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TRAVAUX PUBLIÉS PAR DES MEMBRES DE L'UNION

ABBOTT (C. P.), BUTLER (C. G.). — 1952. **The scientist and the cine-camera.** (*Rep. Cent. Ass. Beekeep., Oct.*)

The use and value of the cine camera as a tool in bee research, particularly with respect to investigations on bee behaviour, are discussed.

BAILEY (L.). — 1952. **The action of the proventriculus of the worker honeybee** *Apis mellifera* L. (*J. exp. Biol.*, **29**, 310.)

A detailed account is given of the method of filtration of small particles (pollen grains and Nosema spores) by the proventriculus from the honeystomach. The rates of filtration of different concentrations and sizes of particles, and of different volumes of suspensions, are analysed and the possible physiological significance of the filtration activity is discussed.

BAILEY (L.). — 1953. **The effect of fumagillin upon** *Nosema apis* (Zander). (*Nature, Lond.*, **171**, 212.)

The curative effect of fumagillin upon an established infection within individual bees is described. The drug acts upon the developing intracellular stage of the parasite, but relapses occur even after continuous treatment for seventeen days.

BAILEY (L.). — 1953. **The treatment of Nosema disease with fumagillin.** (*Bee World*, **34**, 136.)

The results of autumn treatment of infected colonies with fumagillin are given. The preventive effect of this treatment upon the resurgence of the disease during the following spring was striking. However, a low level of infection became apparent in treated colonies in late spring. It is considered to have arisen from the old comb, which still contained viable spores from the previous year.

BAILEY (L.). — 1953. **The transmission of Nosema disease.** (*Bee World*, **34**, 171.)

The carrying over of the disease from one year to the next by spores upon comb has been demonstrated. The transference of colonies from old combs to new comb foundation during early summer has been shown to be effective in breaking the cycle of infection, as the transmission of this disease from infected to healthy bees virtually ceases during the flying season.

BAILEY (L.). — 1954. **Nosema disease.** (*Bee World*, **35**, 69.)

BAILEY (L.). — 1954. **Bee Poisoning.** (*Bee World*, **35**, 221.)

BAILEY (L.). — 1954. **The control of Nosema disease.** (*Bee World*, **35**, 111.)

The results of final experiments on the effect of transferring colonies on to clean comb are given. The disease was eliminated when bees were transferred on to clean comb and were allowed to recover their brood and stores from the old comb before the latter was removed. Methods and results of sterilizing old comb with acetic acid and formalin are given.

BAILEY (L.). — 1954. **The filtration of particles by the proventriculi of various aculeate Hymenoptera.** (*Proc. Roy. ent. Soc.*, **29**, 119.)

The correlation between the anatomy of the proventriculi of various hymenoptera and their efficiency in filtering particles from liquid suspension in the crop is described. The physiological significance of this function is discussed.

BAILEY (L.). — 1954. **The respiratory currents in the tracheal system of the adult honeybee.** (*J. exp. Biol.*, **31**, 589.)

The inactive bee inhales and exhales via the first thoracic spiracle. In air containing a high concentration of CO_2 the propodeal spiracle becomes inactive and its opening movements are synchronous with abdominal pumping. Under these conditions there is a marked current of air through the thorax, entering via the first thoracic spiracle and leaving via the propodeal spiracle.

BLACKITH (R. E.). — 1900. — **The Analysis of Social Facilitation at the Nest Entrances of some Hymenoptera.**

The passage of unmarked social hymenoptera in and out of their nests is decisively non-random, grouping being demonstrated with both wasps and bumble bees. The observed distributions follow the negative binomial, one plausible interpretation of which assumes that workers are inhibited from passing through the nest entrance until sufficient individuals have accumulated to act as a releaser. Most workers of the red wasp *Vespula rufa* are released by the accumulation of from one to three further workers at the entrance. Other species of wasp seem to have less marked inhibitions. Young queen bumble-bees (*Bombus lapidarius*) have significantly higher inhibitions than have workers of this species. Worker wasps may obtain their releaser from individuals passing in the opposite direction only when insufficient pass in the same direction.

Different types of test reveal non-random passage of the nest entrance when many or when fewer insects are active. Grouping may be measured by the entropy of social organization. Somes methods of estimating the number of workers foraging and of the mean duration of a flight, depend on a complete return of workers to the nest at night. A dawn to dusk record shows that this return may be far from complete, leading to biassed estimates.

BRIAN (M. V.). — 1955. **Food collection by a Scottish Ant Community.** (*J. Anim. Ecol.*, **24**, 336-51.)

1. The feeding system of a four-species community of rather primitive ants characteristic of west Scotland, has been studied. The species were *Formica fusca* L. *Myrmica rubra* L., *M. scabrinodis Nyl.* and *Leptothorax acervorum* Fab.—2. Small sources of sugar could be monopolized, especially if near to the nest, and actual occupation by a group of workers was the main essential to this, although the largest species, fusca, could sometimes dislodge the others. The ability to find a source and mobilize feeders on it was a greater guarantee of success than ability in fighting.—3. The hunting, distribution of rubra was asymmetrical about the nest, even in isolated colonies. In dense groups of colonies, nesting in rotting tree stumps and foraging into long herbs, the same individual asymmetry existed with a tendency for these areas to fit together so that the whole area was searched. These rubra home-ranges were entirely overlapped by the much larger ranges of fusca and acervorum.—4. Three of the species were shown to vary in their propensity to ascend vegetation. *Myrmica scabrinodis*

foraged principally on the soil surface and perhaps below, fusca readily climbed vegetation, whilst rubra was intermediate in this respect.

BRIAN (M. V.), BRIAN (A. D.). — 1955. **On the two forms Macrogyna and Microgyna of the ant *Myrmica Rubra* L.** (*Evolution*, No. **3**, 1955.)

The degree of reproductive contact between the populations of two integrading forms of *Myrmica rubra* L. (now designated as the sub-species macrogyna and microgyna) is considered. Like matings are more frequent than unlike, but not good evidence of selection by the individuals concerned could be obtained. Rather it appears to be due to circumstances created by differences in the space-time distribution of the populations. Such differences arise directly and indirectly from the reproductive differences between the subspecies which adapt them severally to seral (macrogyna) and biotic plagioclimax (microgyna) vegetation respectively. Such intermediates (assumed to be hybrids) as occur are likely to be sub-viable for socio-ecological reasons (although physiological and genetic ones may reinforce these). It is suggested that evolution from a less specialised form must have occurred during spatial isolation under different ecological conditions.

BUTLER (C. G.). — 1939. **The drifting of drones.** (*Bee World*, **20**, 140-42.)

Large numbers of drones belonging to several different colonies were marked with coloured paints, each colony being given its own distinguishing mark. Subsequent observation of the distribution of these drones in the apiary, which contained some 20 mating nuclei as well as 40 full-strength colonies of bees, led to the conclusion that drones seldom drift from their own hive into that belonging to another colony or even into a nucleus with a virgin queen. Drones will, however, join any swarms which happen to be about, being readily accepted and, having once joined them, remain attached to them thereafter.

BUTLER (C. G.). — 1939. **An automatic drinking fountain in the apiary.** (*Bee World*, **22**, 119-120.)

A well-protected, warm and easily cleaned drinking foutain with automatic control of the water supply by means of the float-chamber of a carburetter is described.

BUTLER (C. G.). — 1940. **The choice of drinking water by the honeybee.** (*J. Exp. Biol.*, **17**, 253-261.)

The honeybee prefers dilute sodium chloride and ammonium chloride solutions to distilled water. She does not prefer concentrations of these salts higher than N/20 solutions, and solutions of various other salts to distilled water. The honeybee appears unable to distinguish between N/160 sodium chloride or N/160 ammonium chloride and distilled water. Bees are probably largely attracted to such sources of drinking water as rain water gutters choked with decaying organic matter, swetage effluent, etc., by a water perception sense coupled with an olfactory appreciation of various volatile substances contained in these sources of water.

BUTLER (C. G.). — 1940. **The ages of the bees in a swarm.** (*Bee World*, **21**, 9-10.)

As a result of marking experiments and the subsequent analysis of bees in prime swarms into age groups it is concluded that a swarm is largely composed not of the older bees, as had previously been assumed, but of the younger and middle-aged bees.

BUTLER (C. G.). — 1941. **A possible new cure for acarine disease of honeybees.** (*Nature*, **148**, 86.)

The vapour of terpineol, a heavy fraction of crude pine oil, was found to be highly toxic to the nymphs and adults of *Acarapis woodi* but to be harmless to adult bees and their brood.

BUTLER (C. G.). — 1941. **A study of the frequency with which honeybees visit red clover (*Trifolium pratense*) together with an examination of the environmental conditions.** (*Ann. Appl. Biol.*, **28**, 125-134.)

Honeybees were found to work red clover, both first and second crops for pollen and nectar. Two peak periods of activity, about 10.30 a.m. and 3 p.m. (G. M. T.) are exhibited by pollen gatherers: it is probable that these plants reach their peak of pollen dehiscence at these times. The visits of honeybees to collect nectar are chiefly determined by the height reached by the nectar in the corolla tubes of the flowers. When the sugar concentration of the nectar of red clover flowers was lower than that of other "honey" plants in bloom at the same time in the locality, or when the nectar was not sufficiently high in the corolla tubes for easy collection, bumblebees were usually more abundant on red clover than honeybees, except at the peak periods of pollen collection. When conditions were suitable for the nectar collection five or six times as many honeybees as bumblebees were usually present. Few insects other than honeybees and bumblebees were found working red clover.

The honeybee carries on an average about 284,000 red clover pollen grains per load and visits a minimum of 284 flowers in collecting this load. In the U. S. A. honeybees have been credited with the cross-pollination of about 82 per cent of the red clover crop, bumblebees with 15 per cent, and the hymenopterous, lepidopterous and dipterous pollinating insects with 3 per cent. No comparable data collected in this country are available for cross pollination of an important part of the seed crop.

BUTLER (C. G.). — 1943. **Bee paralysis, May sickness, etc.** (*Bee World*, **24**, 3-7.)

There are a number of complaints and one true disease of the honeybee which all exhibit very similar signs in the apiary, and which may conveniently be grouped together as Bee Paralysis. Nine types of Paralysis are distinguished, most of them being due to a dietary upset or poisoning. Paralysis due to the consumption of frost-damaged pollen, honeydew from lime trees, concentrated lime nectar, the spores of the fungi *Aspergillus calyptratus* and *A. versicolor*, etc., is described. It is pointed out that these forms of paralysis, although sometimes serious in their effects, soon disappear once the causative agent has been removed, which fact accounts for the sudden ontset and equally sudden disappearance of the complaints in the apiary.

BUTLER (C. G.). — 1943. **The position of the honeybee in the national economy.** (*Ann. Appl. Biol.*, **30**, 189-191.)

The main function of beekeeping in both peace and wartime is the provision of pollinators for fruit and seed crops. There is good evidence that in many places where large orchards or large areas of insect-pollinated seed crops are planted, there are insufficient wild pollinating insects present for full production to be obtained. Man has upset the balance between the numbers of flowers requiring pollination and the number of pollinating insects available to effect their pollination. The honeybee is the only pollinating insect which can readily be used to redress the balance. It has been estimated that the average annual value of each colony of bees to the nation is about £ 12.

BUTLER (C. G.). — 1943. **Work on bee repellants. Management of colonies for pollination.** (*Ann. Appl. Biol.*, **30**, 195-196.)

It was found that lime sulphur, nicotine and nicotine sulphate were all capable when added to spray mixtures containing arsenic of repelling honeybees from collecting these mixtures as drinking water. If applied to open flowers, they had some, but not a 100 per cent, deterrent effect upon honeybees attempting to visit these blossoms.

BUTLER (C. G.). — 1945. **The incidence and distribution of some diseases of the adult honeybee.** (*Ann. Appl. Biol.*, **32**, 344-351.)

Since 1918 four complaints of the adult honeybee, acarine disease, nosema disease, amoeba disease and bee paralysis, have been recognised in this country. Surveys

designed to discover the incidence and distribution of these diseases were carried out during the winter 1941-1942 and 1943-1944. It was found that none of these diseases is clearly confined to any definite areas of England and Wales. Acarine disease, however, is apparently more abundant in the west and south-west; and nosema disease appears to be most prevalent in the home counties and also has other areas of heavy infection in Leicestershire and Cumberland, Lancashire and Yorkshire. Bee paralysis in its various forms is both widespread and common, and amoeba disease, although relatively rare, has been found to be widely distributed throughout the country.

BUTLER (C. G.). — 1945. **The behaviour of bees when foraging.** (*J. Roy. Soc. Arts*, **93**, 501-511.)

From the 20th day of adult life onwards the young worker honeybee is concerned with the collection of water, pollen and nectar. She finds her way back to her hive from a foraging site by means of at least three senses, a sense of direction, a sense of distance travelled and also a sense which enables her to locate visual landmarks near her hive and to orientate herself correctly thereto. Bees do not wander at random over any given crop but confine their attention to a small area of the crop. These "fixation areas" of individual bees overlap to some extend and thus some cross-pollination is effected. It is nevertheless difficult to see at first sight how cross-pollination is effected in an orchard, as we know it is, where a single tree or even a part of a tree may serve as the "fixation area" of an individual bee. It has been found, however, that if the population of pollinating insects, and therefore the degree of competition, is sufficiently great, then there is a "wandering" population of bees seeking "fixation areas" of their own, superimposed upon the "fixed" population. It is this "wandering" population, which is mainly composed of young bees, which provides the cross-pollinators. It is now considered to be best for fruit growers to place colonies of bees, maintained in their orchards for purposes of pollination, together in one or more groups somewhere near the centre of each 30 acres of orchard, irrespective of the number of colonies available, rather than to scatter them about throughout the orchard. If this is done the grower can, over several years, find out the necessary number of colonies of bees of any given strength required if full production is to be obtained. Seed growers, whose problems are different, can none-the-less also use honeybees to advantage in many districts and also determine how many colonies of bees they will require.

BUTLER (C. G.). — 1945. **The influence of various physical and biological factors of the environment on honeybee activity. An examination of the relationship between activity and nectar concentration and abundance.** (*J. Exp. Biol.*, **21**, 5-12.)

Both nectar abundance and concentration appear to have considerable effect upon honeybee activity. From the data at present available, it appears reasonable to conclude tentatively that nectar concentration decides in the first instance which species of plants will be visited in preference to others in flower at the same time, and that nectar abundance then determines the proportion of the foraging population of a colony which will work the flowers in question.

BUTLER (C. G.), COCKBILL (G. F.). — 1942. **Preliminary investigations on the value of electric heating of beehives.** (*Ann. Appl. Biol.*, **29**, 34-42.)

The general effect of all intensities of heating appeared in these experiments to be to reduce the area of brood present in mid April and to increase the winter consumption of stores, in direct contradiction to any belief in a beneficial effect on the colony.

BUTLER (C. G.), FINNEY (D. J.). — 1942. **The influence of various physical and biological factors of the environment on honeybee activity. An examination of the relationship between activity and solar radiation.** (*J. Exp. Biol.*, **18**, 206-212.)

A review of the literature shows that those who have studied the influence of solar radiation on honeybee activity are agreed that it is an important limiting factor. Fresh analysis of some of this data, however, throws doubt upon some of the conclusions

previously reached. New data were, therefore, collected which clearly show an association between variations in honeybee activity and the radiation of clear light.

BUTLER (C. G.), FINNEY (D. J.), SCHIELE (P.). — 1943. **Experiments on the poisoning of honeybees by insecticidal and fungicidal sprays used in orchards.** (*Ann. Appl. Biol.*, **30**, 143-150.)

Of the common constituents of spray mixtures only lead or calcium arsenate were found to be likely to cause serious honeybee poisoning, though Derris emulsion may cause slight poisoning. Lime sulphur, nicotine sulphate and copper sulphate are all repellent to bees. Concentrations of 1/500 lime sulphur or 1/2000 nicotine sulphate were sufficient to reduce the uptake of M/1 sucrose to less than 10 per cent. of that of unadulterated sucrose solutions. The presence of lead arsenate in these solutions appeared to make them even more repellent. Lead arsenate solutions were found to be no more attractive to bees than distilled water. Bees may collect arsenic when visiting fruit trees, or plants growing beneath or near the trees, for pollen and water, contamined water apparently being the chief cause of poisoning. The addition of 1 per cent. lime sulphur was sufficiently deterrent to prevent bees collecting contaminated water. The other cause of arsenic poisoning is the collection by the bees of contaminated pollen and can be most serious. This form of poisoning can only be prevented by growers refraining from spraying open blossom.

BUTLER (C. G.), JEFFREE (E. P.), KALMUS (H.). — 1943. **The behaviour of a population of honeybees on an artificial and on a natural crop.** (*J. Exp. Biol.*, **20**, 65-73.)

In an experimental field filled with dishes of syrup to represent flowers individual bees were observed to visit one chosen dish with great regularity provided that the supply of syrup did not become exhausted. Bees were deterred from collecting syrup from dishes placed even partially in shade and they very seldom worked beneath the shade of trees. Over the range of distances covered (160-400 yards) they were always more visitors to the nearer than to the more distant dishes; the extent of the difference, however, varied from day to day. Bees accustomed to collect syrup from the dishes furthest from the hive did not move to sites nearer home when the weather became unfavourable. There was some evidence, however, that bees working a long way from the hive were more easily deterred from foraging by unfavourable weather than those working close to the apiary. Bees marked on a patch of *Epilobium augustifolium* situated in the midst of a fairly large crop of this plant, were usually recovered within 5 yards of the point of marking. Such bees remained "fixed" to his area for days. The same was found to be true with other plants.

BUTLER (C. G.). — 1946. **The provision of supplementary food to hive bees.** (*Ann. Appl. Biol.*, **33**, 307-309.)

Four British Standard brood combs full of pollen provide the necessary protein requirements for a colony on B. S. equipment from late autumn until April of the following year.

Sucrose syrup is not so satisfactory as honey as winter and spring food for bees, but a mixture of equal parts of honey and syrup proves to be satisfactory. The strongest colonies in April are produced by confining feeding to autumn, and wintering the bees on 35-40 lb. of honey or honey and concentrated sucrose syrup. Feeding with syrup and pollen is only found to be advantageous when the colony concerned lacks adequate reserves of carbohydrate and protein; the feeding of honey or syrup in spring may have a retarding rather than a stimulative effect upon colony development.

BUTLER (C. G.). — 1946. **Further investigations on the value of electric heating of beehives.** (*Ann. Appl. Biol.*, **33**, 310-313.)

Three groups of colonies of bees were employed, two of these groups having heat applied to them by means of a specially designed frame heater, different intensities of heat being applied in each case. No noticeable effect on the consumption of stores

was observed, and the heated colonies were weaker than the unheated colonies at the beginning of May. Colonies in top entrance hives wintered no better than those housed in normal bottom entrance hives, nor were significant differences in brood chamber temperatures recorded.

It is concluded that no benefit was obtained from electrical heating at the intensities of heat applied.

BUTLER (C. G.). — 1946. **Bee culture in the U. S. A.** (*Agriculture*, **53**, 265-268.)

A report on a tour of bee Research Centres and Agricultural Research Stations, etc., in the U. S. A.

BUTLER (C. G.). — 1946. **Bee culture and research in the U. S. A.** (*Ann. Rept. Central Assoc. of B. B. K. A.*, 2-10.)

A brief report on a visit made to North America and of bee research work in progress in the Federal and some State laboratories. Particular reference is paid to work on artificial insemination of queen honeybees; the resistance of certain strains of bees to American Foul Brood : European Foul Brood: the sulphonamide treatment of American Foul Brood.

BUTLER (C. G.). — 1947. **Some trends of bee research to-day.** (*J. Dept. Agric. Scot.*)

BUTLER (C. G.). — 1948. **Aspects of Bee Behaviour.** (*Discovery*, 9, 107-110.)

A short, popular account of some recent research on the foraging behaviour of honeybees and of the methods of communication practised by them.

BUTLER (C. G.). — 1948. **Bee Research.** (*Scottish Agriculture*, **27**, 131-135.)

An account of the development of the technique of artificial insemination of queen honeybees and of the part which this new technique is likely to play in the development of strains of bees for the pollination of the flowers of specific seed crops. The control of American Foul Brood by the development of strains of bees that exhibit resistance to the disease, and by the use of sulphonamides, etc., is also discussed.

BUTLER (C. G.). — 1948. **Bee Behaviour.** (*Nature*, **163**, 120.)

A condensed discourse on recent work on the division of labour in the honeybee colony and of the behaviour of honeybees in the field whilst seeking nectar and pollen.

BUTLER (C. G.). — 1949. **An Introduction to the Sense Physiology and Behaviour of the Honeybee.** (*Book. Oxford Univ. Press.*)

BUTLER (C. G.). — 1949. **Some trends in bee research today.** (*Ann. Rpt. Central Assoc. of B. B. K. A.*)

BUTLER (C. G.). — 1950. **A new design of microsyringe tip for instrumental insemination of queen honeybees.** (*Nature*, **166**, 957-958.)

A description of a syringe tip which enables the syringe to be held in the hand throughout the operation of introducing semen into the queen honeybee, and allows of easy introduction of the syringe without the use of a probe.

BUTLER (C. G.). — 1951. **The importance of perfume in the discovery of food by the worker honeybee** (*Apis mellifera*, L.) (*Proc. roy. Soc. B.*, **138**, 403-413.)

Worker honeybees have an inherent tendency to associate certain perfumes with food. This results in untrained scouting bees being attracted to certain kinds of flowers, such as hawthorn and wild white clover, which they have never visited before.

If the perfume of a crop of newly-opened flowers is sufficiently powerful, it sometimes attracts scouting bees from a considerable distance away. But, normally, a bee has to approach to within a few centimetres of a mouth of a flower before she can appreciate its perfume. If a bee has learned to associate a particular perfume with a particular

group of flowers she will seldom enter any flower in the group unless she can smell its perfume.

When a bee is attracted towards a flower or flower-like object and approaches it closely, any attractive perfume it may possess tends to acts as a stimulus to further exploration which may involve settling on the object and possibly extending her tongue and seeking food in any small crevice in or around the object.

In general, the results obtained with untrained bees support the conclusions reached by von Frisch in 1919 in his work with trained bees, and suggest that both of these categories of bees behave in a similar way when seeking food.

BUTLER (C. G.). — 1951. **Beekeeping and agriculture.** (*Brit. agric. Bull.*, **4**, 16.)

A discussion of the part played by honeybees in the pollination of fruit and seed crops, and of the way in which recent advances in bee research have made it possible for beekeepers to co-operate with fruit and seed growers more effectively than in the past.

BUTLER (C. G.). — 1952. **The development of British honeybees.** (*Rev. Ass. Agric. Lond.*, **17**, 9.)

A discussion of the development of the strains of honeybees in Britain today, together with some views with regard to their future development.

BUTLER (C. G.). — 1952. **Behaviour of social insects.** (*Nature, Lond.*, **170**, 642.)

A synopsis of the papers on this subject read during the Belfast meeting of the British Association.

BUTLER (C. G.), FREE (J. B.). — 1952. **The behaviour of worker honeybees at the hive entrance.** (*Behaviour*, **4**, 262.)

Guard bees are not found at the hive entrance unless their colony has been alerted by the presence of robber bees or numbers of bees that have strayed from other colonies or by disturbance of some kind. The degree of alertness exhibited varies under different conditions and with different strains of bees and may be of short or long duration. Intruders are not molested by unalerted colonies. Bees of various ages undertake guard duties and attempt to intercept and inspect other bees on the alighting-board of the hive. They recognise members of their own colony and distinguish them from bees from other colonies very quickly by scent. Robber bees are, however, recognised as such by their actions before the guards can approach and examine them.

On interception the fate of intruders is largely dependent upon their subsequent behaviour. The guards immediately try to sting robbers and will also fight violently with guard bees from other colonies, but very seldom attack other intruders. Many intruders adopt a submissive attitude and exhibit the "displacement activity" of tongue-stropping, sometimes passing into a state of thanatosis. A high proportion of submissive intruders are mauled and dragged away from the hive entrance irrespective of their age; however, those that do succeed in remaining in a strange colony for a few hours become accepted by the bees of that colony.

BUTLER (C. G.). — 1954. **The World of the Honeybee.** (*Book. New Naturalist Series London, Collins.*)

BUTLER (C. G.). — 1953. **The present status of beekeeping in Ceylon and possibilities for its future development.** (*Brit. agric. Bull.*, **6** (26), 125.)

BUTLER (C. G.). — 1953. **A report on the results of an investigation into the possibilities of beekeeping in Ceylon, together with some suggestions for the future development of beekeeping in the Island.** (*Sessional Paper, Government of Ceylon.*)

BUTLER (C. G.). — 1954. **The method and importance of the recognition by a colony of honeybees** (*A. mellifera*) **of the presence of its queen.** (*Trans. R. ent. Soc. Lond.*, **105**, 11.)

Data are given in support of the theory that bees normally obtain something from their queens which inhibits them from rearing further queens. The results of experiments and observations indicate that a small number of the worker bees of a colony obtain this "queen substance" by licking all parts of the body surface of their queen, and subsequently share it with the other members of their colony. An adequate supply of "queen substance" inhibits worker ovary development as well as the production of new queens. It is suggested that in ants, bees and termites the collection and distribution of "queen substance" is the most important single factor in the maintenance of colony cohesion.

FABERGE (A. C.). — 1943. **Apparatus for recording the number of bees leaving and entering a hive.** (*J. Sci. Inst.*, **20**, 28-31.)

An apparatus giving a continuous record of the number of honeybees leaving and entering a hive is described. Bees pass through a trap, producing electrical impulses. The recording part consists of a magnetic escapement causing a cursor carrying a type figure to travel above the paper. At regular time intervals the position of the cursor is printed, and it is brought back to the zero position. By actual test it was found that the escapement was capable of resolving a pair of impulses 1/11 second apart with certainty; the resolution may be higher.

FREE (J. B.). — 1954. **The behaviour of robber honeybees.** (*Behaviour*, **7**, 233.)

It is shown that the characteristic, hesitant, swaying flight of robber bees is an innate response to the sight of a congestion of bees, either of their own or from another colony, near the hive entrance they wish to enter. When the entrance of a hive is not crowded with bees, robbers will enter without hesitation, even when the hive contains a colony of bees. It is concluded that guard bees quickly recognise would-be robber bees by their characteristic flight behaviour, and subsequently confirm their identity by olfactory examination.

HARRIS (W. V.). — 1954. **Termites from Socotra (Isoptera).** (*Ann. Mag. Nat. Hist. ser.* 12, **7**, 493-497.) — 1954. **Further records of East African Termites-II.** (*Proc. R. Ent. Soc. B*, **23**, 127-137.) — 1954. **The War on White Ants.** (*New Commonwealth*, 1954, 455-459.) — 1954. **Exhibit of** *Apicotermes* **nests.** (*Proc. R. Ent. Soc. C.*, **19**, 35.) — 1954. **Exhibit of** *Reticulitermes flavipes* **from Hamburg.** (*Proc. R. Ent. Soc. C*,. **19**, 44-45.) — 1954. **Termites in Europe.** (*Ent. Mon. Mag.*, **90**, 194-197.) — 1954. **Developments in Termite Research. Rep. VI.** (*Commonwealth Ent. Conf. London*, p. 126-130.) — 1955. **The Prevention of Termite Damage to Buildings.** (*Colonial Building Notes*, *No.* **26**, 1-6, D. S. I. R. London.) — 1955. **Termites and Forestry.** (*Emp. For. Rev.*, **34**, 160-166.) — 1955. **An American Termite in Imported Timber.** (*Wood*, **20**, 366-367.) — 1955. **Exhibit of living** *Kalotermes* nr. *jouteli* **and preserved** *Zootermopsis augusticollis* **from imported timber.** (*Proc. R. Ent. Soc. C.*, **20**, 36-37.) 1955. **Termites and the Soil.** (*Kevan, Soil Zoology; London, Butterworths*, p. 62-72.)

HASSANEIN (M. H.). — 1951. **The influence of** *Nosema apis* **on the larval honeybee.** (*Ann. Appl. Biol.*, **38**, 844.)

It was found to be impossible to infect the larval honeybee with *Nosema apis*. In colonies suffering from this disease about 15 per cent of the eggs laid failed to result in adults, probably because of inadequate care and feeding.

KALMUS (H.), RIBBANDS (C. R.). — 1952. **The origin of the odours by which honeybees recognise their companions.** (*Proc. roy. Soc. B.*, **140**, 50-59.)

Bees from two colonies were trained to forage from different dishes, placed one yard apart. Their thoraces were distinctly marked. Recruits to the dishes were also distinctly marked, and they were found to be preferentially attracted to the dish visited by members of their own colony.

Recruits were not attracted to the dishes by the sight or sound of their companions.

They were attracted by their distinctive odour. These odours were not inherited, but were produced by changes in the food supply of the colonies. They would develop between queenless halves of colonies.

Uniform and distinguishable colony odours are a consequence of the wide-spread food transmission which takes place amongst the foragers of each colony. Their role in orientation and the defence of the honeybee community is discussed.

KRISHNAMURTI (B.). — 1939. — **A Brief analysis of eleven years (1928-1938) records of scale-hives, at the Rothamsted Bee Laboratory.** (*Bee World*, **20**, 121-123.)

On the assumption that high temperature, long hours of sunshine and low rainfall are desirable for honey production, a rough classification of the weather conditions in the different years was made. This method, although only a rough one, immediately separated out the best years both for weather and honey production. It was found that years of favourable weather conditions appear to be succeeded by unfavourable ones more or less regularly.

MILNE (P.). — 1941. **Wax-moth and bald-headed brood.** (*Bee World*, **23**, 13-14.)

It was observed that larvae of *Achroia grisella* Fabr. are sometimes found lying alongside pupal honeybees contained in cells from which the normal cappings are missing. Masses of faecal pellets of the wax-moth larvae were found adhering to the pupae, many of which developed with deformed limbs. Burrows from cell to cell were observed. The large number of faecal pellets present and the absence of damage to the mid-rib of the comb suggests that the "Bald-headed" appearance is due to the cappings having been eaten away from below by the wax-moth larvae.

MILNE (P. S.). — 1943. **Brood diseases of the honeybee.** (*Ann. Appl. Biol.*, **30**, 191-194.)

A discussion of the pathogenic organisms, etc., responsible for Chalk Brood, American Foul Brood, and European Foul Brood, and the methods by which these diseases are carried from one colony to another. The attempt to control the two Foul Brood diseases by mutual co-operation between beekeepers and the aid of insurance schemes, and latterly by means of legislation, are described.

MILNE (P. S.). — 1943. **The spread of American foul brood.** (*Brit. Bee J.*, **71**, 298-300.)

A discussion, with a diagrammatic representation of eleven ways in which *Bacillus larvae* becomes distributed within a hive of bees, and of ten ways by which the disease spreads from one colony of bees to another.

MILNE (P. S.). — 1945. **Brood diseases in the three counties.** (*Wilts., Hants, and Dorset Beekeepers Federation 1945 Year Book*, 6-11.)

During 1944, 706 apiaries of bees in Wilts., Hants., and Dorset were visited by officers appointed under the Foul Brood Disease of Bees Order, and 2,253 colonies of bees in these apiaries were examined. Foul Brood was found to be present in approximately 1 in 4 of the apiaries visited, and in 1 in 8 of the colonies examined. For England and Wales as a whole the corresponding figures are 1 in 6 and 1 in 14 respectively, based on reports from 52 counties and on inspection of 23,000 colonies of bees in 6,000 apiaries.

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