The Australian bee bulletin. Vol. 16, no. 11 February 28, 1908

West Maitland, N.S.W.: E. Tipper, February 28, 1908

Registered at the General Post Office Sydney for transmission by post as a Newspaper

THE AUSTRALIAN Bee Bulletin.

A MONTHLY JOURNAL, DEVOTED TO BEE-KEEPING.
Edited and Published by E. TIPPER, West Maitland; Apiary, Willow Tree, N.S.W
Circulated in all the Australian Colonies, New Zealand, & Cape of Good Hope.

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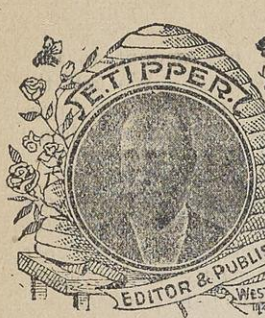

THE AUSTRALIAN BEE BULLETIN.

A MONTHLY JOURNAL
Devoted to Beekeeping —
Circulated throughout the Commonwealth of Australia — New Zealand & Cape of Good Hope

MAITLAND, N.S.W.—FEB. 28, 1908.

The following is the list of advertisers in our present issue, all of whom we would recommend our readers to patronise:—

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Francis M. Collier, Port Pirie, South Australia.

WENT to our apiaries on the 13th inst. There had been some lovely rain occasionally, and the day we went there were some heavy showers. On the previous occasion we had cut out a lot of drone comb to prevent swarming, placing it in empty hives, but were not able to take it home. We took this lot home, and hope to get some wax away soon, using our cheese wax press. There were a few blue martins flying about, but we had not brought our gun. A number of the hives had a lot of honey in them, but no honey coming in, we did not attempt to extract, not only on account of the weather, but the fear of robbing. We do not anticipate another flow before the white box in winter, but we feel satisfied if feeding is wanted there are plenty of combs of honey to give any wanting such.

Attention is directed to the liberal offer made to Poultry Breeders and others by the Australian Hen publication. See advertisement elsewhere.

RENDERING WAX.

It being now the end of our honey season we feel the necessity of rendering our wax fit for market. Of drone comb, cut out, old combs from hives and supers that have run down, we have a fair share. Our copper square boiler we utilise. The wax is put into a hessian bag. When well oiled a board, one

inch thick, easily the size of the top of the copper, and with a number of auger-bored holes, is placed on top of the melted stuff. An upright board on top of that board, on which a long pole is placed with one end inserted in a loop on a perpendicular pole in the ground. The other end has on it a 56lb weight. This forces the main board with holes down into the hessian bag, the wax escaping through the holes to the top, and the slumgum pressed into the bag. Left this way for a night a good cake of wax may be taken off in the morning. This is the first melting. Should very much escape through the holes it sticks to the bottom of the cake, and then can be scraped off. In No. 2 operation the cakes are put into the boiler with clean water, a little sulphur dropped in and when well melted again the wax is dipped out with a tea cup, and dropped into tin moulds made purposely for the wax.

Producing Extracted Honey.

The following is written by Mr. E. D. Townsend, a leading Michigan bee-keeper:

"For several years our extracted honey has been graded; that is, our early, white honey for table use, with our system of giving additional upper stories *on top*, any partly-full upper stories are on top at the close of the season, when we do our extracting. Of course, with this way of managing especially as we try to have every upper story possible sealed, and finished, still with all the precaution one can take along this line, with these 50-pound-capacity upper stories, there will be a good many partly full upper stories at the close of the season, the best we can do. The way we manage to get our superior grade of honey that sells for 1 or 2 cents above the market price, is to take off all these partly-full upper stories, and extract them by themselves. As they are all on *top*, this is not much additional labour, and in a good season, this first extracting will not amount to more than one-fourth the crop. We call this grade No. 1, as even this, our lowest grade, is superior to the ordinary honey on the market.

"A way, where one has two extractors, and a little more time, is to set up two extractors, near together for convenience, then run all the partly sealed combs through an extractor before uncapping. In this way, we get a larger per cent. of the superior grade of honey, but it is some more work. With this latter plan the unsealed honey is not of as good quality as our No. 1 mentioned above, and ought to go for some other purpose than table use. This plan of using two extractors, originated with me, and our whole crop at the Kalkaska County yard was handled this way during season of 1905.

"The reason for using two extractors is that the sealed combs of honey would get so cold standing around, waiting their turn, that it would be impossible to extract the honey unless it was returned to the bees to be warmed up. If one had artificial heat to apply in the latter case, it would work fine. Some of the slickest, cleanest, dryest combs I ever extracted were heated up artifically.

Producing an article that enables the producer to set the price.

"It will not be necessary to tell the experienced extracted honey producer that this honey, after being left on the hive clear through the season, then, having all the latest-gathered and unsealed honey taken away, and kept in a grade by itself, that we would be likely to get a fine article; more, *it would be the acme of perfection*. Isn't the system very simple? Just add a few more upper-stories, keep giving the bees more comb room clear through the season, then leave it as long as there is no danger of getting dark, or inferior, honey mixed with it, even if it is the last of August, if you have no fall flow, and I assure you, you

will not regret it. You will have an article ina class by itself. To find its value, you do not have to look at a market quotation. *You* make *customers*; there is a *scramble* for it.

"Any one producing the ordinary article of honey one finds on the market, is not only losing much on his *own* crop, but is a very great damage to the fraternity at large. It is an undisputed fact, that every pound of good honey that is put on the market increases the demand for honey, while every pound of inferior honey decreases the demand. Can't you see how the land lays? Have you been producing just the *ordinary* honey in the past? Has the price been unsatisfactory, and the sales slow and far between? If so, there is a better way. The better way is so simple that there is not a particle of excuse, for not practising it. Brother bee-keeper let us produce just a little better honey during 1907 than we did in 1906."

The following are two of Mr. Hutchinson's editorials, taken from the same number of the Review, as they bear directly upon the subject under consideration :

GET GOOD PRICES FOR YOUR HONEY AND DON'T FOOL IT AWAY.

"Last winter and spring were terribly hard on bees; the mortality was great. Then, on top of this, came an almost total failure of the white honey crop. The result is one of the shortest honey crops that this country has experienced in a long time.

"The National pure food law has cut out the glucose competition and largely removed the suspicion of adulteration.

"Coupled with all of the foregoing comes a general advance in the price of nearly all commodities, and bee-keepers certainly ought not to be so far behind the times as to neglect to take advantage of this opportunity; or, rather, to claim what is rightfully theirs. I do not advise the asking of an exorbitant price, even if it could be obtained; and it can't, as honey is a luxury (not a staple like bread, meat and potatoes) and few people will pay a fancy price for it.

"Under these circumstances, I think strictly first-class, white, extracted honey should bring 10 cents at wholesale, and the same grade of comb honey at least 16 cents. I believe any man having any of that grade of honey can secure those prices between now and January if he only holds on to his honey and takes the proper course to secure customers. I am already getting orders for my honey at that price; but there is occasionally a retail dealer who "balks" at that price, saying his trade will not allow him to pay that figure. The prices at which honey has been retailed in the past will not allow such a price at wholesale, but retail prices must be advanced, and there never was an opportunity like the present for advancing them—'there is a reason.' Retail dealers must explain to their customers that bees died largely as the result of the late cold springs, that the clover harvest was almost a failure, and the result is a very short crop with the consequent advance in price. Call attention to the additional fact that the prices of nearly everything are advancing—people *know this*, and can comprehend why the prices of honey should also be advanced. A little careful explanation like this on the part of the retailer will enable him to put the price of honey where it ought to be under the circumstances."

HOW TO GET GOOD PRICES.

"I have urged my readers to ask a good price for their honey, but simply *asking* is not enough. It is a very easy matter to ship off a crop of honey to some dealer, and get the ordinary ruling market price for it. If you wish to secure more than the market price, then some effort must be put forth. In the first place, there must be some *reason* why a good price shall be received. Take my own case,

for instance; my honey is not ordinary honey, it is raspberry honey. Then it is thoroughly ripened—left on the hives weeks after it is capped over—and is thick, rich and delicious; and it is put up in bright, *new* 60-pound cans. It is impossible to produce an article superior to this. Having produced such a fine article, and put a proper price upon it, the next step is to let consumers know about it—advertise it and send out samples. I am now advertising it in three of the bee journals. Of course this cost something, and if a man were to be in the business only a year it might not pay him, but a man can gradually build up a trade, and secure a class of customers that will buy his honey year after year without any advertising. I am now receiving orders from men who bought honey of me last year. They dont even ask for samples; they say, If your honey is like that of last year, you may send me so many cases,' and they send on the cash.

"Now, friends, isn't it worth while to have such a trade? To be able to sell your honey year after year, to the same men—those who are willing to pay you from 1 to 2 cents a pound above market price, and send cash with the order, because they *know* that no finer honey can be produced, and that it is worth what you ask for it? The whole thing can be told in a few words: Produce honey of superior quality, and then let consumers know about it—the latter is fully as important as the first."—"American Bee Journal."

THE BEST BEE.

When I read Mr. W. Reid's anything but kind remarks to me in your last issue I could not help to feel sorry for him, because no one with the truth on his side need to abuse his adversary like he did; and I might be pardoned if I replied likewise, but no—I will not. All I want to say is this: In my reply to Mr. Reid I wrote the word "traits," but it appeared in print as "trials" and "trails." Traits are proving purity, trials and trails are not.

Who has kept and managed one race of bees only, cannot possibly be a judge of any other, but he will find that, when managing another race than the one used to, he has to modify the management considerably if he wants to succeed. Therefore the traits have to be thoroughly studied and must be understood. Each race of bees varies in individual colonies as to industry, etc., but the difference is much greater between two races. The introduction of a few queens proves nothing that they possess *all* the traits of their race; per chance they may be quite indifferent to general habits; thus to form a judgment on such meagre practice is assumptive. Neither is a trial of one season sufficient proof as to "good" or "bad," because what suits one season may not suit another. It requires much more than all that to pronounce a verdict —years of practice and carefnl study. Circumstances and conditions vary so, and it takes more than a life-long study to grasp all thoroughly. Since the Italian bee became known outside their native home there have been various races of bees brought into prominence, some of the dark, others of the yellow kind. None but the Italian has gained the world-wide reputation—they are of the BEST. They possess the most good qualities combined. Every other race has some objectionable defects. Did I bring the Italian bee out with me because I knew no other, or would not get any other to come with me? Has it not been amply demonstrated since that my choice was the best? No other race is going to supplant them!

But the Italian bees require different treatment to the black. They are fast breeders in spring, but later on, if honey comes in plentifully they are apt to crowd the queen for breeding space. Here the

bee-keeper must know his duty, and by judicious management the honey crop is increased, and the stocks are kept in excellent condition. If left unaided, they may almost completely fill the brood combs with honey before winter, which means old bees for winter, when young ones are wanted. They die before young ones hatch in spring. The autumn, then, is the time to provide the bees as they are required to be in spring, and all goes well.

I never copy from books—what I write and have written I have learnt from experience.

W. ABRAM.

Beecroft.

A HONEY FAMINE.

Since writing to you some time ago about the bad time here, I am glad to say matters have altogether changed. We have had fine rains and suitable weather for honey secretion. The difference is remarkable. From August to December it was very changeable and almost every day windy, and no rain worth speaking of since June. The bees, with their best intentions, could not find honey enough to live on. They used up all their stores left them from last season, and then in spite of feeding, they reduced and reduced their breeding space. The empty cells were mostly filled with pollen, especially in hives filled with young unfertile queens; but as bees cannot live on pollen, no matter how plentiful it is there was stagnation. If there had been no pollen, the matter might have been explained; but as a fact I had to cut out combs full of pollen and burn them - as they do not suit for boiling into wax—to give empty cells for the laying queens. In December my stocks were weaker in bees than in September, and not for want of pollen, I repeat, but for want of suitable weather conditions. Gradually a change took place, a little honey came in, and the bees began to breed anew. Pollen did not do it. Then rain, splendid rain came, since when the weather has changed altogether—no more strong wind, but warm, muggy nights, followed by warm days, slight showers now and then, mostly at night, and strange, but true, the bees, as if they knew it, set to work again in their usual style. Now they are likely to swarm, if the conditions continue much longer. Hitherto I only had one swarm, and that with a virgin queen which would have made some belief that I breed non-swarming bees without wanting to. Possibly they are going to make an X through these calculations in this as in other instances. I remember one season some twenty years ago, when not a hive swarmed until the 7th of March, then they started—and what enorm us big swarms! In from 10 to 14 days they filled 10 frames full of comb and honey, having only a little brood in the first few frames near the entrance. Experience is the best teacher and careful observations show that there are other factors than food that influence the progress of the bees. The new school beekeepers have to gain that experience, when they do accord will be possible but until then there are sure to be differences of opinion. Time will tell its tale.

Whilst it was disheartening to handle bees in the early part of the season, it is a pleasure now. Such is the lot of bee-keeping.

W. ABRAM.

Beecroft.

Does the Queen Will the Egg-Sex?

Some maintain that the size of the cell decides automatically the sex of the egg laid in it. To this it is replied that if the cells, are only ⅛ inch deep, the queen still lays the proper egg in the corresponding cell, as a general rule, only sometimes when drone-comb is in the way, and she does not desire to lay drone-eggs, she fills these drone-cells

with fertilised, or worker eggs; and so it is perhaps the general belief that the will of the queen decides whether each egg, as it is laid, shall be impregnated or not.

Dr. Miller, in Gleanings, declares he does not know which theory is correct, but says that in the few cases he has known of worker-eggs being laid in drone-cells the workers have always narrowed the mouths of the cells by making a heavy margin of wax, and wants to know, you know, why it is that if the sex of the egg depends upon the will of the queen she can not will to lay eggs in drone-cells without any bother of first narrowing the mouths of the cells.—"American Bee Journal."

CORRESPONDENCE.

T.R., Leongatha.—I like your journal well. I wish we could get an apiaries' act passed in Victoria similar to that of New Zealand, vide your last issue. Something of the kind is badly wanted. A feature of this season is a second blooming of the clovers in this district. Strawberry clover still out in flower and bees working hard. Quality A1. I placed a fair exhibit at our local show last week, I am forwarding local paper's account of same (not written by a bee-man, observe the finish). "Mr. T. Rayment, of Queenlie Apiary showed a very modern and extensive beekeeper's device, ranging from the latest scientific method of rearing queen bees down to a nicely designed honey extractor; and the latest framed articles for the bee-farm imported from the A. I. U. Co., and a glass-observation hiving apparatus." Re Abram v. Beuhne, I have noticed queens from the warm climates do no good in the cold wet districts of Gipps.

W.J.B., Clarence River.—My bees are now doing very well. We have had splendid rain lately which has, needless to say, improved things wonderfully, and I will have a very fair honey season after all. I notice in last issue of the "A. B. Bulletin" an article "Experience with the American Gold Bee." I have had considerable experience with this particular class of bee, and I cannot recommend them to any beekeeper who wants to make a living from his bees; their only "merit" that I could find is beauty. Something more than that is wanted. I have improved these bees considerably by crossing them with the Ligurians. This cross makes them hardier and fairly good honey-gatherers. In their pure state it is a very difficult matter to bring them through the winter, in fact I have had them die completely out, and those that did manage to "pull through" were late in the season before you could say that they were in good working order. It appears to me that these "Golden Beauties" have been bred too much for color, and their constitution is so weak, that they are useless for anything but to look at.

[This is quite in accordanee with our own experience.—Ed.]

BEES "BALLING" QUEENS.

Some time ago I related how a runaway swarm of Golden bees "balled" their queen three weeks after hiving, during which period no eggs had been laid. When these bees had "balled" their queen I started them to work rearing queens on the artificial cup method, and during this queen-rearing a curious incident occurred. Close beside this hive was a small nucleus colony with a virgin queen. She was three weeks old and unmated, and one Thursday this little colony, queen and all, disappeared! On the following Monday, about one o'clock, I noticed a great commotion at my queen-rearing hive, and on opening it to ascertain the cause I found the lost

virgin queen in a "ball" of bees. I recognised this queen by her having one yellow band. She could not have been in this hive during the intervening four days, because these bees had been busy making queen-cells all the time. The question arises: Where had she been in the interval?

During August and September last I had four cases in my apiary in which nucleus colonies of three or four frames of bees "balled" their own young fertile queens during examination. In the first case I rescued the queen and caged her on a comb for twenty-four hours, releasing her on the afternoon of the next day, but they subsequently killed her. In the second case I rescued the queen and caged her on a comb for two days, releasing her in the evening; she was saved. In the third case, after rescuing the queen, I dusted her with flour, and then put her back in the hive. A few minutes afterwards, by the manifest excitement of the bees, I concluded they were again "balling her. Upon examination this was found to be the case. I then gave the "ball" a good dose of smoke, put on the quilts, and applied the smoker again, giving a good dose at the entrance twice; the bees then quietened down, and this queen was also saved. In the fourth case, as soon as the "balling" was noticed, I parted the "ball" of bees to see if the queen was really inside. On discovering her I put on the quilts, and gave the bees two good doses of smoke at the entrance, with an interval of then minutes between the doses. This queen also survived.

In all these four cases the manipulation and "balling" took place in the middle of the day, and in each instance robbers were much in evidence.

My observations lead me to consider that these colonies at that moment were over-excited through having to defend themselves from robbers.

No cases of "balling" have occurred with me where the manipulation took place early in the morning or in the evening; neither does it happen with strong colonies covering over seven frames of bees. It seems clear that the trouble and loss are caused by the combination of "robbing" and manipulation in colonies not over strong, the bees of which at the moment of opening the hive are excitedly defending themselves against robbers.—Writer in "British Bee Journal."

Man Attacked by Bees.

A young man named Trunkett was attacked by bees at Wangaratta (Vic.) on Sunday, February 16, whilst attempting to rob a hive in the limb of a tree 40ft. from the ground. The insects settled on his legs, face, and other exposed portions of his body. His boots, hat, and coat had been removed before his ascent.

He was in this painful position nearly 10 minutes until some friends arrived. They succeeded in throwing a rope round the limb on which Trunkett was seated, and hoisted a bag, with which he was able to beat off many of the bees.

In desperation he threw a bag which contained a large number of insects over his head, and, grasping the rope, slid to the ground. Trunkett collapsed, and remained unconscious for half an hour, but a vigorous rubbing with whisky seemed to have a good effect in removing the poison of the stings.

Trunkett has practically recovered, but he still bears traces of his painful experience, his feet being swollen to an abnormal size.

Spring Stimulation of Brood-Rearing.

Allen Latham says in the "American Bee Keeper:"

"Few bee-keepers escape and fewer resist the temptation to practice brood-stimulation in spring. Some succeed apparently in their efforts and tell of their success, while many fail and say nothing about their failures. That brood stimulation is a matter to be let

alone—let severely alone—by the novice is acknowledged by all who are honest in their advice and to their own conviction."

In support of his belief he then relates how, during the past inclement spring, he gave special care to the bees in his home apiary, while 8 colonies a mile and a half away were left severely alone, and these neglected colonies came out stronger than the others. The neglected colonies were in larger hives than the others, and the question may be raised whether this item made no difference.

PRICES OF HONEY.

Melbourne Leader.—Honey.—Prime clear garden lots are quoted at from 2½d to 2¾d, and medium to good descriptions are offering in plenty at from 2d to 2¼d. Beeswax.—Prime is quoted up to 1/2, and medium to good, more or less discolored, at down to 1/-.

Australasian.—Honey.—Prime clear extracted in fair demand, 2½d to 2¾d per lb.; congealed and inferior dull of sale at lower figures.

Sydney Telegraph.—Honey.—Sixty-pound tins of choice western, 3d; prime 2½d to 2¾d; good, 2d to 2¼d per lt.; inferior, lower. Beeswax.—Prime clear, 1/3 to 1/4; dark, 1/3 per lb.

HONEY.—

Sales are slack at the present time, but we expect an improvement in the near future. Choice Western district is selling from 2¾d. to 3d., medium and dark lots from 2d. to 2½d.

BEESWAX.—

This line is lower. Dark lots 1/2; choice up to 1/3.

Food Value of Honey as Compared with other Food Stuffs.

BY PROF. G. L. TANZER, PH.G.

No question affecting the human race is of so much importance as that of food stuffs. Evolutionists are well aware of the fact that the two great forces—the two great agencies—by which animal species were evolved, the one from the other, and the human race from them all, are food and climate. With the latter we have nothing to do at this time, and with the former we are only to consider briefly one of the many food compounds which is offered for the appropriation of men and women, to-wit, that of honey.

It is evident to my understanding that the whole question of food stuffs is to engage the attention of scientific men in the near future, not only from the old standpoints of pure physics, but from the newer view-point of the psychological welfare of our race.

Up to the present time whatever research scientific men have made regarding the value or adaptability of foods has resulted exclusively in determining their utility in assimilation by the bodily organs of digestion and assimilation as to purely physical results.

It is fair to say that we are progressing as a race, and rising to higher summits of knowledge and experience. The time is rapidly approaching when the value of food stuffs to be appropriated by human being will be determined not only with reference to their purely physical results, but also with reference to that assimilation of foods, which reached out to the building up of higher faculties.

Science is already disclosing to our vision that there is a wonderful interdependence of the life foods appropriated by a life organisation. We know there is not a square inch, so to speak, of any surface of the exterior of the human body that does not contain scores of hungry mouths that are constantly devouring foods, and these foods comprehend all substance from magnetism to heat, harmony and light, or colors Hence we see that the assimilation of food in a life organisation, such as a human being, reaches to all of the qualities of substances of our universe.

Holding our subject in thought from this standpoint, we see at once that science has a mighty work on hand in determining what so-called bodily foods, or foods appropriated through the stomach, will best assimilate through the bodily organs, in conjunction with the other foods I have named, so as not only to produce the best physical results in and for the physical bodily organs, but the best contributions to the upbuilding of the psychological organisation of the man or woman

It is within our knowledge that many of the so-called bodily foods work out in their assimilation injury to the mental and psychological welfare. I am of the opinion that nearly one half of the volume of so-called bodily foods and drinks now appropriated bring about these regretful results, and that they should be discontinued by people generally, as rapidly as possible. I will further state that it is my opinion that the next quarter of a century will witness the abandonment of a great many of the foods now appropriated and will demonstrate that the people generally especially those who enjoy the higher plains of civilization, are devouring or appropriating, so far as volume, bulk, and variety are concerned, more than double that which they should appropriate.

Men and women are eating too much, speaking from the standpoint of quantity, and are overloading the physical machinery and thereby chaining their lives to the physical, whereas by a better selection of food stuffs, they will more rapidly rise in the scale of our destined life qualities.

There are three classes of food stuffs to which I desire to direct your attention. These are honey, eggs and milk.

It is remarkable that these foods are compounded for the consumption of the human race by the three great divisions of the animal kingdom, to wit, by the insect, the bird and the mammal tribe. The bee provides the honey, the bird produces the egg, and the mammal yields to us the milk.

It is scarcely necessary to point out to you the fact that with the exception of certain vegetables, these three food stuffs rank higher than any others known to scientific research. We find from statistics that the relative value of these three foods, that is to say, the relative fuel value of them per pound in calories, is as follows:

1. Honey	1520 calories
2. Hen's eggs uncooked average ..	720 calories
Hens' eggs boiled, average	765 calories
3. Milk average of market product ..	325 calories

I should observe in this connection that the yolk of the egg when boiled has an average of 1705 calories and has an exceedingly high fuel value. It will be seen, however, that honey stands pre-eminently at the head of this list as a fuel or energy-giving value. But let me say in addition to this, honey stands transcendently higher than the other two as a life-giving food from the standpoint of its power of assimilation in supporting and developing the higher faculties of a human life organisation. This partly arises from the fact that, while milk and eggs contain a considerable percentage of animal substance, honey is composed almost entirely of vegetable substance of a higher quality, including only such exceedingly small traces of mineral substance, and that of such a quality as to contribute to its tonic value. We do not appropriate as food the flesh of the insect, from the laboratory of whose body the honey is compounded, but we do appropriate as food the flesh of the fowl, in the laboratory of whose body the egg is compounded. We also appropriate as food the flesh of the mammel, in the laboratory of whose body the milk is compounded. Better by far for the human race, if men and women generally would eschew completely the two latter classes of food stuffs.

Pure honey is a syrupy liquid of a light yellowish, to pale yellowish-brown colour. It is translucent when fresh, but gradually becomes opaque and crystalline, having a characteristic aromatic odor and a sweet, faintly acrid taste.

Analyses of honey vary somewhat in their composition, due to climatic conditions, and the sources of supply.

The average composition is as follows:

Dextrose	34.4
Levulose	39.2
Dextrine	4.0
Mineral substance ..	0.2
Formic acid	0.2
Water	22.0
	100.0

Let me call your attention to some observations concerning honey contained in the United States Dispensatory, a large volume well-known to all chemists and druggists This work, which is a standard book of science, behind which are such names as Dr. George B. Wood and Dr. Franklin Bache, is now in its eighteenth edition, and I regret to say it is not up-to-date, not abreast with scientific research in regard to honey. On one of its pages it states that naturalists have not yet determined whether it is a secretion of the bee (apis melifica,) or exists already formed in plants. This work further says that honey probably undergoes a change in the organs of the bee, as the saccharine matter of the nectaries, so far as it is possible to examine them, lacks some of the characteristic properties of honey.

Now, let me explain to you just how honey is manufactured, or compounded, if prefer that word. Let us see just what you part the bee performs in its work and what part the flower performs. Modern science has determined that honey is the result of fermentation, and that it is not secreted as honey by the flowers. The first bee that visits a flower and enters its petal does not obtain any honey. The bee simply makes a scratch at the base of the petal so as to set at liberty the sap of the flower. After the bee has lanced the flower, it begins to "bleed," or to emit the sap. This emitted sap contains traces of starch. This sap thus exudated undergoes fermentation. When this takes place the compound honey is the result. Now, the fermenting element was contributed by the bee when it first visited the flower, but when it did not obtain any honey. After a little time the first bee, that contributed the fermenting element, was succeeded by another, which obtained the honey. Thus it will be seen that the honey does not all come from the flower, although nearly the whole volume of its substance does proceed from the flower, but that a leaven, which leveneth the whole lump, is contributed from the life organisation of the bee itself. Thus the force or principal in the honey is the product of the bee, and this sub-store of honey, like the yeast in the bread, and like spirit in life, is the active, life-giving element of the compound, which renders it unlike any other compound in the universe, and as such the most potent and the highest contributor to a human life organisation.

It is indeed gratifying to observe the inauguration of a campaign to educate the public of the great merits of honey, as a food product, and it is to be hoped that the praiseworthy efforts of the agricultural press with the exhibit of the bee-keepers' associations of the Western and Northwestern States, at the Portland exhibition, will result in bringing this product into greater prominence and daily use in every household.

A good deal has been said about honey pro and con, and it cannot be denied that to a great extent, the public mind has been influenced – unjustly influenced—against the use of this wholesome and nourishing food product, by constant cries of adulteration, and again by the publication of articles of alleged cases of poisoning by honey.

Let me call your attention to a well known handbook for pharmacists and physicians, written by Prof. Joseph Remington, one of the prominent pharmacists of the country and a professor of a pharmaceutical college. We find under the head of "Mel" (honey) the following:

"Large quantities of honey are obtained from California, the southern States and the West Indies. A still larger amount, however, is manufactured by flavouring and coloring artificial glucose." Further on he states: "Owing to the difficulty of obtaining pure honey in large cities and towns, its place in many medicinal preparations has been filled by substituting syrups or glycerine."

Can there be anything more astonishing than such a statement? Think of it for a moment. Honey substituted by syrup or glycerine in drug stores, where the term substitution should not be known, and should certainly never be practiced.

If some unscrupulous persons have in the past made, or even continue to make, or practice adulteration of honey, it would be far more satisfactory and just to all parties to locate and prosecute the offenders instead of discouraging the use of this splendid food product, by the circulation of such literature.

Regarding some cases of poisoning by honey, which occurred in New Jersey and other States, it can be said that no case of poisoning by honey would be on record if some care were exercised in not

placing an apiary in a locality where many of the Ericaceae abound, even though it appears to be an ideal spot otherwise, as it is well known that honey produced by bees having access to certain Ericaceae, acts as a narcotica-irritant.

However, such a poisonous product can generally be distinguished readily, because it never thickens; the colour is redder than usual, and the honey emits a peculiar smell which immediately produces sneezing.

There is absolutely no reason why the public should hesitate to cast aside their suspicion with regard to honey, because no honey can be adulterated in such a way as to correspond to the genuine article in every detail. The chemical analysis may fail to detect the adulteration, but the spectroscope cannot be cheated.

We will now direct our attention to the fuel value of honey as compared with meat and some agricultural and horticultural products.

By fuel value is meant the number of calories of heat equivalent to the energy which it is assumed the body would be able to obtain from one pound of a given food material, provided the nutrients of the latter were completely digested:

FUEL VALUE.

	Calories.
Honey, average ..	.. 1520
Green Butter Beans, average	.. 370
Green Lima Beans, average	.. 255
Dried Lima Beans, average	.. 1625
String Beans (cooked) average	.. 95
Beets (fresh) average ..	.. 215
Cabbage, average ..	.. 145
Cauliflower, average ..	.. 140
Corn (green) average ..	.. 470
Cucumbers, average ..	.. 80
Kohl-rabi, average ..	.. 145
Mushrooms, average ..	.. 210
Peas (green) average ..	.. 465
Peas (dried) average ..	.. 1655
Potatoes (raw) average ..	.. 385
Potatoes (boiled) average	.. 440
Sweet Potatoes (cooked) average..	925
Pumpkins, average ..	.. 120
Saurkraut, average ..	.. 125
Spinach, average ..	.. 260
Butter (market product)..	.. 3605
Sugar (market product)..	.. 1860
Sugar (maple).. ..	.. 1330

The fuel value of fresh fruits is almost the same as of vegetables and I will state but a few of them for the sake of comparison:

	Calories.
Apples, average.. ..	.. 290
Apricots, average ..	.. 270
Bananas, average ..	.. 460
Cherries, average ..	.. 365
Figs, average	.. 380
Grapes, average ..	: 450
Orange, average ..	.. 240
Pears, average	.. 295
Plums, average.. ..	.. 395
Watermelons, average ..	.. 140

ANIMAL FOOD.

Roast Beef, average ..	.. 1620
Round Steak, average ..	.. 840
Sirloin Steak, average ..	.. 875
Corned Beef, average ..	.. 1271

Now, it can readily be seen that the fuel value of honey exceeds some animal foods and a great many vegetables and fruits, and has the advantage of being more readily digested and assimilated than the majority of the articles mentioned.

Speaking from a medical point of view, it is a well-known fact that honey has been used with great advantage for the cure of coughs and colds. It has been a favoured remedy of the old-time practitioners, who no doubt would have strenuously objected to a substitution by syrups or any other substance.

In justice to the up-to-date druggist, it may be stated, that but few adopt such practices, as set forth in the handbook named, and only on very rare occasions

are such substitutions practised. It is safe to say that at least in this State, there will not be found a single druggist who does not keep a quantity of strictly pure honey in stock for dispensing purposes.

In this connection permit me again to say, that the science of physics does not exercise a complete mastery over the substance of food stuffs. Science in this respect can reach, to determine their qualities, only the coarser physical elements. We must ascertain the nature of the elements contained in any food compound, not only from the standpoint of natural history science, but from the viewpoint of natural philosophy. The higher elements in a food compound may be the most potent life giving and life-extending factors in that compound. Thus it is that honey, as we have already seen, in all of the elements of its finer and higher substances can not be brought to vision, even by the science of optics. We must arrive at the fact of their existence in another way.

However, enough has been said to demonstrate clearly that honey ranks high as a food, and used in the proper, connections with other food stuffs, it may be regarded as, in actuality it is, one of the most complete solvents for assimilation that can be appropriated in the human stomach.—*American Bee Journal.*

How Swarms Choose a Location.

A Few Incidents to Prove that Scouts are Sent out after the Bees are Clustered.

BY G. C. GREINER.

If I am not mistaken, is the general opinion of all experienced beekeepers that young swarms before leaving the old premises, send out scouts in search of a suitable place to start housekeeping again. I have always kept a number of decoy hives scattered in and near my apiary to catch stray swarms. The result has been quite gratifying. Almost every year I have had one or two such swarms take up their abode in one of these hives and occasionally one of my own swarms would hive itself in one of them. My experience during the last twenty-five years or more has established the "scout" theory—a settled question in my mind; but not until this past season did I have the opportunity to make observation along this line that may be accepted as positive proof.

The condition of my apiary during the fore part of the season was something like this: After a heavy winter loss, which, by the way made itself conspicuous after the 25th of March, when all my bees, with very few exceptions, brought pollen freely, a large share of my outfit consisted of depopulated hives scattered all through the apiary. As soon as any colonies were discovered missing, their hives and combs were thoroughly cleaned, combs containing honey of any amount sorted out, and the hives with the empty combs left on the old stands. The entrances of all these hives were left open full width, and in walking through the yard a very few bees could be noticed going very quietly in and out of some of these hives at any time. In the forenoon of June 10th I noticed at one of the hives an uncommon commotion. A dozen or two of bees were running in and out of the entrance in a seemingly greatly excited state of mind. Some were on the sides and back trying every joint to find an entrance, and the whole affair had the appearance of a very severe case of robbing. At first I mistrusted that some of my bees had found overlooked honey that caused them to make this display, but found, on opening the hive, that that was not the case. Instead I noticed another dozen or two running up and down the combs in the same excited condition. I also noticed, what afterward proved to be conclusive evidence, that all the bees were a very fair type of Italians, not one black one among them.

As I was quite interested in their queer behaviour I watched them all the afternoon and forenoon of the next day, without seeing any change on their part. About two o'clock, while looking at them again, I heard in a southerly direction, where, at a distance of half a mile, an elm grove is located, a faint rumbling noice, and at the same time a few flying bees made their appearance. The rumbling as well as the bees increased at a rapid rate, and in less time than it takes to write it I was surrounded by a swarm of bees. After circling around for a few minutes they began to thicken over the hives of the previous excitement, and soon this one and the adjoining ones were covered with bees. As they began to enter, their preference seemed to be centred on that particular hive. The few that had entered the others soon left again and joined the multitude, where almost instantly, house cleaning was made the order of the day. The swarm proved to be of the same type as the bees that had been to work at the hive before they arrived—purely marked Italians.

A few days later, June 16, just the same incident took place, with the exception that the scouts were black bees, and that the swarm came the same day that I noticed them investigating another hive. They arrived at about the same hour, between two and three o'clock. The swarm as well as the scouts tallied with one another. They were all of black German blood.

It may begin to look like a big story when I say that, two days later, a third swarm adopted another one of my hives for its home under similar circumstances. Nevertheless, this was the case, and I have to stretch it still further. A fourth one came to me the 23rd, and still another the 7th of July, making all in all five swarms that availed themselves of my hospitality during this season.

The facts which I have gathered in connection with this subject would indicate that, as a rule, bees cluster before they send out scouts; or, if scouts are sent out before they swarm, they cluster before they leave for their new home. Although some of my own bees took possession of an empty hive directly before clustering, my observations during this campaign seem to oppose our accepting it as a rule. All five swarms arrived here in the afternoon between two and three o'clock, after they had plenty of time after swarming to cluster, send out scouts, and wait for their return before leaving, while all my own young swarms issued in the forenoon. The latter all clustered in the usual way, waiting for me to provide homes when they all had the same chance to help themselves to any of my empty hives as the stray swarms. If scouts had been in search before swarming, why did my swarms, or some of them at least, not hive themselves?

This would show that sending out scouts is a matter of compulsion. If bees are neglected by their master, and left hanging in a tree indefinitely, they have no alternative but to provide a home of their home. Then is the time they make use of the scouting gang; and as soon as they have found a suitable place, and have communicated the news to the clustering swarm, away they go, and no common means will stop them.

Sometimes I had swarms leave for parts unknown after clustering, when I was a little too slow in getting ready to hive them. In such a case scouts might have been out before swarming, or else they ran across something suitable in short order; but the swarm clusters before leaving, just the same.

As an exception it may stated, and I had a little experience in that direction too, that young swarms "light right out" without stopping to cluster. Then,

of course, it may be accepted as a probability that scouts had been successful in finding and preparing a home before the warm issued.

There is still another case in this connection that might be mentioned. Once in a great while a swarm, after being hived in the customary way, and remaining seemingly contented for a day or two, will unceremoniously leave for other quarters. If their scouts had been sent out when the swarm first clustered, they would have been on an exploring expedition a long time—too long to make it seem probable. Besides, tracing the swarm to its new location, which may be some distance from the old clustering-place, might cause them some trouble. I am rather inclined to think that, during their brief stay in their new home, they became discontented for one reason or another; and, to gratify their notion, scouts had secured a place more to their liking. That they knew where they were going when leaving, would be an acceptable conclusion from the fact that I have followed them directly to a hollow tree.

The number of bees that are detailed for scout duty by the swarm, I have found to range from fifty to seventy-five, with every one of my first three swarms. If other gangs are employed at the same time in different places, the above numbers would be increased accordingly. I can not give particulars in regard to the other two, as I was not present when they made their display, but found them in proper working order at night.—"Gleanings."

Syrup For Feeding Bees.

BY OTTO LUNDORFF.

Many beekeepers will have to feed their bees again. We hear often of sour honey in combs, of bees perishing during winter, and often people do not know what the cause of it is. If bees are short of stores, sugar syrup properly made is about as good as the best honey; but not properly made, as for instance is recommended in some catalogues for many years, it may often cause disaster. A certain one has this:

"If you are careless enough to let your feeding go till late, use 4 parts sugar and three of water, and ¼ pint of vinegar, or 10 pounds of good honey, to the 100 pounds of syrup, to prevent granulation," etc.

I beg to make the following remarks concerning this recipe:

Most vinegar of beekeepers is probably made at home by natural fermentation, and this same product is handled by many storekeepers. Such vinegars, if not pasteurized, contain generally small quantities of fungi which will cause later sour fermentation of the thin honey. Great quantities of commercial vinegar are made from wood by distillation, and these are healthy and save, they contain no ferment. If the vinegar naturally fermented is heated up to 55 degrees Celsius, or 131 degrees Fahrenheit, all fungi will be destroyed, and as long as no new fungi are formed the vinegar is healthy and safe.

The addition of vinegar is recommended to cause the cane-sugar to go over into an article similar to honey—in other words, to change the saccharose ($C_{12}H_{22}O_{11}$) into dextrose (plus $C_6H_{12}O_6$) and levulose ($-C_6H_{12}O_6$).

But we can accomplish this same result without the dangerous vinegar, and with absolute safety, if we take tartaric acid or citric acid in place of vinegar.

A proper and safe recipe is: 100 pounds best cane-sugar, 100 pounds water, and 1-10 pound tartaric acid or citric acid. This should be boiled slowly from 2 to 3 hours.

Late in the season the quantity of water may be reduced, leaving the other parts in the same proportion.—"American Bee Journal."

Wonderful Organs of the Bee.

BY PROF. A. J. COOK.

We often refer to man as at the head of all God's creation, and I doubt not but this is true, only, however, as the greatest development of man—the brain—stands in our estimation as the highest part of the animal organism. Man is pre-eminent only in brain and hand. I am free to say that in variety or function the honey-bee stands first—ahead even of man himself. As function must have organs, and special development, so we are not surprised at the wonderful developments that we find in our study of the honey-bee.

The bee gathers honey and must have special organs, and does have marvelous development to do this work. We know how the bee can get honey from the deep flower-tubes, from a surface on which the nectar is thinly spread, and as easily, and more quickly, from a huge nectar-drop, such as is seen in the linden-bloom and in the figwort, and of course there must be, as we know that there is, a marvelous development of tongue and mouth organs to accomplish all of this. Man has learned, through the supremacy of his brain, to discount the bee in what he does—its range and reach. Yet man has not to depend upon his modified organs to do his marvels—he fashions the means. He makes his knife and chisel, while in the case of the bee the knife and chisel are a part of the bee herself.

The bee gathers propolis or bee-glue, and has her own cart as a part of her bodily equipment, and has not to make it of wood and iron. The same equipment is used also to carry the pollen, and other proteid food. In case of the pollen, there are additions, like pockets—brushes, curiously modified hairs, all useful to collect and carry the pollen, which is the special and peculiar food-element of all bees. Indeed we might almost describe the great family of bees as that family of insects that live wholly or largely on pollen.

But there is another feature of bees that is in some respects more interesting than all, as it concerns the formation of a very peculiar secretion—wax—and its manipulations to form comb. We should expect that this would call for extra modification of organs and parts. We know that comb is one of the most exquisite and delicate structures known to man, and so anything that concerns its origin and formation is, and must be, a subject of great interest.

Wax-Glands.

Glands are the organs of secretion. Our spittle comes from the salivary glands. The function of a gland is to take from the blood elements and form the secretion. The secretion is not in the blood, but its elements are, and the gland has the wonderful power to select, from the great nourishing fluid, just the substances that are needed to form the special secretion.

The special agents of the gland that do this work are the cells. There are in every considerable gland, thousands, often millions, of the little cells—the real workers—that do this important service. Cells are the most important part of plant or animal, as all the work of every kind performed in the body is done by the cells. We have in an egg—really the yolk, the real egg—an example of a cell The blood discs or corpuscles are other illustrations, and the individuals of the entire branch of animals known as Protozoa, consist of a single cell. While almost all of these Protozoans are microscopic, and so very minute, there are some that can be seen without the magnifier. The very minute Sporozoan, that causes malaria, is one of these protozoans, and so is just a cell, and so very small, that we can only see it as it is magnified many thousand times.

The wax from which the incomparable comb is formed, comes from glands that are situated on the under side of the worker-bee, just back of the thorax. These are racemose glands, and are much

like a bunch of grapes in appearance. Of course, the grapes, in this case, are very minute, and represent—or are little sacks, the walls of which are formed by the cells already described. The stems of the grapes, and the larger stems, are represented in the glands by ducts, or tubes which carry the secretion off. There are four of these glands on each side, and so there are formed eight wax-scales at a time.

I suppose that all glands have times of rest. In many cases we know they are inactive at times. We know that our salivary glands are only active when we are eating, and the saliva or spittle is needed. Milk-glands are only active at times of tactation, and then it is probable that only a part of the cells are active, at any one time. It is curious about the wax-glands of bees. They would seem to be wholly under control of the bee. When wax is needed, as when there is a lack of comb, and more is to be made, then most, if not all, of the bees are secreting the wax-scales. As in all cases that we know of, the action of glands is wholly involuntary, we may be pretty sure that wax-secretion is involuntary on the part of bees.

I have often wondered how it is that the bee has, or seems to have, control of this matter of wax-secretion. We all know that when the bees need much wax, they cluster in absolute quiet in the top of the hive. In case they have just swarmed—and this is usually the case when they stand in greatest need of comb, and so of wax—they have just filled their stomach—honey-stomach—to repletion with honey. I am inclined to the opinion that the full stomach, or surfeit of food, and the stay in all exercise, give the wax-secretion.

We all have just about so much energy. If we spend this energy in one way, we can not spend it in any other. If we fret and worry we can do less work; if our cattle are chased by dogs, the cows will lose materially in milk. I once milked a great shortcorn cow on my Owosso, Mich., farm, and secured 14 quarts of milk. She was a very large, heavy cow, in full flesh. The next two days I led her to the Michigan Agricultural College. I took two whole days for this, and went very slow, as I wished to do her no harm. I thought that she could go safely 14 miles a day. The night of the second day she gave less than three quarts of milk. She did not get over the strain all the year through. I believe that the bees have about so much energy, gauged by the amount of food that they eat and digest. If they cease from exercise, then this energy goes to wax-secretion, and we get the wax-scales and material for the comb. If this is correct, then the bees simply regulate wax-secretion by regulation of habits. Much food and great quiet means wax.—"American Bee Journal."

Have Bees Reasoning Powers.

BY W. H. LAWS IN "AMERICAN BEE JOURNAL."

A few years ago in company with a neighbor bee-keeper, we drove to his apiary on the Nueces River. Casting our eyes about the apiary we spied a large swarm of bees hanging on a limb about 6 or 7 feet from the ground. Taking a hive, we at once prepared to hive it. On examination we found the bees had built several large sheets of comb, as I remember, the centre one was nearly as large as a dinner-dish. And there was an abundance of sealed brood some little honey over the present needs of the colony. This was about sunset, and on disturbing the swarm, and they promptly showed fight and gave us to understand they regarded that spot as their home. Seeing some transferring had to be done, we posponed the job until morning. Other important work in the apiary prevented immediate attention to the swarm, and before again disturbing them in the least the whole swarm (not leaving a bee) decamped to parts unknown, about 10 a. m., leaving their babies and a little honey also.

Why did those bees leave? Did our disturbing them on the previous evening cause suspicion? or had their pasturage become short and exposure to depredations of robber-bees and other pilferers, caused it? Perhaps they reasoned thus: "Shall we stay here on this bush and risk our life as a colony, or shall we desert our babies and all this 10 or 15 days' labor, and go to some hollow tree where we can begin anew and be in position to protect our labor and a new crop of babies."

There must have been some mental decision, and each member of that swarm must have accorded with that decision. I have seen large bodies of men ponder for days on matters of much less importance, and never reach a decision. Shall we accord to the bees a greater reasoning faculty than man—that personage whom, it is said, God endowed with the highest and greatest of reasoning faculties.—"American Bee Journal."

Reviews of Foreign Bee-Journals.

By "Nemo."

Difference between Carniolan and Caucasian Bees.—M. E. Bondonneau, the editor of "L'Apiculture Nouvelle," in reply to a correspondent, says that Carniolan and Caucasian bees are very similar both in character and appearance. Carniolans are not quite so gentle, a trifle larger, and as to colour are rather bluish-blach than blackish-brown like the Caucasians. The latter introduce large quantities of propolis into their hives and between the frames at certain seasons, whereas Carniolans hardly ever do so. Then, again, Caucasians are no better than the black for keeping out wax-moth whereas Corniolans are as good as Italians in this respect, and know how to defend themselves against this enemy. In other respects the two races resemble each other, and generally they are easily mistaken.

Formic Acid in Honey.—M. Reidenbach has stated that formic acid was produced in brood-cells, but Dr. Bruennich points out in "Schweitzerische Bienenzeitung" that this theory cannot be sustained. The careful investigations of Dr. A. de Planta have clearly demonstrated its origin in the blood. A fact that controverts Reidenbach's theory is that formic acid is not found in the nectar of flowers, but it appears in the nectar when taken from the honey-sac of the bee and before it is converted into honey.

Black Brood.—We read in the "Schweitzerische Bienzeitung" that this disease has made its appearance in the canton Aagau, so that it is gradually spreading over the Continent of Europe, and bee-keepers should be on the watch to prevent its getting a firm footing in an apiary.

In the same journal the returns are published of the amount of honey harvested in different cantons. These returns come from 262 different places and state the principal source from which the honey is derived, the quality of the harvest, whether good, bad, or moderate, the average per hive, and the largest amount from one hive, as well as the condition of the colonies at close of harvest. The largest quantity of honey gathered by one colony was 70 kilos (154½ lb.), at Itingen in canton Bale.

Isle of Wight Bee Disease.—There is a report in the "Praktischer Wegweiser" of the observations carried on at sixteen stations in the Province of Brandenburg. The reporter, M. Kranepuhl, describes an outbreak of disease at Neudamm, one of the stations, and asks if this is not the same as the disease in the Isle of Wight, which has been described in the "British Bee Journal" and reproduced on pages 267 and 306 of the "Praktischer Wegweiser." He says the observation-hive at Station 10 was destroyed by a hitherto unknown and apparently dangerous disease M. Schmidt, the observer, writes respecting it:—"The bees cluster together and die, are unable to fly, just as with the May pest, and the body was filled with a hard mass of pollen.

Brood died just as in foul brood. As the colony died out from this disease the hive and contents were burned." Up to the present the disease has not spread to other colonies. After submitting samples to the Biological Institute for examination, it was pronounced not to be foul brood.

New Bee Journals.—In Italy a new bee-journal has been started, called "L'Avvenire Apicola," in the first number of which it is stated that its object is to give public instruction in bee-keeping, to promote legislation and suppressing the strifling of bees. In Spain two new papers have appeared—"La Gaceta Apicola de Espana" and "La Apicultora Espana"—and these replace "El Colmenero" and "El Apicoltor, which have ceased to appear.

Composition of Nectar.—M. T. Weippl says in "Illustrierte Monatsblatter" that nectar is composed of from 60 to 80 per cent. of water, in which cane-sugar is disolved, together with dextrin, mannite, gums, and esential oils, which give the aroma. The amount of nectar in plants is increased after rain, and is diminished in dry weather. For instance, in the fuchsia during showery weather there are 40 to 70 mm., but after three dry days there would be about 15 mm. The further one goes north from the equator the larger the amount of nectar secreted, and the sames takes place in respect to height. The same plants, therefore, in the mountains secrete more nectar than those in the valleys

One floret of red clover contains 7.93 mg. of nectar, 125 florets therefore produce 1 gramme, 125,000 1 kilo. Each head of clover consists of about 60 florets. therefore the bees must visit 7,500,000 florets to bring home 1 kilo of nectar.

Nectar is produced in the flowers only so long as fertilisation has not taken place, and as soon as this has been accomplished the flow of nectar ceases.

In the same journal the length of a common worker's tongue is given as 6.21 mm., and according to measurements made by M. Kulagin the lengths vary from 5.22 to 6.69 mm. He says the tongue of the Russian bee is 6.21 mm., of the American red clover bee 6.22 mm., of the Italian bee 6.25 mm., and of the Cyprian bee 6.50 mm. Practically there is no difference.

The Importance of Pollen.

Referring to the paper read by Mr. Geo. Hayes at the late B.B.K.A. Conversazione, may I say that some time ago I carried out a series of experiments with pollen? My object in doing so was to ascertain if bees that have reached the imago stage are physically injured by being debarred from same. The result of these experiments led me to the conclusion that there are circumstances when bees are much better without pollen, and to give it them at such times causes physical suffering. And I ask myself the question, Does a virgin hatched in a nursery need pollen in her candy? The first experiment proved that artifical pollen (pea-flour) in candy made on the "Good" plan, *i.e.*, honey thickened with castor-sugar, caused the virgin and her few attendants to be badly affected with dysentery; while that made with fine oatmeal was not so bad in its effects. But cages supplied partly with pollen candy and partly with plain gave still better results, and those cages with plain "Good's" without any pollen at all, gave the best results. The query then arises, Are there not sufficient pollen-grains in honey alone to supply the needs of the adult bees.

My next experiment was in wintering stocks; and in this direction I found that driven bees placed on combs partly filled with honey, supplemented with plain candy, came out best; those placed on combs of honey with pea-flour candy to make up the shortage wintered the worse, those with oatmeal candy coming out midway between the two. I have also wintered stocks short of stores with pollen

candy, and each time they suffered with dysentery, while those with plain candy wintered well.

The results of this series of experiments have led me to the following conclusions:—1. Bees in confinement should not be pollen-fed. 2. During the time that bees are required to be kept perfectly quiet and very rarely take flight they need no pollen at all, and if fed on it will suffer in being unable to discharge the faces, while if cleansing flights are not possible they will suffer in consequence. 3. That great care is required if pollen is given in early spring to cause brood-rearing, or the loss in unnecessary flight will counter-balance the gain in brood.—"British Bee Journal."

The Aphis or Green Fly.

The great family of the true aphides belong to the Homoptera. This name is given because their wings, both back and front, when present, are alike, literally 'same-winged.' They belong to the division known to entomologists as Dimera, this signifying that the tarsus has only two joints. Another feature by which the aphis may be distinquished is that the antennæ or horns are long and slender. There is scarcely a plant that grows, either in wild or cultivated state, but has its own infestation of aphis, many kinds of plant having aphis peculiar to themselves alone. These parasites are to be found with and without wings. There have been many theories advanced as to the reasons for this phenomenon. Probably, the true one is to be found in the theory that the wings are produced in order that at certain times the insects may migrate to lay their eggs on other plants or trees.

During the early spring months the eggs that were laid on the trees or plants in autumn and that have survived the winter hatch out, and for a time the insects so produced have the power of laying eggs. This is probably a provision of Nature whereby the danger of extinction of the insect by sudden intense frosts is obviated. In any case, later on the insects are propagated by a system called "budding," the aphis being then viviparous. This goes on until the autumn, when eggs are again laid. The resultant aphis which survive the winter begin their work of reproduction so soon as the weather conditions are favourable to the production of the necessary food. There seem to be few, if any, males present during the summer months, but as soon as autumn conditions prevail the males again make their appearance, and egg-laying commences. In the year 1743 Charles Bonnet made some careful observations and experiments, and found that a single female produced 90 young lice, the 90 produced 8,100, and these in the third generation gave 729,000 lice. These produce 65,610,000, and the fifth generation of 590,490,000 will, barring accidents, produce 53,142,100,000, at the seventh a very little arithmetic will suffice to show 4,782,789,000,000, and, carrying this compound work on to the eighth generation, from one single aphis will have been produced the astounding total of 441,461,000,000,000. There are often eleven or more generations in a year, and when it is remembered that in a single plum orchard the season may be started with a few million individual aphis, the rapid destruction that ensues will not be wondered at.

Where should we be if Nature did not strike a balance? Our readers will see that, if only one egg escapes the soda potash spray, there will soon be aphis to take up the running. What, then, is the state of those trees that have been left to the chance that Nature will bring her own remedy? As soon as the insects are hatched they begin to live on the juices of the plants or trees on which they are hatched or born. This thy do by inserting their suckers or trunks into the plant tissues, either of leaf or tender shoot, and the grower who sees the aphis in their billions on his trees or plants knows with certainty that every single one of them

represents so much of the life-blood of his trees or plants that ought to have gone to produce wood, leaf or fruit. The extremity of these insects are two small honey tubes. These are connected with a small gland that produces a sweet fluid. This is continually oozing out, and produces the honey-dew on plants, in which the soot fungus (*Capnodium salicinum*, Mont.) delights to grow, making the leaves of the tree appear as if soot had been distributed over them. The ant is supposed to eat the aphis, but this is a mistake. The presence of the ants indicates to the watchful man the presence also of the aphis or scale insect. The ant, by a process of milking, causes the aphis to exude more honey, which the ant takes for its own food and that of its young. Ants will also carry the aphis to pastures new, just as a farmer takes his cows to a new meadow.

The remedies for this insect from the early summer onwards in the season are quassia and soft soap, soft soap alone, soft soap and sulphide of potassium, paraffin emulsion, naphthaline, paraffin and soft soap fluid, and for some varieties sprayings with Paris green or arsenite of soda. We believe the follow- formula, given as a coarse spray through the largest spraying nozzle, will be found effectual in most cases :

Potassium sulphide 1 lb., soft soap 7 lb. (the best), soft water 50 gallons. This has the merit of being a fungicide as well as an insecticide. The soap should be dissolved in hot water, also the sulphide, and be made up to 50 gallons with water at 90 deg. The mixture should be applied while hot, and must be used as soon as made."

INTRODUCING QUEENS.

BY W. REID, SEN.

Like queen-raising there are so many ways that to show them all would tire your readers. A friend wrote me the other day saying : "I am sorry to state that I lost queen when introducing her ; I took every care ; placed brood only with her ; she left the hive, and was lost." Another wrote similarly, only the ants took possession and killed the queen. If this plan is practised by placing queens on hatching brood only the hive should be placed in a warm room for four days and made bee-proof. I do not recommend it. The best method I know to introduce a queen is : Obtain, say, the lid of an axle grease tin, cut a piece out of top, place over this hole a piece of safe wire inside, see there is no sharp spikes to hurt queen, take a frame with some empty worker cells, a few cells of honey, clear bees off, and place queen on frame. Now place cage made from axle grease tin over the new queen, turn cage to right or left, and it will cut into the comb, say, the eighth of an inch or a little more. Now bring a piece of twine round under bottom bar of frame, then over top bar and over centre of cage. Caution : See that the comb is level, or bees may creep under the cage and sting the queen. The string is to keep the cage from sagging. Bees often cluster on the cage and cause the cage to tilt. Place frame containing introducing cage in centre of hive, and allow space so that the bees can pass between opposite frame and cage. It will be found necessary to store one frame during the introduction —say an outside frame containing honey also. Some beemen keep the other queen until the new one is introduced. If so the old queen can be placed on this frame, but when burning frame kill old queen a day or two before returning that frame of bees. — "Mudgee Paper."

How to Release Queen from Cage.

Of course the old queen is removed before the new one is placed in the hive, but only just before the new one has been in the hive 24 hours or thereabouts. We open the hive, in the majority of cases, to find the new queen has an egg in each cell and the bees spread evenly

over the cage. Lift the frame out containing the caged queen, take a lead pencil or a pen-handle, and at opposite side in centre of cage pierce a hole large enough to allow the queen to walk out. Do not make the hole too large. Place the frame in the hive as before, but see the hole in comb is far enough away to allow the queen to pass out. Bees will enter in this hole. Sometimes the cage will be filled with bees in a day or two. Look in again, and if the queen is not out make the hole larger, but do not try to let the queen out any other way. When first opening the hive to let the queen out, if the bees are producing a hissing sound and trying to sting the queen, it is better to leave making the escape hole until next day, but it is rarely necessary to do this. This cage is my own invention, and I never knew of a failure. Anyone becoming acquainted with the cage would not be afraid to chance a 10-guinea queen in it.

Simple Talks on Bees.

The Head.

The head of the bee is her brain-box, and a carrier, besides, of many other wounderful implements. If the size of the brain be a reliable gauge of intelligence, the worker bee, whose brain, according to Cheshire, is 1-174th of her body, has been richly endowed. She has three simple eyes and two compound eyes which, in the worker, contain about 12,000 hexagonal lenses. Her antennæ are organs of touch, guiding her in the various operations carried on in the darkness of the hive, as well as out of doors, and enabling her to hold communication with the other bees of the colony. Her jaws are very powerful; with these she bites and carves the wax when comb-building, or cuts the tapes which have fastened combs in her hive, when left too long by a careless owner, or opens holes in the sheet upon the frames, and shows herself where she ought not to be. Her tongue gathers nectar from the flowers, and at its end, the spoon can collect the smallest quantities, so that, as Cheshire says, "she can sip a stream of nectar so fine that 600 miles of it will, when exaporated, store but a 1lb. section box."

The worker's tongue is longer than the queen's tongue, and the drone's tongue is shorter than the queen's The The male bee, not by nature fitted to gather nectar, would starve in a field of white clover, his tongue-length being insufficient to reach the secreted nectar. Among the honey-cells, however, he can get in good work, and, as he is a heavy feeder, beekeepers take pains to prevent excessive production of drones and to secure worker brood instead.

Even the worker's tongue is too short to reach the nectar secreted by some flowers. Red clover, for example, the native worker often finds it impossible to gather from. Hence efforts have been made to introduce Italian bees with a a longer tongue-reach. Root's famous "200 dol. Italian queen," now, alas! deceased, and for which root says that he would now give 500 dols. if he might have her back, created no little excitement in America when it was announced that her progeny could work on flowers which were beyond the powers of other bees. Them began the measuring of tonges, and queens with 1-100th inch extra tongue-reach were advertised as "the red clover hustlers, too good for sale." This enthusiasm, however, like the valued queen, appears to have suffered extinction.—J.G.D. in "Irish Bee Journal."

The term "skep" is derived from the same root as the word "sky." The skep was originally a bashet of wickerwork daubed with clay, and when straw was used in lieu of wickerwork the original name was retained.—"British Bee Journal."

Dr. C. C. Miller, in two apiaries in a single season, produced 20,000 sections of honey.