read (see page 284).

#### GENERAL BEEKEEPING 638.1

*Carbonero Bravo, L.*; *Sepúlveda Gil, J. M.*; *Vinuesa, A. G. de* (Spain) Beekeeping in Spain (lectures)

*Aherne, A.* (Ireland) Beekeeping in the Republic of Ireland

*Carbonero, L.* (Spain) Spanish work in developing beekeeping in Morocco

*Martínez Cancio, R.* (Argentina) Beekeeping in the Republic of Argentina

*Smith, F. G.* (Tanganyika) A Beekeeping Research Institute for Africa

#### HISTORY OF BEEKEEPING 638.1(091)

*Jaime Gomez, J.* (Spain) The contribution of classical Spanish authors to world beekeeping

*Jaime Gomez, J.* & *Loren de Jaime, R.* (Spain) Spanish bibliography of beekeeping

*Porcar, J. B.* (Spain) Votive apiaries in rock paintings in eastern Spain

#### BEEKEEPING EDUCATION 638.1 : 37

*Carbonero, L.* (Spain) The General Livestock Administration and beekeeping education in Spain

*Carretero, F.* (Spain) The need for beekeeping education in primary schools

*García Díaz, E.* (Spain) The need for adequate rural beekeeping instruction

*Martínez Cancio, R.* (Argentina) Formation of beekeeping clubs for children in elementary schools

*Romero Fuertes, L.* (Spain) The importance of school beekeeping

#### HONEYBEES (QUEEN) 638.121.1

*Butler, C. G.* (Britain) Discovery, identification and synthesis of queen substance, and its importance in beekeeping

*Feely, L.* (Ireland) Frequency of mating as a factor limiting the fertility of queen bees in Ireland

*Filipović-Moskovljević, V.* (Yugoslavia) The role of the queen in the colony

*Morse, R. A.* (U.S.A.) The function of mandibular glands of the queen honeybee and their influence on the social structure of the honeybee colony

#### HONEYBEES (WORKERS) 638.121.2

*Anderson, R. H.* (South Africa) The development of the laying worker in the Cape honeybee (*Apis mellifera capensis* Esch.)

*Carranza Guzmán, J.* (Spain) Contribution to the study of the tongue length of Spanish bees

*Filipović-Moskovljević, V.* (Yugoslavia) The state of development of pharyngeal glands of the worker honeybee in the normal colony

*Jean-Prost, P.* (France) Behaviour of laying workers

*Skrobel, D.* (Czechoslovakia) Some results on the respiratory metabolism of the bee

*Wallon, H.* (Belgium) Sexoclasine: relation between the sex of larvae and floral reproductive organs

*Wittekindt, E.* (D.B.R.) Comparative experiments on the dance behaviour of free-flying bees and bees confined to the hive

*Wittekindt, W.* (D.B.R.) Observations on the dances of young bees which have not flown

#### HONEYBEES (RACES) 638.123

*Ruttner, F.* (Austria) Races of bees (lecture)

*Adam, Brother* (Britain) Bees of the Iberian Peninsula

*Costa Cruz, C. da* (Brazil) Evolution of certain characteristics of the genus *Apis*

*Haccour, P.* (Morocco) The Sahara bee

*Smith, F. G.* (Tanganyika) The races of honeybees in Africa

#### BEE FORAGE 638.13

*Pritsch, G.* (D.D.R.) Bee plants (lecture)

*Haragsim, O.* (Czechoslovakia) Contribution to the chromatography of honeydew

*Percival, M.* (Britain) Types of nectar in flowers

*Rihar, J.* (Yugoslavia) New methods for a better exploitation of conifer honeydew

*Wellenstein, G.* (D.B.R.) Four years' investigation on increasing the flow for bees in forests

Experiments to ascertain the importance of the red wood ant in the beekeeping economy

#### BEEKEEPING METHODS 638.14

*Brotóns Iborra, J. M.* (Spain) The advantage of wintering many colonies in areas with a good climate and an early main flow

Three-queen colonies without danger of swarming

*Elser, E.* (Switzerland) Result of feeding minerals in sugar syrup

*García Palazuelos, B.* (Spain) Artificial incubation of bee brood

*Glushkov, N. M.* (U.S.S.R.) Increasing honey production by improvement of feeding conditions of the larvae (by increasing the cell size)

*Gorostidi e Imaz, A.* (Spain) Hive scales in the apiary

*Haccour, P.* (Morocco) The largest collective apiary in the world

*Kaaser, W.* (D.B.R.) Biology and beekeeping techniques

*Ketter, H.* (D.D.R.) Analysis of changes in hive weight . . .

*Susaeta, M. L.* (Chile) Experiments with superimposed colonies in a region with an early flow

#### BEE BREEDING AND REARING 638.145

*Blum, R.* (Israel) A solution to the difficulties of mating queens in temperate zones and increasing honey yields

*Roma Fabrega, A.* (Spain) Method for producing royal jelly in large quantities

*Salvia Pardo, A.* (Spain) Attempt to improve certain races of bees

*Sklenar, H. Weber* (Austria) Safe introduction of a queen of a different race: formation of an artificial swarm outside the hive

#### BEE DISEASES 638.15

*Goetze, G.* (D.B.R.) Bee diseases (lecture)

*Broeker, W.* (D.B.R.) New knowledge on the origin of 'black disease' in bees

#### ACARINE 638.153.2

*Felling, O.* (D.B.R.) Acarine control in Hesse

*Romero Fabre, P.* (Spain) Appearance and spread of acarine disease in Spain

*Sepúlveda Gil, J. M.* (Spain) Distribution of acarine disease in the province of Málaga

Resistance to acarine disease

- NOSEMA 638.153.3**  
*Doull, K. M.* (Australia) Development of epidemic nosema  
*Garcia de Vinuesa, A.* (Spain) Incidence of nosema disease in Spain  
*Valin, J.* (France) Experiments on the development and treatment of nosema disease
- FOUL BROOD 638.154.3**  
*Haragsimova-Neprasova, L.* (Czechoslovakia) A.F.B. and antibiotics from higher plants  
*Ortego Frias, F.* (Spain) Effects of antibiotics on foul brood
- FUNGAL DISEASES 638.154.4**  
*Tabarly, O.* (France) Fungal diseases of bees
- BEE ENEMIES 638.157**  
*Ruperez Cuellar, A.* (Spain) Attempt at microbiological control of wax moth larvae (*Galleria mellonella*)
- BEE POISONING 638.158**  
*Todd, F. E.* (U.S.A.) Insecticides and poisoning (lecture)  
*Svoboda, J.* (Czechoslovakia) Strontium 90 in bees and their products
- HONEY 638.16**  
*Willson, R. B.* (U.S.A.) Commercialization of honey (lecture)  
*Aphandéry, A.* (France) Increasing the production and consumption of honey  
*Borneck, R.* (France) Rationalizing the honey trade  
*Valin, J.* (France) Chemical investigation of honey
- BEESWAX 638.171**  
*Ibercas* (Spain) Beeswax trade
- OTHER BEE PRODUCTS 638.178**  
*Caillas, A.* (France) Hive products (lecture)  
*Belvefer, B. de* (France) Histology of the suprarenal glands of mice treated with high doses of royal jelly  
     Biology of the lipoid fraction of royal jelly  
*Cocci, C.* (Italy) Comparative study of the application of royal jelly and amino acids on internal secretory glands  
*Gautrelet, M. & Belvefer, B. de* (France) Effect of a preparation of bee brood on compensated renal hypertrophy in the rat  
*Poggioli, A.* (Italy) An 'antitoxic factor' exists in royal jelly  
     Increase in the regenerative action on cutaneous tissue of 'irradiated' royal jelly  
*Willson, R. B.* (U.S.A.) Research on royal jelly in North America 1953-1961
- BEES AS POLLINATORS 638.19**  
*Sacchi, R.* (Italy) Pollination (lecture)  
*Barbier, D. E. U.* (France) Pollination of *Lavandula vera* and its effect on yield and quantity of lavender oil  
*Bulanek, F.* (Czechoslovakia) A formula for the economic value of bee pollination of crops  
*Free, J. B.* (Britain) Pollination of fruit by bees  
*Wafa, A. K. & Ibrahim, S. H.* (Egypt) The effect of bees in pollinating citrus

A book containing Spanish summaries of the above papers and of others (many of whose authors did not attend the Congress) was available in Madrid. A book containing the full Russian text of twenty-six papers from the U.S.S.R. had been published in Moscow; these had only a nominal connection with the Congress, however, since only one of the authors (Professor N. M. Glushkov) was present. Duplicated lists of contributions to some of the sessions were prepared during the Congress, but again, not all of these contributions were read. In general, such programmes as were available bore little relation to what actually took place.

This was all a very great pity. While some contributions would hardly have found a place in a local beekeepers' meeting in many other countries,

a number were real contributions to the advancement of beekeeping and bee research. Most previous Congresses have been criticized on the grounds of lack of selection of papers, and the present one has shown clearly that unless adequate steps are taken in this direction, most of those offering worthwhile scientific papers will be forced by the conditions of their own employment to present them elsewhere, at meetings where an adequate standard is maintained. It is to the great advantage of both bee research and beekeeping that there should be close and constant contact between science and practice, and if necessary the most strenuous efforts should be made to ensure this contact. But the time is long past when most of the scientific progress was made by practical beekeepers. Science is advancing on so many fronts, and the honeybee is such a useful experimental animal, that scientists in widely different fields, who have no special obligations to the beekeeping industry, are carrying out research on bees. Some of this research will prove to be of value to beekeepers, and to those concerned with bee products. It would therefore be to the advantage of beekeeping to seek to attract such scientists to Beekeeping Congresses, as well as those more directly concerned with beekeeping itself.

It is not intended to publish abstracts of all separate Congress communications in *Apicultural Abstracts*. A few points from some of them, which describe work not already abstracted or dealt with elsewhere in *Bee World*, are therefore included here.

Papers by G. Wellenstein (D.B.R.) dealt with the increasing importance of forests as a source of (honeydew) honey, especially the coniferous forests which are kept under rather strictly controlled conditions, and where colonies of wood ants are encouraged (these stimulate honeydew production by the aphids). In south-west Germany in 1958 and 1959, from mid-June to the end of August, honey yields from colonies in the fields, in woods with few ants, and in woods with many ants, were in the ratio 1 : 1.6 : 2.4.

Dr. Mary Percival (Britain) reported on her work in classifying the nectar of 893 plants, according to the sugar contents determined by paper chromatography. A broad division can be made into three types: dominant sucrose, 'balanced' (sucrose = fructose = glucose), and dominant fructose-glucose. The first type seems to be associated with long-corolla flowers having protected nectar, and the third with open flowers having unprotected nectar. Whereas many flowers frequented by honeybees, bumble bees, butterflies and moths have nectars of the first two types, the climax groups of Cruciferae, Umbelliferae, a section of Compositae, the Euphorbiales and the herbaceous Rosaceae have a completely broken-down nectar, with equal parts of glucose and fructose — similar proportions to that in honey. In 828 of the species examined the nectar composition appeared constant, but in another 61 it varied distinctly, and in a way not apparently associated with locality or date of sampling.

Among the papers dealing with queen honeybees, those by Dr. C. G. Butler (Britain) and Dr. R. A. Morse (U.S.A.) made it clear that the queen substance story is much more complicated than was at one time thought. Dr. Morse found that the removal of the mandibular glands from queens did not completely, nor permanently, inhibit queen-cell production in their colonies. Dr. Butler reported similarly that synthetic queen substance did not give complete inhibition, a second factor which works synergically with queen substance being involved; the two together give complete

inhibition of queen rearing. Dr. R. H. Anderson, from South Africa, reported on his preliminary work on the Cape bee (*A. m. capensis*), which has the peculiarity that queens are commonly produced parthenogenetically from eggs of laying workers. This characteristic, which has been little studied in recent years, is now being investigated in the light of current knowledge. It seems clear that, here also, something besides queen substance is involved, and that this supplementary substance comes from workers and/or eggs and/or young brood.

Luke Feely, in an attempt to find the reason for the low fertility of queens in Ireland, examined the spermathecae of queens mated in Ireland, Italy and America. The average numbers of sperm were 4.29, 6.75 and 5.44 million respectively. Most of the Irish queens were in the medium or low range of the frequency distribution (1-5 million), and most of the American and Italian were in the medium or high range (5-9 million). It seems therefore that many Irish queens, mating in an unfavourable climate, do not receive an adequate complement of sperm. With their consequent low fertility, there is also a tendency to excessive drone production, perhaps as a compensating factor.

Robert Blum (Israel) put forward a plan which may well be impracticable, but which in theory might overcome the Irish difficulty. It consists in sending queens from unfavourable climates, to mate in countries where flying conditions are permanently good. Any such scheme would be beset by difficulties associated with possible disease transmission, and many countries already have legislation against imports of bees for just this reason.

In his introductory lecture on bee diseases, Professor G. Goetze (D.B.R.) made a vigorous plea for a world-wide attack on bee diseases, and especially for an enlightened conception of nosema as a parasite always present, but made active by untoward conditions, many of which could be eliminated by better beekeeping practice. A report on the incidence of nosema disease in Spain, by Antonia Garcia de Vinuesa, the daughter of the Congress Secretary, again gave a picture of a disease associated with poor beekeeping conditions. A. Valin (France) reported that infected colonies, moved to an area where nosema was absent, themselves became healthy.

The topical question of the possibility of toxic effects due to the presence of strontium 90 in pollen and nectar, and therefore in bees and honey, was discussed by Dr. J. Svoboda (Czechoslovakia). He suggested also that colonies of bees might be used for estimating fall-out in the neighbourhood of nuclear reactors.

#### OTHER MEETINGS

The International Beekeeping Congresses are the focal point for meetings of the ever-increasing number of organizations with members in different countries, and the Committee of this Congress was most hospitable in offering facilities for such meetings.

The Commission for Bee Pathology, a section of the International Office of Epizootics, held a two-day meeting before the Congress, with sessions on European foul brood, Bee poisoning, Septicaemia and Acarine disease, and summaries of these were presented to the Congress.

Other meetings included the Council of the Bee Research Association, a general meeting for members of the B.R.A., and the Committee for the

six member countries of the Common Market. Unfortunately no provision was made in the programme for the usual meeting of editors of beekeeping journals, and this was therefore not held.

#### APIMONDIA MEETING

The Apimondia meeting took place on the last day, and it followed what has become the customary pattern. The Secretary-General, Conte Dr. A. Zappi-Recordati, who conducted the meeting, reported on his work since 1958. Among the resolutions passed was one relating to an international committee specifically for the Congresses, on the lines which had been suggested (page 281). Delegates from twenty-one member countries voted for the place of the next Congress; the choice lay between Belgium, Czechoslovakia and Rumania, all of which had sent invitations, and the final choice was for Czechoslovakia. The time interval between Congresses was once again debated, and once again the previous decision was reversed, so the interval will be two instead of three years. The XIX International Beekeeping Congress will therefore be in Prague in 1963.

#### BEEKEEPING EXHIBITION

This was housed in the special exhibition hall of the Casa Sindical, and was an excellent feature of the Congress. A series of exhibits was very competently staged by Spanish honey producers and manufacturers of beekeeping equipment. The quality of the honey and beeswax, and the bold methods used for displaying them, won high praise from many visitors from other countries. A wide variety of containers was used for honey — of glass, pottery and plastic — and some were most attractive. No particular attention seemed to be paid to airtightness, as in countries with a high atmospheric humidity, and this in itself opens up a much wider field of choice. There were ample opportunities for tasting the various honeys, and for seeing some of the Spanish beekeeping equipment. The centre piece of the exhibition was a fountain of honey, which will almost certainly be copied in many other countries.

#### EXHIBITION AT THE NATIONAL LIBRARY

The important part played by Spain in the history of beekeeping was exemplified by a special exhibition in the *Biblioteca Nacional*. The exhibition was arranged by J. Jaime Gomez and his wife Rita Loren de Jaime, who also prepared the printed *Catalogo de la Exposición de Bibliografía Apícola*, a copy of which was given to each Congress Member.

The first part of the exhibition was devoted to works of importance in classical beekeeping. It included the Spanish translation of the Arabic book on agriculture written in Sevilla in the eleventh century by Abu Zacaria, also known as Ibn al Awam [see *Bee World* 13 : 129 (1932)]. The beekeeping section shows the Moors of that time to be comparatively advanced in their knowledge and their methods. (In Spain one is inclined to regard the Moors as the infidel enemy from whom the country was finally liberated by the Catholic Monarchs; it is salutary to remember also their great gifts to culture and learning, and that the survival of the philosophy of Aristotle was due to Moorish universities in Spain.) The Moorish type of apiary in Spain was similar in principle to that used from prehistoric times along the coast of northern Africa. It consisted of a wall

(commonly of rubble and mortar) about a yard [metre] thick, through which ran a large number of horizontal pipes, known as *hornos* or *hornales*, which formed the hives. These were closed at each end by a circular piece of stone. Although Zaragoza in northern Spain was finally recaptured from the Moors in 1118, these Moorish bee walls still survive in the neighbourhood, and can be seen in use there. They offer a striking contrast to the *Spanish* type of primitive apiary, consisting of upright hives of cork.

The exhibition also included the 1586 copy of the *Tractado breve de la cultivación y cura de las colmenas* by Luys Méndez de Torres, which contains the first published description of the queen bee as a female and laying eggs. The number and variety of ordinances exhibited, from the reign of Alphonso X onwards, showed the importance attached to bee-keeping as an occupation, and to honey and beeswax as commodities, throughout past centuries.

The collection of more recent books and journals included with the Spanish items a number of Spanish translations of textbooks written in other languages.

#### INTERNATIONAL FILM FESTIVAL

The films entered for the II International Festival of Beekeeping Film Documentaries were shown in the main Congress hall, and there was no

Title	Entered by	Colour	Width length	Date
Honig—köstliche Gabe der Bienen [Honey—precious gift of the bees]	Deutscher Imkerbund Germany (D.B.R.)	B/W	16 mm. 420 m.	1960
Heideimkereei [Heather beekeeping]	Deutscher Imkerbund Germany (D.B.R.)	B/W	16 mm. 540 m.	1961
Lebenswichtige Tänze im Bienenstock [Vital dances in the hive]	Dr. W. Wittekindt & E. Geerinckx Belgium	C	16 mm.*	1961
[The hornet appears on the scene]	Dr. J. Svoboda Czechoslovakia	C	35 mm. 440 m.	1961
[The free earth]	Dr. J. Svoboda Czechoslovakia	C	35 mm. 600 m.	1961
Beginning beekeeping	J. D. Haynie U.S.A.	C	16 mm. 500 m.	1960
Citrus honey production	J. D. Haynie U.S.A.	C	16 mm. 500 m.	1960
4H beekeeping demonstration	W. A. Stephen U.S.A.	B/W	16 mm. 400 m.	1960
[Bees and crops]	Prof. N. M. Glushkov U.S.S.R.	C	35 mm. 1200 m.	1960
Abejas y colmenas [Bees and hives]	Marques de Villalcazar Spain	B/W	35 mm. 600 m.	1955

\* magnetic sound track; for all the other films it is optical.

long journey such as there had been through Rome in order to see the films. Even so, many who wished to see films failed to do so, because they had no information as to what would be shown, and the periods allocated to films were often used for other purposes.

The list of films opposite has been kindly provided by the Congress Secretary, Sr. A. G. de Vinuesa y Rodriguez, whom I should like to thank warmly for this and many other courtesies.

The first prize was won by the Russian film 'Bees and crops'; it was presented during the closing session of the Congress, along with the other prizes, cups and medals.

#### THE REST OF THE PROGRAMME

Friday was devoted to a whole-day excursion to Toledo, the ancient capital of Spain on the river Tagus forty miles south-west of Madrid. This was most competently organized by the firm Viajes Marsans, and the many coach parties, each with a guide who spoke the relevant language, were taken in different sequences to the places of greatest interest: the magnificent cathedral; the church of Santo Tomé with its famous painting by El Greco of the burial of the Count of Orgaz; El Greco's house, now a museum; the Synagogue; and the ruined Alcázar, whose siege in 1936 was a turning-point in the Civil War. All this was in a small medieval town with streets designed for donkeys and pedestrians rather than modern wheeled traffic. After lunch — again a masterpiece of organization — we visited an agricultural college in the neighbourhood, and those who were persistent enough also walked and slid along two kilometres of muddy lane to see an apiary, the only one most of us saw in Spain. The most productive beekeeping area is round Valencia on the Mediterranean coast; Madrid is on a high, barren plateau which is not good bee country, but there are apiaries in the neighbourhood, and opportunities to visit them would have been widely appreciated.

The receptions in Madrid were magnificent. On Tuesday evening the Agronomic Research Institute [*Instituto Nacional de Investigaciones Agronómicas*], just beyond the great University City, entertained the whole Congress in the gardens which surround the institute, floodlit for the occasion. On Thursday evening the Mayor of Madrid received the Congress in the Gardens of Cecilio Rodríguez, situated in one of Madrid's extensive parks. Because of rain, the reception was held in the garden pavilion, and here students entertained us with songs and music.

The final Congress Banquet, held in the Palace Hotel at 10 p.m. on Saturday, was of a very high standard indeed: excellent food and wines, perfect service, and an air-conditioned room with no suggestion of overcrowding. Then, instead of spending an hour or more listening to speeches, we were given the opportunity of seeing Flamenco dancing in a nearby café. So the Congress ended. The official closing ceremonies had taken place in the afternoon; during them the President, Doña Maria Estremera, was invested with the Cross of the Order of Cisneros, a Spanish decoration for service to the State.

The 'Ladies' had their own programme, as has become customary, which enabled them (and others temporarily metamorphosed into Ladies) to see more of Madrid and its surroundings.

Apart from the many valuable contacts made at the International Congresses, each of them affords an opportunity to widen our knowledge of beekeeping and all that is associated with it, scientifically and culturally, in the host country. Since relatively little was previously known about Spain in these respects, it may be useful to add a few notes here. Brother Adam, in his accounts of the bees of the Iberian peninsula [*Bee World* 42 : 123-131, 252-255 (1961)], emphasizes the extremes of climate and soil, and the consequent wide variety of bee forage and of beekeeping conditions in the different parts of the country.

Only two-thirds of the hives in Spain are modern ones with movable combs; most of the fixed-comb hives are of cork, which is cheap, easy to make up, and an excellent thermal insulator. In the process of changing from fixed- to movable-comb hives, Spain is therefore at the stage some other western European countries passed through before the end of the last century. There are large commercial apiaries of modern hives in Spain, but these do not use the intensive methods of beekeeping which elsewhere have constituted the next important development after the first potentialities of movable-comb beekeeping have been explored. The communications to the Congress from Spain itself give the impression of a stage of development — and an attitude of mind — now long past in many countries. In beekeeping, as doubtless in other fields, Spain is suffering from her long isolation, which has hindered participation in advances made in other parts of the world.

It is therefore not surprising that there is no organization for bee research in Spain. When I was in Madrid in the spring of 1960, it seemed possible that a bee research department might be created within the Institute of Veterinary Research, which is part of the Veterinary Faculty of the University, but this scheme has not so far materialized. At present beekeeping comes entirely under the Veterinary Service, and State support is directed towards two main aims : elementary beekeeping education in schools and agricultural colleges, and disease control.

At present there are some 1 200 000 colonies in Spain, an average of  $6\frac{1}{2}$  to the square mile, nearly twice as dense a population as in England. The climate and flora seem suitable for a considerable expansion on several fronts: honey production, queen breeding and rearing, and the production of bees for sale. But it is not easy to see how such an expansion could be realized, even if the beekeeping industry were rationalized by applying methods which have proved their worth elsewhere. Expansion would only be possible if markets were available, and in present circumstances these must almost certainly be export markets. Spain is already one of the few European countries which produces a large surplus of honey, and the price of honey in Spain itself is very low indeed, often no higher than the price of sugar, in spite of the high quality of much of it. If Spain could build up a good export market for her bee products, many other benefits might follow. One development which may lead the way is an organization selling honey (mostly for export) under the name 'Mielapicas'. It was set up in 1957 by beekeepers at Castellón de la Plana, in the orange-growing district north of Valencia, and at present includes 384 beekeepers, producing 700 tons of honey a year.

Whatever the future holds for Spain, she has a proud history, in beekeeping as in other fields. It was in Spain that the earliest known record of beekeeping was made — the palaeolithic painting made about 6 – 7000 B.C. on a rock face in the mountains behind Valencia. It was in Spain that the Moors 'built the shining bridge which spans the Dark Ages', handing on to the rest of Europe the learning of ancient Greece, including what was known about bees. It was from Spain that Columbus sailed in 1492, discovering a whole new continent for colonization by honeybees, as well as by settlers, from Europe. And it was in Spain, nearly a hundred years later, that Méndez de Torres (see page 288) first put on record the most fundamental discovery in the whole of bee research.

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