The Australian bee bulletin. Vol. 17, no. 1 April 30, 1908

West Maitland, N.S.W.: E. Tipper, April 30, 1908

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THE AUSTRALIAN Bee Bulletin.

A MONTHLY JOURNAL, DEVOTED TO BEE-KEEPING.
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ted 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.

Editor & Publisher: E. TIPPER, West Maitland, N.S.W. Aus.

MAITLAND, N.S.W.—APR. 30, 1908.

WITH this issue commences the 17th volume of the "Bee Bulletin." Its first issue is April, 1892. We thank our many friends for their continued support and patronage. Our policy has been the interest of producers. We are not supply dealers. There are many who think it their duty to increase the number of bee-keepers, no matter what the likelihood of success may be. How many, under such conditions, have given up bee-keeping as a non-paying industry. What disappointment have they had to endure. The uncertainty of crops, the planting of wheat to take the place of the natural timber. Then there are the people who sell their crops for anything they can get. We lately saw a vile instance of such. A bee keeper had sold his crop for what the storekeeper chose to give him. Shortly after, calling in another store, he found he could have got a better price, wanted to countermand before delivery, but the storekeeper had a quiet laugh at him. In another instance the storekeeper told us he had the best honey he had ever come across for 9s a 60lb. tin. We had just sold it at a much higher price. Who was to blame? The bee-keeper who sold, or the storekeeper? That beekeeper does not take a bee journal, and deserves to get a low price. But how many suffers through his carelessness! The Brisbane newspapers, the Maitland, the Melbourne, and Sydney give prices. And it is the duty of beekeepers to their fellow men to see

those quotations are correct and not sell their honey below its proper value Every beekeeper has a right to do his duty to his fellow beekeeper. Another instance ! Say there is a storekeeper in a town ; Do the two or three storekeepers tell all the world what their incomes are to get more to compete with them. No fear. But what do beekeepers do ? We often hear so and so has got so many tins of honey. Statements which we have often doubted. Oh yes, beekeeping pays. Does it ? Reckon up what it pays in time and material, same as any other business does. Then ask if it pays ? We wind up by again thanking our many friends for their past kindness and ask for a further continuance of their favors.

Winter Feeding.

To those who have taken too much honey, or at any rate not left enough for winter feeding, this is a most important time. One contemporary recommends feeding sugar syrup instead of honey, and says it is cheaper.

For different reasons we were not able to go as often as we would like to see our out apiary after the last flow this season, so left in the hives more than was really necessary, and are not afraid of starvation in consequence. In this we are not afraid of the disease that is said to follow starving bees, and also remember a remark made by the great foul brood man, M'Evoy, that in the majority of cases where he was sent for to inspect foul brood apiaries, the majority of them were *starved brood.* Also that was often called foul brood was cured immediately a honey flow commenced.

Mr. R. Beuhne, of Tooborac, Victoria, having patented an uncapping machine, which is spoken well of, is proceeding to America and Europe to get it introduced there. The Victorian Government is providing him with £50 towards the expenses of his trip

We acknowledge from the New Zealand Department of Agriculture Bulletin No. 3, headed "Bee Culture." 1. Practical advice ; 2, apiculture in relation to agriculture by Mr. Isaac Hopkins. It is as Mr. Hopkins' writings usually are full of good and up-to-date information.

Also, "Queen Land," a publication by S. Simmons, at Heithfield, Sussex, England. Mr. Simmons has had 40 years' experience with bees, and the publication should be well worth getting.

BEES A NUISANCE.

Mr. E F. Hunter, Trunkey, writes us as follows :—

I am interested in 200 colonies of bees, situated one mile and a half from Trunkey close to the main Tuena Trunkey road, to be exact, the nearest colony is 1½ chains from the road. Close to this road, on the opposite side, is an old gardener, who is complaining that my bees are annoying him, and is going around with a petition to the Minister for Lands, praying that I be compelled to shift my bees. He has got about 20 names on the petition, 15 of whom do not live within 1½ miles of the bee yard, and who never or rarely pass it. Do you think I should have any fear of being removed, or should I get up a counter petition. I could get all prominent men of this village to sign it. The business people, who are running their carts right past my yard, find no annoyance from bees, and would willingly give me a statement to that effect, also other bee men with colonies aggregating 500 or 600, would sign the petition. The man who is carrying around this petition I had in my employ at one time. My yard is on a camping and water reserve, held under a permit, "permissive occupancy," from Minister of Lands. I have built a house, fenced and otherwise improved the two acres, and it would be a severe blow to me to have to shift. What has become of the Bee Farmers' Association ? There are four or five men in this

locality who would join it. I should like to have your reply to foregoing.

[REPLY.]

Wallabadah,
April 15, 1907.

Mr. Hunter.

Dear Sir,—I don't think you need be at all alarmed about that old man. Get up another counter petition, and if he beats it, I'll get up another with all the signatures I can get. I don't think he has a chance of succeeding, no Minister who knows anything about beekeeping would listen to him. Think of the number of beekeepers in all parts of the world, and such a request to a Minister has never been made during my 16 years with the A.B. Bulletin, and I don't think any Minister would accede to it. One and a half chains is quite sufficient protection, besides the good it is doing to his garden. If there should be trouble put up a fence on the outside of the bees, so they will fly over. Write me again.—Yours sincerely, E. Tipper.

CORRESPONDENCE.

H. Bros., Awahuri, N.Z.—The past season has been a very fair one, with a nice, early spring. We had quite a good honey flow in November and December, but as the rains we usually have about Xmas and New Year were very light, the dry weather soon cut off the clover, on which we mainly depend, and the bees did not gather much after the second week in the new year. Trusting the Australian beekeepers have done well during the past season.

W. & S. W., Lower Bucca.—We are sending you photo of our apiary. We only started bees last October, but so far have done very well. Our largest flow from one hive, pure Italian, one of Jones' queens, we netted 120lbs., and from 16 hives the flow was 22 cwt.; a month ago since we robbed.

W. S. P., Gunnedah.—Yes, Mr. J. F. B., I have a few good things amongst the bees since I came to Gunnedah, which I could not keep to myself, no matter how devoutly I may have wished to do so, notably drought and paralysis, which completely wiped off my bees on two occasions. The same troubles affected brother beekeepers in this district, one person who had over 300 colonies was reduced to less than a dozen. The same person told me that in the good old days of long ago, of which your Dungowan correspondent writes, the bees would build under the stands, which were usually raised 3ft. or so above ground. Many a time he has placed a wash tub under, and sliced off the beautiful white combs ints the tub with a spade. But times have changed, and thousands of acres of what was then primeval bush has been ringbarked, and where once thick scrubs abounded wheat fields have taken their place. The bees have done well this season; swarming was very bad during February and March. They used up most of their pollen, and none is coming in now, so the bees are gathering a sort of mill dew from pumpkin leaves as a substitute. Over 25 inches of rain has fallen since Nov. 3rd. We do not usually expect more than this for 12 months, so the next season should be good.

B. F., Frampton.—I may state this has been a very poor season for the bees here, the drought of course being responsible. However, bee forage is very scarce in these parts, the insane policy of ringbarking having been carried out to extremes, as it has been in most parts of the states.

Mr. B. Shaw, Parkes, writes:—R. Bee matters, things have been pretty busy here this last two months, and a prospect of the flow continuing another month; this is the best we have had here this season. Hope you will have success with your honey and beeswax, though as you say it is an uncertain business.

From J. G., Gunnary.—Sir,—Will you kindly let me know by return post if the New South Wales Beekeepers' Association is still alive, and who is the Sec, and when and where is their next meeting, as I would like to attend. Trusting you will oblige. Thanking you in anticipation.

[In reply I can only state such association has not been alive for several years. If an association is wanted it is one of producers, not parasytes, as too many of these associations are. See outcoming A. B. B., speech by President of New York Association.]

COMMONWEALTH BOUNTIES ACT.

The "Bounties Act, 1907," which is now in force, provides for the total payment of £339,000 (spread over a term of years) as bounty for the production in Australia of the articles named below. We also give the period, dating from 1st July, 1907, during or in respect of which bounty may be paid; maximum amounts which may be paid in any one year; and minimum quantity which must be produced between the 1st of July in any one year and the 30th June in the next succeeding year.

Cotton, Ginned, 8 years, £6,000, 250 pounds.

N.Z. Flax, 10 years, £3,000, 5 tons.

Flax and Hemp, 5 years, £8,000, 5 cwt.

Jute, 5 years, £9,000, 10 cwt.

Sisal Hemp, 10 years, £3,000, 1 ton

Cotton Seed, 8 years, £1,000, 5 cwt.

Linseed (Flax Seed), 5 years, £5,000, 5 cwt.

Rice (uncleaned), 5 years, £1,000, 1 ton.

Rubber, 15 years, £2,000, 2 cwt.

Coffee, raw, as prescribed, 8 years, £1500, 250lbs. of coffee beans.

Tobacco leaf for the manufacture of cigars, high grade, of a quality to be prescribed, 5 years, £4,000, 5 cwt.

Fish, preserved as prescribed, 5 years, £10,000, 5 tons

Dates, dried, 15 years, £1,000, 10 cwt.

Fruits, dried, except currants and raisins, or candied, and exported, 5 years, £6,000, 5 cwt.

Combed wool or tops, exported, 3 years, £10,000, 1 ton.

An imperative requirement of the Act is that white labour only shall be employed in the production of goods upon which bounty is to be claimed. The wages paid in the production of the bountiable articles must be the standard wages payable in the place or district.

What Sweet Clover does with poor Land.

The following clinching argument in favor of sweet clover as a soil-renovator appeared in the *Oklahoma Farm Journal.* It completely knocks the bottom out of the assertion that sweet clover is a weed, and proves it is the greatest soil-improver we have in this country to-day.

I cannot understand why sweet clover should be more detrimental to orchards in Oklahoma than in Kansas. I would have to be shown to believe it. A few years after I came to Kansas I planted an orchard on the poorest kind of Kansas gumbo land, not fit for cultivation. I mulched young trees heavily for three or four years, also sowed it to white sweet clover, partly because lands would yield no returns for cultivating, and partly because an orchard should not be cropped with any thing not a legume, and mainly for bees to work on clover. The orchard grew finely, and produced the finest of fruit on coming into bearing. The sweet clover mastered everything and grew immensely. It had full possession eight or ten years, when I sold out eight years ago. Last fall I was there. About half the orchard had been in peach-trees mostly, and the new-comer had cleared up half the orchard where peaches had grown, and was growing great crops of corn on that old gumbo land, beating his best bottom land, he said. I was amazed at the sight. He asked me what caused such corn to grow

on that land. He said the plow would go right down to the beam in that soil—and he never had manured it. I knew in a moment it was the sweet clover. And there you are. The apple-trees remaining were extra large, and growing magnificent fruit.

I am 73, and too old to plant another orchard. If I had known what I know now, what sweet clover would do to gumbo land, I could have bought 1000 acres of such land at seven or eight dollars per acre, and made it worth seventy-five dollars per acre for growing corn and alfalfa.

Knowledge came too late in my case, but I know nobody will believe such a story without the experience. It is true all the same. And you need not doubt it would do the same trick in Oklahoma or elsewhere. I am not writing for publication. It is nothing to me. I know what my eyes have seen. I only regret that I did not know it sooner. I have a warm feeling for you and your paper, which is doing good work.—"Gleanings."

Stingless Bees All Dead.

One of the most fascinating experiments ever attempted in apiculture, according to Discovery, was begun last summer at the American Museum of Natural History, New York City, and ended as was expected, in failure through the death of the insects.

The subjects of the experiments were a colony of brown stingless bees—probably the first ever seen in New York.

They were brought from the interior of Venezuela. In the insect gallery visitors could see them busily at work in a glass-covered box, in which they had built the querest nest imaginable. Rising to a peak, it resembled nothing so much as an irregular, jagged mountain, of a very dark chocolate color.

The box was placed at a sunny window, in the lower frame of which small apertures connected with the box afforded egress and ingress to and from the outside world. The little foreigners when installed immediately set about making themselves familiar with the city and its parks and the surrounding country.

Hard by, at another window, was a colony of American honey-bees, stingers these. The visitors were brought to the United States with the idea that they might be crossed with the honey-bees and a new stingless species thus produced combining this advantage with the superior qualities of the native insect.

The species were so remotely related and the habits of the stingless variety so highly specialized, however, that the scientist at the museum considered hybridization to be an impossibility.

The honey of the stingless bee, although much appreciated in Cuba and South America, where it is supposed to possess valuable medicinal properties and is an article of food, is very inferior both in quality and quantity to that of the honey bee. As pollen gatherers, however, they are vastly superior to the latter, being able to carry much heavier loads and to work longer and in weather when the honey-bee would not venture out. In this capacity they would have been important allies of the agriculturist in the cross-pollination of flowers and in increasing the fruit supply.—"American Bee Journal."

Feeding Bees in Winter.

The wise bee-keeper will seldom have occasion to feed bees in winter; if very wise, never. For he will take care in advance that there shall be not only a plenty but an abundance of food in the hives to last through the winter, and also through the spring as well. The inexperienced, however, is likely to be caught with some colonies having so little winter provision that he fears starvation. However bad feeding in winter may be, death from starvation is worse. So if danger of starvation is feared, better feed at once. Especially toward spring will these occasions arise.

PRICES OF HONEY.

Melbourne Australasian.—Honey.—The market is firm; up to 3d. is obtainable for prime, and for medium to good sellers are accepting down to 2¼d. Beeswax—Prime clear samples are quoted up to 1s. 2d., uneven quality and color being on offer at from 1s. upwards.

Melbourne Leader.—Honey and Beeswax: Honey is in fair demand at 2¾d. for prime, and up to 3d for choice quality. Inferior, cloudy, and dark is quiet at down to 2d. Beeswax is quoted at 1s. 2d. to 1s. 2½d.

S. M. Herald.—Choice brands of honey still continued to move well, while second qualities remained slow. Wax was still firm. Honey: 60lb. tins extra choice extracted /3, prime /2½, good /2¼, inferior and candied /2 Beeswax: Bright, 1/2 to 1/3; dark, 1/2.

HONEY.—

The market continues dull, and there is no change to report in prices. Choice Western, 2¾d. to 3d., and medium qrality from 2d. to 2½d.

BEESWAX.—

The demand slow. Dark lots, 1/1½; Choice, 1/2 to 1/2½ per lb.

Stealing Bee Boxes.

Harold Stuve was charged with the larceny of one bee box and frames, valued at 12s 6d, the property of A. E. U. Alley.

Mr. O'Halloran appeared for accused.

Constable Sinclair deposed: At about 2 p.m. on Monday, 30th inst., I went in company with constable Smith to the house where defendant lives. I made a search of the house and found the property (produced) which Alfred Alley claimed as his property.

Alfred Ernest Underwood Alley, laborer, residing in Raglan-street, deposed: Defendant lives about 100 yards from me. I made an inspection of my bee hives on March 20; I missed them on the 28th; Afterwards with the police I found them at defendant's place; I did not give anyone authority to dispose of them; I value the property at 12s 6d.

To Mr. O'Halloran: I have known defendant for 6 or 7 years, and know nothing bad about him; I will swear defendant was not with my brother on the night of March 13, I cannot say what day of the week the 13th March fell on; I will not swear they were not together on the 12th March; they were together on Saturday night week; my brother is about 17 years of age; he helps me with my bees at times; I can't say I saw my brother on March 13.

Roland Alley, living with his brother, deposed: I saw the defendant at noon on March 13; he asked me how to make bee boxes; I drew out a sketch of a box; he said he was going to make two boxes like my brothers; I never gave the boxes (produced) to defendant.

To Mr. O'Halloran: I will swear I never gave anything to defendant; I did not come home with defendant on Friday night, March 13.

Harold Stuve, defendant, deposed: I am 18 years of age, and was never in a Court before; I did not steal the goods complained of; Rol. Alley gave them to me on Friday evening, March 13, between 6 and 7 o'clock; I met Roley Alley on March 12, and asked him what he would take for a box and slides, and he said he would give me one; I met him the next evening at Robertson's; we walked up the middle of the street, between his place and Maddens; I said "I want to get home;" he said, "wait awhile, I'll give you the box;" he jumped over the gate and handed me the goods produced; I saw Harper when I got nearly home; I have had the goods hanging up in my shed; I painted them about three days after I got them; I have been chums with Roley Alley for years; we never had any falling out.

To the Bench: I don't which of the two owns the boxes; I think they both have something to do with them.

The case was adjourned till 2 p.m.

James Harper also gave evidence.

Accused was found guilty, and was fined £2, with costs of court 8s.

About Robbers and Robbing.

A Seasonable Article.

There is nothing that will give the engineer, or anyone else engaged in beekeeping more trouble in less time than a bad case of robbing. Where only a few hives of bees are kept there is seldom any danger, unless there be a larger apiary within half a mile or so, but it is well for the beginner to know how to recognise it, when to expect it, and how to deal with it. In the first place, it is comparatively easy to prevent an outbreak of robbing when one knows the habits and inclinations of bees fairly well; and in the second place, it is pretty hard to cure a bad case so it will stay cured.

When the honey flows from clover and basswood come to an end, all the bees which were working so hard at carrying home the nectar are suddenly thrown out of employment, and immediately commence looking about for something to do —for some new source from which to gather nectar, or honey, or anything sweet. An observant person, who knows what he observes, can detect this state of affairs as soon as he approaches his apiary. Whereas, at the height of the honey-flow, the bees were going in and out of the hive in large numbers, wasting no time in standing about, but attending strictly to business, when the flow slackens fewer bees will be seen at work, and there will be more of a tendency to loaf around on the alighting board and the front of the hive. When the hive is opened it will be seen that there are many more bees at home than when the flow was good, and they will probably be not so good humored and show more inclination to sting. When the honey-flow stops completely, as it does in many localities in early August, (Feb. or March in Australia.—Ed.), the above symptoms are more pronounced. Very few bees will be at work in the fields, though the hives will be overflowing with them. Though there is nothing to be had from the flowers, there are always a certain number of bees on the wing, looking for the nectar which is no more to be found where they have been gathering it. The bees will be observed nosing round the hives, looking for a chance to get in and secure a load of honey which they can smell and know is there. They poke all around their neighbours' hives, and fly down close to the entrances, jumping quickly away when the bees on guard on the alighting board try to catch them. Not a great many bees will be seen at this work, but just one here and there. If every hive is well populated, there will be no trouble, for a robber-bee cannot steal honey from a comb protected by the bees that own it—that is, a lone robber cannot, and the would-be robbers travel alone at this stage of the game. But let any honey be left where these prowling bees can get a taste, whether it be in a hive having so few bees that they cannot properly protect their combs, or in a comb left standing outside a hive while the bee-keeper is working at the colony, or in super combs from which the honey has been extracted and just the drippings remain, and the trouble begins. The first prowling bee to find the unprotected honey takes a load and carries it home. The effect is wonderful. It is like a prospector coming into a mining camp with a sackful of gold. Immediately there is a rush for outdoors, and the bees which a few minutes before were resting quietly in their hives are rushing through the air in search for the source of the new flow of honey. They soon find it and clean it up. By this time the "get-rich-quick" fever is in full possession, and the bees are transformed from decent, stay-at-home citizens into perfect fiends. It is no longer a case of a few prowlers, but of a thousand bees, ready to pounce upon anything that promises honey, though a free fight be necessary to get possession. Anything sweet has the same effect as honey, and the bees will crowd into a kitchen where fruit is being preserved, unless prevented by means of screens, or pile on to fruit-pulp thrown out after jelly has been made from it, or try to chew a hole through a board, or between two boards where there is a narrow crack, to get into the extracting house.

The only thing to do when things get to such a state is to shut everything down tight. Any small colonies must have their entrances made so small that they can defend themselves. Houses and every place where honey is kept must be made absolutely bee-tight, and kept that way. If a small colony is being robbed, it may sometimes be saved by being closed up completely, robbers and all, and set in a cellar or some such

place for a couple of days, and then taken out and placed on a new stand. Or if one can find which hive is doing the robbing (often one or two hives in a yard will be responsible for most of the trouble), the robbed hive and the robbing hive may be transposed. This so confuses the robbers that they are completely bewildered, and give the whole business up. But the best cure is prevention. Watch for the slackening of the honey-flow, and keep all honey out of reach of the prowlers, or "snoopers," as I have heard them called. Small colonies and nuclei should have their entrances contracted to a safe size before a robber tries to get in. Kitchen doors and windows should be screened, and nothing containing sugar thrown out where the bees can get it. And keep the honey-house bee-tight, or you may find your pets indulging in a Cobalt rush some fine day. If necessary to open a hive, do the work as quickly as possible, and don't leave a comb out of the hive longer than is absolutely necessary. If many robbers come buzzing about the open top of the hive, and fighting begins—you will know when that time comes—whether you ever saw it before or not—close up the hive and wait until things quiet down, unless you have a bee-tent to set over yourself and the hive while working. A tent is a nuisance to work in, but is sometimes a necessity, and every apiary needs one.—E. G. Hand, in the "Canadian Bee Journal."

The Functions of Air Vessels.

The popular idea of the use of atmospheric air by animals is perhaps too limited. The use of the air is not alone the oxygenation of blood, although this is undoubtedly its main purpose; but another highly important use is its lowering of the specific gravity of the body when inspired, or raising the specific gravity when expelled. Fishes seem to have air-vessels for these uses alone, the oxygenation of blood being by osmosis in the gills. Other animals when swimming show by the small portion of the body exposed how nearly their specific gravity is unity (or that of water), and if the lungs become charged with water instead of air the slightly greater specific gravity of the body causes it to sink.

It is a matter of common observation that dead bees are smaller than living ones, the reservoir of air afforded by their great vessels being emptied. Mr. Cowan, in explaining the flight of the bee, shows how the charging of these chambers with air by muscular effort lessens the comparative weight of the body, and thereby assists the insect's flight, and flight is prepared for by such charging. Further, the drone is incapable of performing his special functions without the aid of charged tracheæ, and, just possibly, the queen also. Now all these functions are performed with high muscular exertion, involving more rapid oxygenation of blood, which is specially provided for just when it is required. So it is with defence of its home; the flight then seems more instantaneous than ever—anger arouses the bee In other words, the bee is more alive at such times than ever.

If the bee be numbed it cannot fly; its vitality is low. Then there are certain diseases which seem almost uniformly to be accompanied by two symptoms—abdominal distension and overburdened intestinal canal, and impaired or destroyed power of flight. In bee-paralysis the abdomen is much swollen, and, running about, the bees fall to the ground. In May pest the "abdomen is slightly inflated," and the bees unable to fly, drop to the ground; they climb the grass to make an attempt at flight, but fail In this case Mr. Cowan, in the "Guide Book," shows that threads of mycelium encircle the tracheæ, 'in some cases so thickly as to prevent the circulation of air for the distension of the air-sacs." In dysentery there is often great distension, but this, as in other cases, is not

the same as the dilatation of the air-vessels; it probably arises from the generation of gases in the alimentary canal, as well as accumulation of fæces. Thus arises involuntary discharge inside the hive, much as in the cases of diarrhœa and dysentery in the human subject The healthy bee can take its flight and perform its functions naturally, and as they fly away and leave traces of their cleansing-*flight*, the beekeeper, as pointed out very recently in the "B.B.J.," is under no apprehension as to their well doing. The poor dysenteric bee has little power of flight, its very distension, as well as ill-health, preventing the charging of the air-vessels Physical occlusion of the spiracles by a coating of oil or other substance would in all these cases have the same effect, so far as the power of flight is concerned.

Full vitality was spoken of just now. In the human subject its diminution generally denotes ill-health. But bees are otherwise constituted, so that in the long winter lowered vitality simply means semi-torpidity; and, indeed, our own functions are partially suspended in rest and sleep, though for a briefer period. Bees may be as perfectly well in their long rest as we are in sleep. Give them the stimulus of heat or disturbance, and fresh air will do the rest to rouse them to activity. This is, then, no necessary connection between winter confinement and dysentery, and good food and sanitary hives ought to carry the bees through the winter without any disease such as dysentery is The long wait for days of flight is in Nature accompanied by diminished consumption of food, and in a healthy bee this will cause no inconvenient or excessive intestinal accumulation. When activity is again aroused the bee will enter into and enjoy life again.

That life and its morbid affections we shall better understand if we realise the great functions of the air-reservoirs and their mutual independence: (1.) The supply of the circulating fluid with oxygen; (2) the lowering or raising of the specific gravity of the body; (3) the provision of pneumatic machinery, with an elaborate system of valves, for the nerves and muscles to control and utilise; and (4) the balancing and protection of various organs in the exercise of their functions by means of an elaborate series of air-cushions, much as the heart, liver, and stomach directly, and intestines, &c., indirectly, are by the lungs in our own bodies.—S. Jordan, First-class Expert, B.B.K.A., Bristol, Feb. 17.—"British Bee Journal."

Fermentation and Digestion.

C. W. Dayton.

If we extract a quantity of honey before the bees have been allowed sufficient time to put their sealing of wax upon it, and we store such honey in an open vessel, in a short time, thereafter, we will find that the thinner part has risen to the top, while the thickest and ripest has taken its position at the bottom. The cause of this separation is that water is lighter in weight than ripened heney. Water weighs eight pounds to the gallon, while honey weighs twelve. This great difference makes the separation a rapid process. If we remove this most watery portion, water, in greater or less amounts, will continue to rise for considerable time. In an open-top receptacle we can observe this process going on. It is the same operation which is being carried out in each cell of honey in the combs. The watery portion of the nectar is constantly rising to the upper and outer part of the cells where the bees may remove it.

I have been led to believe that they restore this watery portion in the shallower cells nearer the edges of the combs in which position it is easier to evaporate the surplus water from it, and this method is continued until the water ceases to appear on the surface of the most completed cells.

The cells of the combs have an upward inclination as if to prevent the honey from spilling out. When the nectar which is being brought in from the flowers is thin, the slant of the cells which are being constructed at that time is greater than when the nectar brought in is thick and ripe. Besides this shaping of the cells to retain the honey there is also another force which we call capillary attraction, which draws the honey toward the central midrib of the combs. Still there is yet another force or principle which assists to hold the honey in its place, known as affinity, or the life of the honey. If it were not for the affinity of the honey, it would never granulate. Granulation is honey's plan for self-protection or preservation. Every substance which is not entirely inert has a method for the preservation of life. Apples or potatoes have their skins to protect them from the elements—temperature and moisture. Some may be disposed to call it cohesion. It seems exceedingly handy to regard it as the life of a living substance.

As often as the temperature of granulated honey is changed, there is a part which becomes a permanent liquid. This liquid can easily be drained out from the more solid mass. The liguid is somewhat darker than the granulated portion. It is the part which has been consumed in protecting the main bulk from the destruction that a change of temperature causes. A share of it must be sacrificed that the main bulk may remain unchanged, or, as perfect as it was originally. So long as honey of any kind becomes colder, or, more contracted and afterwards expands, this waste occurs as surely as a cluster of bees or a number of persons in moving about require sustenance to support their activity; and it requires sustenance to support the activity of the integral particles of honey. That is the reason the darker liquid can be drained out. It is darker because it has been burned up as really as if consumed by fire. The refuse substance which our breath casts adrift in the air was once food from which the valuable part has been extracted.

This active force which temperature and moisture set up is known as fermentation. Fermentation is at work in all parts of a receptacle of honey. That part which contains the most water, or hydrogen, is at work most because fermentation works by the assistance of water. When the water is most plentful at the top that is where the most fermentative action is going on—the most consumption—the most fire, and the most refuse results, consequently the uppermost part of the honey becomes the darkest colored and most deficient in flavor and nutrient.

The natural fermentation of honey is able to proceed without atmospheric aid, but that ferment which operates in an uncovered jar of fruit is a different kind and requires atmospheric assistance. While no man knows what fermentative force is, yet we can watch and study its working and results quite easily. If the honey is entirely ripe when it is removed from the hives, instead of water accumulating at the top, there will be on its surface a thick, albuminous film, which admits of the gradual escape of the carbonic acid gas and also protects the honey from the condensation of moisture and the setting up of acetic fermentation on its surface, which would destroy any tendency toward the formation of the protective film. That part of the fermentation next to the honey is vinous or natural and the part next to the atmosphere is acetic. One is destructive to our organs of digestion and the other is beneficial. The natural ferment in honey is disposed through the whole bulk, bottom as well as top and needs only the introduction of moisture to increase its activity. No matter how thick the metal of a receptable may be moisture will find its way through th'

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metal in an amount which corresponds to the rise and fall of temperature. This change of temperature causes fermentation and the fermentation is what prolongs the life or quality of the honey by the comsumption of a part of it. After fermentation the carbonic acid gas escapes into the air and the solid part remains in the honey causing it to become dark in color. In a time sufficiently long fermentation would use up the entire bulk of honey which would be carried away in the shape of carbonic acid gas.

Now in the eating of honey this principle of activity is transferred to our systems and we become able to move. The purpose of fermentation is to split up the particles of food so as to render them small enough to be absorbed through the membranous walls of the digestive tract into the blood. This bottom ferment in honey is nearly, if not exactly, the same as the healthy digestive ferment, which, probably, is analogous to the refined part of yeast ferment. The healthy ferment of the stomach is a bottom ferment. When food in the stomach fails of digestion, it produces acetic fermentation, which works at the top of the food. When ripe honey is kept a long time, it becomes darkened all the way through, showing that the refuse from the fermentation maintains its position alongside of the honey with which it was produced. If the honey were unripe, the bottom part of the honey maintains its light color, while the fermented portion is considerably separated and rises and floats on the top in a very much darkened condition. This indicates that the ferment in unripe honey is acetic. Bees will carry away honey which ferments from the bottom, eagerly, but that which has contained acetic fermentation they are very slow to appropriate.

If we place on our skin a substance in which acetic fermentation is at work it will turn the skin red and then white with eventually a sore and decay, where, on the other hand, the honey ferment would improve the condition of the skin, in fact, build up the tissues. The one is bacterial, while the other is a fungous ferment. One is a clog, while the other is separation of elements. One drop of creosote will arrest digestion and destroy the vitality of the organs of digestion, while toast will build up the digestion. Yet creosote and toast contain the same ingredients.

There is no desire for the taste that is in alcohol by the unperverted appetite. Appetites are formed by growths. Normal appetites are products of normal foods, and perverted appetites are products of perverted foods. It is the recurrence of affinity at all times, with no exceptions. Alcohol is fermentation extended infinitely to the end of molecular existence. Fermentation is the commencement of digestion. One means health, the other disease. The reason of the great demand for liquor is the great lack of ferment-producing foods, such as apples, currants, grapes, plums, gooseberries, strawberries, rhubarb and many wild acid fruits of former times. The evaporated milk produces acetic fermentation, where by the earlier methods of obtaining the cream and butter the fermentation was vinous. The ferment of bread and cakes and crackers is destroyed by alum yeasts and baking powders. The fermentation is working while the flour is in the grain and more rapidly as soon as it is ground. Sugar is merely the sap of the cane instead of a ripened product and the fact that it crystallizes proves that it is a drug. Ripening is the perfecting of the ferment principle of the vinous variety. Unripeness results in acetic fermentation.

The reason food products cannot be kept an indefinite length of time is that they are being digested by every rise and fall of temperature. Wheat three years old is far easier to digest in the stomach than new wheat. New wheat

requires more cooking. It has more vitality. More resistance to change. Better protection. It requires more force to break up its resistance to digestion. Cooking breaks up the resistance. Cooking is but a rapid or violent change of temperature. The digestibility of honey is improved by age. By many changes of temperature. It increases and distributes the seeds of fermentation. The older the honey the more rapidly it ferments when taken into the stomach. We can cook food until its substantial part has all been digested and has disappeared as carbonic acid gas, leaving nothing but the fibrous refuse and dregs in the kettle. A meal of this refuse and dregs will traverse the digestive tract and create no excitement, and be regarded first-class digestion, when the fact is, refuse and dregs require no digestive action at all. It requires nutritious substances to cause disease the same as for health.

If we bake a cake, using honey for sweetening, and keep the cake a year, or until it loses its sweet taste, we will see that, as the sweetness disappears from the center, it approaches the outer surface and escapes into the atmosphere, and the cake becomes insipid at the center first. Now if sugar is used instead of honey, the insipidness begins on the outside first, and the tastelessness runs deeper and deeper, until it reaches the middle of the cake. Will the reader please explain the cause of the different behaviours of the sugar and honey? Also why does the sugar cake become stale in two weeks, while it takes the honey cake six to ten months?

Bacteria are the most minute-sized plant organisms which the microscope can discern, and fungi are merely plants of the same nature, but of larger size. Bacteria can thrive upon less nutritious soil or substance in a like manner as beans can grow and do well on soil of less richness than potatoes. Then there are the weeds which thrive on poorer soil than any cultivated crop. There is the corresponding variation of adaptation between different weeds as there is between beans and potatoes. It is possible for all the varieties of fungi and bacteria to be growing at the same time in a single cell of honey. The more rapid and greater the changes in temperature, the sooner granulation takes place, and the coarser will the granules be. The granules will cohere to one another. Moisture is the immediate cause, and there are numerous degrees of richness or fertility in the moisture and honey varying from pure honey to pure water, as also of the varying qualities of the ferment vegetation. As nutritive substances is consumed or thinned, one set of plants succeeds, runs or crowds out another in the order of each one's adaptations to variations of soil. As one set of plants decay it forms a crust or film upon which a still lower class of plants (mold fungi) thrive. Whether it is an individual cell of honey in the comb or a tank containing several hundred pounds, the process will be the same in either case except that the larger bulk would require a greater change of temperature or else a longer space of time.—"The American Bee-Keeper."

Bumble-Bees to the Phillipines.

From the "American Bee Journal" I clip the following, relative to the sending of bumble-bees to the Phillipine Islands:

"The Indiana bees recently shipped to the Phillippine Islands by the Bureau of Entomology of Washington for the purpose of fertilizing clover in that country, were packed in small refrigerator baskets, and placed in cold storage as soon as caught. They will be kept in cold storage until they arrive in the Phillippines. Thus they were put to sleep in Indiana and will wake up in Manila."

Earlier in the season the writer noticed the Government's intention of shipping these bees, and quite often since, have I wondered as to the success of the venture Of course, it is too soon to know as to the benefit the bees will be to the clover, but judging from New Zealand's experience, there is not much likelihood of any disappointment. As is well known, previous to introducing bumble-bees into New Zealand, it was impossible to raise any clover seed, but now, thanks to the bees' usefulness as pollinators, that country can produce seed equal to *any* in the world.

Age of Queens and Supereeding.

By C. P. Dadant.

There has been considerable discussion from time to time, regarding the length of life of queens, and the advisability of superseding them artificially before they become too old. Some recommend annual requeening, others at the end of 2 years, others at 3, and others still affirm that the bees attend to this matter properly.

The purpose of this article is to examine the different methods and opinions of noted writers, which will help in drawing conclusions.

To get a very safe statement from writers on bee-culture, it is best to go to the text-books. Articles written for the bee-papers give many new things, but there is less guarded thought in contributions to the press than in books, for the reason that the writers of books are aware of the permanency of such works, and read and re-read their statements before allowing them to go out of their hands. Contributors to the papers, on the other hand, are apt to launch assertions that may prove incorrect. We see it daily. A very good instance of it is to be found in one of our bee-papers for January. A writer having stated that beeswax to be digested must "melt in the stomach," the editor, who is one of our brightest men, corrected him by saying that beeswax melts at about 130 degrees, which is much higher than the temperature of the stomach. The fact is, that it is a poor grade of paraffin which melts at about 130 degrees, and that pure beeswax does not melt below 144, and is still less liable to "melt in the stomach."

Looking through different leading works on bees of modern times, in different countries, we find the following opinions on the age and supersedure of queens:

German.—Dzierzon says: "The queen lives on an average 4 years. I once had a queen 5 years old which was still remarkably vigorous."

English.—Cowan: "The queen may lay for 4 or 5 years, but her fertility decreases in proportion to the number of eggs she lays. . . . Her fertility decreases after the second year."

Cheshire: "The queen may attain the ripe old age of 4 or 5 years."

Italian.—Doctor Dubini: "The case is not rare of bees substituting spontaneously a young queen for an old or imperfect queen, rearing the new one from eggs laid by the old one. Neither do they kill her. Either she dies before the young one is reared, or continues to live side by side with the other."

French. — DeLayens and Bonnier: "Queens may live up to 4 and 5 years where her laying capacity is limited. A queen will live longer in a small hive. . . . When her fecundity decreases the bees usually replace her by rearing queen-cells. The old queen is thus superseded by a younger one."

American.—Langstroth: "The queen usually dies in her fourth year, though she has been known to live longer. . . Queens sometimes die of disease or old age, when there is no brood to supply their loss Few, however, perish under such circumstances, for either the bees build royal cells. aware of their approaching end, or they die so suddenly as to leave young brood behind."

Quinby and L. C. Root: "Do not keep a queen longer than 3 years. Ever have an eye to the queen, and if she becomes deficient in any way, let her place be supplied by a new one."

A. J. Cook: "It is not uncommon for her to attain the age of 3 years in the full possession of her powers; while queens have been known to do good work for 5 years. The workers usually supersede her."

Doolittle speaks of the superseding of queens as "one of Nature's plans," and, speaking of a queen reared by the bees to replace her mother, says: "Had I not opened this hive for a month at this time, I would never have known that a change had taken place, as regards the queen."

C. C. Miller in "A Year Among the Bees": "Some queens do excellent work in their third year, and in rare cases in their fourth. If quite old they will be pretty surely superseded by the bees about the close of the harvest. . . . Many more queens are superseded after a good harvest."

The same writer, in "Forty Years Among the Bees," published 17 years later, says: "I have had good queens 3 and 4 years old, but as a rule I suspect better results might be had not to keep them so long."

Root, in the "A B C of Bee-Culture": "Some queens die, seemingly of old age, the second season, but generally they live through the second or third, and we had them lay very well even during the fourth year.

Chemistry of Honey and Fats.

By S. R. P. Fisher, Pharmaceutical Chemist.

Pressure of business has caused me to be unable up to now to reply to Mr. L. S. Crawshaw's request for a further insight into the composition of honey and fats with regard to their heat-forming properties (B.B.J., January 16, page 27). I will endeavour in the following lines to explain their composition, and to point out their special value as articles of diet, so that the most ignorant of your readers, from a chemistry point of view, may be able to follow with understanding, the only point to be taken for granted being that I refer to the saccharine portion of honey only, to the exclusion of the pollen.

Honey belongs to a class of compounds called carbohydrates, which are all composed of the three elements carbon, hydrogen, and oxygen, and the hydrogen and oxygen are always present in the proportion to form water. Note that these elements are not present in the form of water, but should circumstances arise they would combine together and form water. Other examples of carbohydrates are sugar, starch, glucose, dextrine, and gum.

Now if a carbohydrate—say honey—were burnt, the hydrogen and oxygen would combine to form water, which would pass into the air as steam. The carbon would unite with the oxygen of the air, and form carbon dioxide, which is a gas. The heat given out during the combustion is caused by the oxygen uniting with the carbon and hydrogen. In like manner, when honey is carried by the blood and comes in contact with the oxygen of the air inhaled into the lungs it is converted into water, carbon dioxide, and heat. All digestible carbohydrates give the same result. The carbon dioxide is given off from the lungs in the breath, and the stuffiness of overcrowded and badly ventilated rooms is due to the presence of this gas.

Fats are also composed of the same three elements—carbon hydrogen, and oxygen. They are rich in carbon, and the hydrogen is present in greater quantity than is necessary to form water with all the oxygen. Hence, when a fat is oxidised or burnt, not only the carbon, but the surplus of hydrogen is available for combination with oxygen from the air. It is this excess of hydrogen which makes fats in general such good illuminants and heat-producers.

The value of a food depends to a large extent on the amount of energy required to digest it. Before carbohydrates can become of use to the body they have to be acted upon by the digestive juices, which convert them into a peculiar form of sugar, which in its chemical composition cannot be distinguished from honey. It is well known that the sugar in the nectar of plants has a different composition from that of honoy. The process by which the bees convert the cane sugar of nectar into honey is supposed to take place in the honey-sac, and is therefore a digestive process. It is easy, then, to see that honey is a predigested food, and without doubt many of its virtues are due to this fact.—"British Bee Journal."

Royal Sydney Show.

AWARDS.

Judge: Mr. A. Gale.

HIVES AND APPLIANCES.

Bee Hive (open to all, any pattern): W. T. Seabrook, 1; H. R. Roberts and Co., 2. Comb foundation (3 grades, each 3 sheets): H. R. Roberts and Co., 1; W. T. Seabrook, 2.

PRODUCTS OF APIARY.

BEESWAX.

Natural yellow, not less than 10lb, or more than 12lb, in one block. Pupils Lawson Creek Public School, 1; W. Abram and Son, 2; W. T. Seabrook, 3 Natural white, not less than 10lb or more than 12lb, in one block: W. T. Seabrook, 1; W. Abram and Son, 2; A. E. Sheather. 3.

HONEY.

Extracted (Liquid).

One dozen 1lb (reputed) glass jars, screw tops, standard colour, light: Alf. J. Pankhurst, 1; John J. Calaghan, 2; W. T. Seabrook, 3. One dozen 1lb (reputed) glass jars, screw tops, standard colour, golden: W. Abram and son, 1; A. E. Sheather, 2; W. Abram and son, 3. One dozen 1lb (reputed) glass jars, screw tops, standard colour, dark: John J. Callaghan, 1; Thomas A. Murphy, 2; H. R. Roberts, and Co., 3.

Extracted (granulated).

One dozen 1lb (reputed) glass jars, screw tops, fine grain: W. Abram and son, 1 and 2; H. R. Roberts and Co., 3. One dozen 1lb (reputed) glass jars, screw tops, coarse grain: W. Abram and son, 1; H. R. Roberts and Co., 2; A. E. Sheather, 3.

COMB.

One dozen 1lb (reputed) sections (light honey), uniform size: W. Abram and Son, 1 and 2; W. T. Seabrook, 3. Dark honey, uniform size: W. T. Seabrook, 1 and 2; W. Abram and son, 3. Frame of comb honey, not less than 100 square inches; W. T. Seabrook, 1; W. Abram and Son 2; H. R. Roberts, and Co., 3. Not less than 50 square inches: W. T, Seabrook, 1 and 2; W. Abram and Son,3

BEES.

Queen bee (Italian) and her progeny, leather coloured: W. Abram and Son, 1, 2, and 3. Golden: W. Abram & Son, 1, 2, and 3.

CHAMPION PRIZE.

Collection and display of the products of the apiary in trophy form: H. R. Roberts, 1; W. Abram and Son, 2; W. T. Seabrook, 3.

Among the publications that we get in exchange a most interesting one is the "Federal Pastoralist and Rural Times of Australia," a monthly journal devoted to the interests of squatters, graziers, farmers, dairymen, horsebreeders, &c., from 52 Margaret-street, Sydney.

Enemies of Bees.

One of the interesting facts of nature is that of mimicry for protection. In one case our bees are victims to this law of mimicry. This comes through one of our little bugs, which, in my "Bee-keeper's Guide," I call the "stinging bug." This insect is known to science as *Phymata erosa*. This little bug is a good illustration of this law of mimicry. It is of a dull obscure yellow; and as it hides among the stamens of the goldenrod it is so concealed that it is difficult even for the human eye, sharpened by close observation, to discover it. What wonder, then, that the industrious honey.bee, all unsuspecting, should come fearlessly into the very clutch of this cruel stinging bug? I gave the name "stinging bug" to this little stabber, as it often punctures man himself so as to cause a severe smart.

There is another curious feature about this little murderer that is not specially joyous to the bee-keeper. It has its front legs curiously fashioned so as to grasp with them; and as it lies snugly in its floral retreat it can, as bee or other coveted insect comes to it, grasp its luckless prey with one of these strong leg jaws, and with the other, hold firmly to the flower, and then with its strong beak can pierce and suck its victim bloodless and lifeless. This phymata is widely distributed in our country, and destroys many thousands of bees annually. It is fortunate that our bees are so prolific, as we know of no way to get rid of these bugs, and we may not suffer very serious loss, for the increase in the hive with a good queen is so striking that the loss from the stinging bug is not greatly felt. —Professor Cook in "Gleanings."

A Kink in Heating Honey.

Heating of honey prevents granuation, and I believe the higher the temperature to which the honey is brought, the more effective the treatment; and it is very important to add, the greater the danger of injury to the honey. The length of time the heat is continued also has a bearing upon the danger of injury. Keeping these ideas in view, Mr. Wm. A. Selser heats his honey to a higher temperature than is usually done (168 degrees), bottles the honey, and then immediately cools it by immersing the bottles in ice water. The honey is brought to this high temperature by the use of steam heat, and great care must be exercised that the honey be not injured. Two persons are kept constantly busy stirring the honey in the tank; otherwise that next the outside would be ruined before the honey in the centre was hot enough. It might be thought that the immersing of bottles of hot honey in ice-water would crack the bottles; so it will, unless a certain ratio is preserved between the temperature of the bottles and the ice-water.—"American Bee Journal."

Should Cows be Stripped?

Should cows be stripped after milking or not? Discussing this question in an English journal, Professor McConnell, the eminent English dairy expert, says that he is one of those who all his life was accustomed to see cows stripped out by a responsible person, who followed after the regular gang of milkers; but recent events caused him to change his mind as to the advisableness of the practice. Many authorities have pointed out aforetime that, as the milk secretion was intimately connected with the nervous organisation, the stopping of the milk and then coming back to start it again were doing the cow arm, as it amounted to restarting of the nervous energy. About a year ago Professor McConnell stated his belief that stripping was absolutely necessary. He now takes it all back, as since then he has tried his cows the other way, with the most satisfactory results. They are now milked out at one sitting, and if a small quantity be left in the bag, the professor argues, it does the cow no harm, and as there is no possible

gain then in stripping, he contends that it is discounted by the harm done to the cow by the stripper in starting her nervous force once more. Alongside the cessation of stripping, however, another practice has also been abandoned—that is, the changing round of the gang of milkers, so that each cow is milked by each milker in rotation; every man now sticks to his own lot of cows, and as one cow drops out and another comes in the lots are kept as equal as possible. As far as Professor McConnell can see, the results to the cows, to the milkers, and to the milk yield are eminently satisfactory, and he, for one, will not go back to the old system.—"Australian Gardener."

Swarm Settling on a Sister's Face.

While Miss Richards, of Mabe, Corncall, was watching her bees, a swarm suddenly settled on her face and neck. Fortunately, she had courage enough to allow them to remain undisturbed, and eventually the bees were successfully drawn off and hived, without having caused the slightest injury to Miss Richards. I thought an incident so unusual and so illustrative of the lady's courage would be worth recording.—"British Bee Journal."

Melting Honey in Cans.

"In regard to liquefying honey in 60-lb. cans, I would say that, after putting the can in the water, you must remove the cap and press the top of the can down to the top of the honey by striking the top of the can with the palm of the hand, thus forcing the air out; then put on the cap and screw down tight; leave in the water until it is all liquefied, then remove and let it stand until cold before removing the cap, and you will have no over-flow, no burst cans, no foam, and no loss of aroma."—Elias Fox, in "Gleanings."

The Markets.

Dear Sir,—Just a note to let you know how honey is selling in Dublin. We find general complaints from all grocers that section honey is going very slowly on account of high prices; people will not buy at 1s per section. We have given good prices, and, although no large quantities came in, we have the greatest difficulty in disposing of honey; similarly in England they complain of prices being too high. Grocers in Dublin want an article they can sell at 8d or 10d per section at most; when it goes over that people cease to buy, as honey is a luxury and sections are lying in the shops from one month to another. There is no great demand for run honey on account of the competition of a large quantity of foreign honey. We have to complain, as usual, of the poor condition of the honey as sent in; 50 per cent. of the sections received here are either soiled, or old section wood, not fit to be put on a grocer's counter. We have also had complaints about the prices we have given for heavy sections, but as we have had to point out time and time and time again, it is no matter how perfect the comb and honey are, if the wood is soiled.—"Irish Bee Journal."

Cotton is one of the main sources for surplus honey in Central and North Texas, and much cotton honey is produced each year. There are certain conditions necessary for a good yield from cotton. Rank growth during a wet season, on rich soils, together with moist, warm weather, are ideal for a fine flow. On lighter soil, and in dry seasons, the secretion is not so abundant, no honey being obtained from it in our sandy land districts at all. The soil and conditions also affect the color and quality of the honey materially. With the most favorable conditions above, the honey will be very white and clear, while the latter conditions produce a light amber honey.—"Am Bee Journal."