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## Die Entwicklung der Weltbienenzucht

### Centenary of Cologne Beekeepers' Association

17 April 1982

First of all, I want to tell you how very pleased I am to be present at the Centenary Meeting of the Bienenzuchtvereins Grossköln, I regard it as a great honor<sup>to</sup> to be asked to lecture to you, and the fact that Brother Adam is also here adds to my pleasure. This is not the first occasion on which the Adam and Eva team have visited Germany together; we did so at Stuttgart in 1975<sup>1/2</sup>.

As you know, Cologne is associated with a beekeeping enterprise even older than the Beekeepers' Association. Die Rheinische Bienenzeitung was started in 1849 as a Veriens-Blatt, and as far as I know<sup>it</sup> is the oldest beekeeping journal in the world that has been published continuously since its creation, now under the name Die Biene. When I first visited Cologne, in 1951, the journal was edited by Frau Kötz-Körner who lived here, and she very kindly looked after me, and Miss Bindley who was with me. ~~We all had~~ <sup>None of us</sup> ~~had much~~ very little money in those days, and I remember that we spent the night in a students' hostel occupying ~~a disused wing~~ <sup>part</sup> of a Benedictine nunnery: there were 50 nuns, of whom only five ever went outside the walls, ~~their function being to maintain perpetual prayer in the chapel.~~ The accommodation you have provided me with on this visit is a far cry from the simple cubicles we slept in on that occasion. Nevertheless we enjoyed ourselves then, and I remember especially a Roman mosaic discovered close to the cathedral, when foundations were laid for an air-raid shelter.

The subject of my talk today is Die Entwicklung der Weltbienenzucht.

I have been fortunate enough to travel on beekeeping business in quite a number of countries, and I want to share with you some of the interesting things I have found, that you may not hear about from other people. [Bee-

keeping proper was preceded by honey hunting, and this was an activity that

~~I am sure~~ <sup>Certainly</sup> preceded the existence of man. Various higher primates take honey combs from bees' nests: baboons adopt quite elaborate measures to try to rid the honey combs of bees, and chimpanzees will poke a long stick down the hole that leads to a bee's nest, and withdraw it coated with honey. Honey hunting by primitive man was a continuation of much earlier animal behaviour: robbing bees' nests, devising a way of getting the comb partially free from bees, and using a tool to extract the honey from the nest. This same action is referred to in the Book of Samuel in the Old Testament (1 Samual 14: 25-27): "There was honeycomb in the countryside ... Jonathan ... stretched out the stick that was in his hand, dipped the end of it in the honey comb, put it to his mouth and was refreshed".

The earliest known record (1) of this interaction between man and bees is a ~~rock~~ <sup>in a rock shelter</sup> painting at Bicorp in eastern Spain. A honey collector, with a bag to put the honey combs in, is shown at a bees' nest at the top of a rope ladder. There is another person much lower down on the ladder; a good many people say that it is a man lower down, instructing his wife how to do the more arduous job with the bees, but we cannot really say that this is so.

This honey collecting scene was painted around 6000 BC, not so very long after the end of the Ice Ages. Another painting at Barranc Fondo in the same region (2) shows four people climbing up a ladder towards a bees' nest, with a fifth near the bottom, falling off it. There is a group of people standing near the foot of the ladder, and although we cannot be sure,

I think this may exemplify the social character of honey hunting. Honey was a treasure much sought after, and when it was found the honey was shared among the members of the group to which the honey hunters belonged.

Turning again to the Old Testament, in Judges 14: 8-9 it is said of Samson: "He turned aside to look at the carcass<sup>ass</sup> of the lion and saw a swarm of bees in it, and honey. He scraped the honey into his hands and went on, eating as he went. When he came to his father and mother, he gave them some, and they ate it". This is a typical description of the behaviour of African tribes that still collect honey by hunting wild bees' nests.

Coming now to beekeeping proper - that is the keeping of bees in hives (receptacles made specifically for the purpose), all our earliest records are in the form of pictures in Ancient Egypt. There are four of them, dating from 2500 BC to 600 BC, and they provide a rich source of information for so early a period. <sup>We know of no other pictures until</sup> ~~It is another 1500 years before the next pictures~~ <sup>later.</sup> ~~of beekeeping are available - the Exultet Rolls in Italy.~~

I have visited two of the tombs in Upper Egypt which contain beekeeping illustrations. One is in Valley of the Nobles, on the west bank of the Nile opposite Luxor, and not far from the tomb of Tutenkamen<sup>4</sup>. The man buried here, Rekmire, was a high court official around 1500 BC. The colours in the tomb painting are still fresh, and the pictures lively (3). On the right are three horizontal hives, stacked up vertically. The fact that they are painted grey indicates that they were made of mud, or unbaked clay. A kneeling beekeeper is taking combs from one of the hives, and his partner is holding what is probably a smoker, shown above the beekeeper. Just below the beekeeper's hands is a dish containing <sup>honey</sup> combs that have already been removed.

On the left of the beekeeper some other workmen are putting honey into large containers of baked clay (we know this because they are shown terracotta colour)(4). To the left again, another pair of workers are putting honey into a smaller shallow <sup>dish</sup> ~~container~~, of which there are several others farther to the left again. The men appear to be sealing <sup>a lid on to</sup> ~~the edge between~~ the <sup>dish</sup> ~~two containers~~.



I did not see any such <sup>dish</sup> ~~containers~~ in present-day Egypt, but two years ago I visited Kashmir, a valley in the Himalayas that received most of its cultural influences from the Middle East. In a beekeeper's house there, I saw the terracotta dish shown in the next slide (5). I asked him what it was used for; was it for feeding bees? "No", he said, "we use it for packing our honey combs and sending them to the market; we use two of the dishes (6), one upside down to make a lid over the other, We seal the edges round with mud." So here is a custom that has survived for three and a half thousand years unchanged; I measured the vessels painted in the Egyptian tomb, and those in Kashmir, and their proportions are identical.

The other Egyptian tomb I visited was a later one, but in the same area; it was near the temple of Queen Hatchepsut (7). Here a nobleman Pabesa was buried about 600 BC. The tomb <sup>was</sup> ~~had been~~ sealed <sup>up,</sup> and its entrance blocked with stones. I managed to get an official to open it, and the stones sufficiently removed to climb over them (8). In a little courtyard leading to the tomb itself, there were a number of pillars ~~round the edge,~~ on one of which is a beekeeping scene (9). The beekeeper is kneeling, in a somewhat similar position to that in the earlier tomb. Eight hives are stacked one above the other, and they are shown in a much less stylized, and possibly more accurate, way. Also, there are bees flying on the far side of the hives from the beekeeper (10), and the stack of hives protects him from them. It is a pity that part of the scene on the right has disappeared because the pillar is damaged - I was told by soldiers of Alexander the Great.

In Middle and Upper Egypt beekeeping still continues in a style somewhat similar to that shown in these ancient tombs. In Middle Egypt (11), near Assyut, I travelled along the road through a district that is famous for its beekeeping. I estimated the numbers of stacks of hives (12) along a distance of 50 kilometres along the road. The total came to the astonishing number of <sup>15</sup> 20 000. Each stack consists of several hundred hives (13), and Each hive is a long cylinder of unbaked mud; The little white marks are not orientation marks for the bees, but the beekeeper's record as to the condition of the colony inside. These bees are *Apis mellifica lamareckii*; they build smallish colonies and are not very nice to handle.

~~In another part of Middle Egypt~~ (14) I watched a beekeeper opening a hive in one of these stacks, from the back, as was done in the tomb paintings. The honey combs are ~~extracted thus, by cutting them out,~~ <sup>from the back of the hive,</sup> and also the bees are fed if necessary; just above (and to the right of) the beekeeper's hand you can see a shallow dish, inside a hive, that has been used for feeding. In <sup>another</sup> ~~this~~ apiary (15), in the Nile Delta, are some hives under a shelter, with the front ends open, and in one you can see how the combs are positioned. The beekeepers, in fact, carry out a sort of movable-comb beekeeping even with these primitive hives. When a new swarm is put into a hive, the hive is baited with two or three combs fixed across the hive (16) with a little forked twig, at the appropriate distance apart. The beekeeper is thus able to ensure that the bees build their combs across, and not along, the hive. When he wants to examine the brood nest, which is near the front of the hive, he <sup>opens</sup> ~~removes~~ <sup>hive from the front,</sup> the front lid, cuts out a comb at a time with a special knife, and refixes each comb in the right place with a similar little twig. The bees do not in fact attach a comb so liberally to the hive walls after it has been cut out and replaced, and the combs become easier to remove.

I do not think we shall ever know whether this form of movable-comb beekeeping was practised in Ancient Egypt, but there is certainly evidence (17) (from the earlier tomb painting I showed you) that combs were built across the hive; the removed combs in the dish are certainly shown as having a round shape.

A somewhat similar situation exists in Crete, where the beekeepers use baked clay clinders for hives (18); they also remove and replace the combs. Whether this was inherited directly from Egypt, or developed independently, I do not know. For several reasons I think it likely that the custom was an Egyptian one, subsequently adopted also in Crete.

From Crete, <sup>very good</sup> cultural diffusion spread many customs to mainland Greece. We have <sup>one kind of</sup> direct evidence about ~~the~~ hives used in Ancient Greece, because a number of them have been excavated (19). They were thimble-shaped - like horizontal cylinders with one end closed. [Several Greek writers wrote books about beekeeping; these books were all destroyed, but we know of them through references from Roman writers. These <sup>Roman</sup> ~~authors~~ wrote quite a lot about beekeeping methods, and described their hives - but no illustrations of them survive. We learn from these writings that their hives followed the general style of the Ancient Egyptian ones: they were horizontal, mostly cylindrical, but sometimes square. This shape of hive is, so to speak, the world prototype, and is still found today in traditional beekeeping in the whole of Africa, the whole of Asia except the far north, and in tropical America where horizontal log hives were used for stingless bees.]

Almost the only part of the world where these horizontal hives were not the norm was in Europe north of the Alps. You will have heard from Professor Ruttner and others a great deal about the forest beekeeping in this region, and the subsequent use of upright log hives, and of skeps. Although

was  
skep beekeeping ~~is~~ confined to such a small part of the world, the skep has been widely used as a symbol of beekeeping, and latterly of industry and thrift. It is a much less adaptable hive ~~type~~ than the horizontal ones, and this very factor may have encouraged beekeepers to ~~invest a better, more~~ <sup>experiment, in order to</sup> ~~discover a better and more~~ adaptable hive.

[ I shall pass over these important European developments, <sup>because they are</sup> ~~that are~~ more familiar to you, and tell you something about the development of beekeeping in the world at large. ] <sup>Therefore,</sup> A hundred years ago, the beekeepers in the temperate zones of the world were living in a very exciting time, exploring and exploiting the possibilities of shifting from the traditional fixed-comb beekeeping to the new movable-frame beekeeping. One can get the flavour of this excitement by reading the bee journals of the time, and this was the period in which bee journals, and beekeepers' associations, were founded: their function was to exchange ideas about the new possibilities, and to teach the less educated and poorer beekeepers how to take advantage of the <sup>that were becoming</sup> ~~now~~ advances available. This is the basic reason why we are today able to celebrate the hundredth anniversary of the Bienenzuchtvereins Grossköln, which played an important part in the development of the new rational or movable-frame beekeeping.

Die Rheinische Bienenzeitung, now incorporated in Die Biene, was started in 1849 as the Vereins-Blatt des Rheinisch-Westfälischen Vereins für Bienen- und Seidenzucht. An even earlier German journal, Die Bienenzeitung, was started in 1845, and published until the end of the century. Last month I received an enquiry concerning this journal, which may be of interest to you. A research worker <sup>in England,</sup> who is studying Charles Darwin's relationships with breeders of plants and animals, sought my help in connection with a possible publication by Charles Darwin that was not recorded in <sup>any</sup> biblio-



graphies of his works. <sup>15</sup> ~~This~~ turned out to be a letter in Die Bienenzeitung August 1862. By good fortune - and thanks to the generosity of one of the German beekeeping institutes - we had this volume in our Library. Here is the letter:

In German  
no need to type out!

[Dr. Dzierzon's reply, in the same issue of the journal, gave examples of differences in colour etc of bees in Germany and Austria, but had to point out that these differences must be attributed to the introduction of Italian bees to various apiaries, rather than to geographical variation]

Charles Darwin was concerned with many aspects of bees and beekeeping. For instance our Library has an original letter from him, written soon after 1860, expressing his interest in the newly invented comb foundation. So ~~Anyway,~~ I was pleased to be able to add a new item to the definitive Darwin bibliography.

I spoke a little while ago of the developments in the last century "in the temperate regions of the world". The developments started in North America and Europe, and spread also to Australia and New Zealand. But in general they left almost untouched the tropics and much of the subtropics. Many of these latter regions were undeveloped, although some had a very rich tradition of beekeeping with fixed-comb hives. These hives are of very great interest and variety, and I have described some of them in a book on the archaeology of beekeeping which will be published later this year. I think that Ehrenwirth Verlag will distribute it in Germany, in collaboration with the London publisher Duckworth. At the present time there is widespread and active <sup>beekeeping</sup> development in the tropics and subtropics, and the situation now is just as exciting as that in the temperate zone a hundred years ago.

At high latitudes, the growing season, and therefore the honey production season, is short and intense, and when the flowers are in bloom the days are very long; bees can forage for many hours each day. They store enough honey to last them through a long cold winter. Near the equator it is hot enough for bees to fly during all or most of the year, and there may be honey flows for most of the time. If there is a dearth period due to monsoon rains, or to drought, it is usually short. Tropical honeybees therefore do not need to store much honey. Nor do they need to cluster together to keep warm, as our bees do, and ~~they may be unable~~ <sup>it is likely that they are</sup> to do this. Moreover in many places tropical bees avoid a dearth period by migrating. Brood rearing is brought to a halt, and the colony of adult bees (with the queen) flies off to another area a few kilometres away, where new bee forage is coming into bloom. This may be due to a difference in altitude or rainfall. So the bees work two areas each year. At both places a beekeeper may get a harvest from the same colony. [On the other hand it is tiresome for the beekeeper when his colony disappears from its hive, and tropical bees are also liable to abscond from their hive when the colony is too much disturbed. The bees in tropical Africa (and now in South America) are also what is called "aggressive", and can sting so readily that it is <sup>often</sup> impossible to use modern movable-frame hives for them. ~~I will come back to~~ <sup>In spite of</sup> such difficulties ~~this point in a moment.~~ In the last 30 or 40 years, there have been great developments in beekeeping in the tropics and subtropics, and beekeeping ~~now~~ <sup>exists</sup> in at least 150 ~~of them.~~ <sup>countries there.</sup> ~~Nevertheless~~ <sup>And</sup> there is still an enormous untapped potential for honey production.

One might think that these problems could be overcome by introducing temperature-zone *Apis mellifica* into the tropics, but there are difficulties here. <sup>too</sup> The daily foraging cycle of European bees is wrong for the tropics, where plants usually secrete nectar in the cooler parts of the day, early morning and late evening. <sup>There is little nectar in</sup> ~~The~~ middle part of the day, which is the European bees' peak foraging period, <sup>and</sup> ~~is spent by~~ tropical bees <sup>spend this time</sup> inside the hive, conserving energy. In the Old World tropics - Africa and Asia - there are many enemies that attack bees and their nests, (hence the aggressiveness of tropical African bees), and the gentler European bees may not be able to withstand the <sup>ir</sup> attacks. European bees experience other difficulties too, in <sup>where</sup> ~~relation to mating in the presence of~~ are present, & in other ways, other species of honeybees, but I have no time to talk about these now.

In general these difficulties relate to the full tropics, and much less so to the subtropics, ~~which contain some of the best honey-producing areas in the world.~~ <sup>Here</sup> ~~In the subtropics~~ <sup>often</sup> it is possible to use ~~temperate-zone~~ <sup>bees</sup> *Apis mellifica* ~~of European origin,~~ which can be managed successfully in modern tiered hives. Indeed the modern hive as we know it was developed for these particular bees. Also, most of the year <sup>it</sup> is warm enough for bees to fly, and for plants to flower, so a high honey harvest can be obtained from each hive. As a result, the subtropics contain some of the best honey-producing areas of the world.

→ The world's three largest honey exporters are Mexico and the Peoples Republic of China in the northern subtropics, and Argentina in the southern subtropics. South Africa and Australia in the south are also good honey producers, and North Africa in the northern subtropics.

could be, but beekeeping there is not yet well enough developed to take advantage of it.

in developing beekeeping,

[ At IBRA, we have been deeply involved with solving the problems and exploiting the possibilities. One of the first jobs was to <sup>gather</sup> ~~get~~ together a full documentation of the scattered

for honey production, in countries where beekeeping food is desperately needed.

literature on the subject. We did this in 1978, with funds from a Canadian Agency, and published the "Bibliography of Tropical Apiculture", <sup>in 24 Parts.</sup> In our work we found so much more material than we had expected, scattered in books and journals published throughout the world, that we also published 14 Satellite Bibliographies. These two volumes now form the basis for current and future progress. Through the distribution of this Bibliography, we were able to identify 360 institutions in 105 developing countries that are actively concerned with developing beekeeping, and we are now publishing a directory of these institutions in the tropics and subtropics.

Many aid agencies of different governments have carried out feasibility studies and development programmes in various countries, but some of us have been very concerned that there was much duplication of effort in this work, because nobody seemed to know what anyone else was doing. Professor Drescher, in the University of Bonn,

succeeded in interesting the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) <sup>situation funds been</sup> ~~about~~ in this problem, and ~~they~~ have <sup>provided</sup> ~~the funds for~~ to remedy it.

IBRA has (two)

<sup>eschel</sup> preparing a directory to the many programmes and proposals that exist, <sup>has compiled</sup> ~~with~~ and Dr guidelines for implementing them. It took <sup>us</sup> over a year of enquiries ~~from~~

IBRA to discover the many programmes, ~~reaching~~ a total of 133 in 85 countries.

We <sup>are</sup> have now corrected the proofs of this book and it will appear shortly.

Last year FAO commissioned IBRA to prepare a book on "Apiculture and honey production in the developing countries of the tropics and subtropics". *This has been completed, and* ~~and this~~ *(is* now being translated into French and Spanish - unfortunately not also into German. This month we finished another project for the Canadian Agency, the publication of a series of leaflets for developing countries on "Source materials for apiculture". They include such subjects as suppliers of beekeeping equipment (and we have prepared a world-wide directory of these suppliers also); selected reference books suitable for an apicultural library; plants especially suitable for growing for bees and honey production as well as for other uses; opportunities for training in beekeeping, and so on. ~~All of this is done on a world-wide basis.~~

It is not easy to illustrate what I have just been talking about with slides, <sup>so</sup> ~~but~~ I will finish <sup>by</sup> ~~up with~~ showing you <sup>some pictures of</sup> a very small sample of the diversity of beekeeping itself in the developing countries, now, and as it may be in the future.