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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.
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HOME MARKET FOR HONEY.

We acknowledge receipt of the follow-
ing communication from Mr. H. C. L.
Anderson, Director of the Intelligence
Department, N. S. Wales Government:—

Intelligence Department,
Corner Phillip & Bridge Sts.,
Sydney, N.S.W.,
25th October, 1907.

Dear Sir,—

The question of obtaining a profitable
market for New South Wales honey in
the United Kingdom has been receiving
some attention, and the Agent General
for this State has been making enquiries
with a view to ascertaining whether it
would be possible to induce the army and
navy authorities, as well as those con-
trolling the large poor-houses, hospitals,
etc., to use our honey.

One of the largest wholesale export
and import dealers in honey in the
United Kingdom has also expressed a
desire to have some samples of New
South Wales honey, as the Australian
honey at present on the market, princip-
ally from South Australia and New
Zealand, was not generally flavoured,
the flavour being considered objection-
able. In order to enable the Agent
General to push this matter, he is anxious
to secure a few good samples, and I shall
be very glad if you will be good enough
to favour me with your opinion as to
whether it is likely that any of the bee
farmers in the State would care to take

the matter up and submit small samples in the hope of finding a good market for the product. If you could suggest the names of any persons who would be likely to take an interest in the matter, I should be glad if you would kindly advise me.

It may be mentioned that this season London stores like the Civil Service and Whiteley's are quoting honey in open sections at 9½d. (retail), and extracted guaranteed garden honey in glass jars at 6d per lb.; bulk honey in casks, from 3 to 5 cwt., from Jamaica and other sources, is obtainable at rates little, if anything, in advance of the average Sussex Street prices for corresponding periods of the season.

Yours faithfully,

H. L. C. ANDERSON,
Director.

E. TIPPER, Esq.,

Editor, "Australian Bee Bulletin,"
Wallabadah.

We have sent the following reply:—

Wallabadah,
October 29, 1907.

H. L. C. ANDERSON, Esq.,

Director Intelligence Department,
Dear Sir, Sydney.

Your letter to hand. In reply—Many unsuccessful attempts have been made to get a Home Market for Australian Honey. In some cases, good Honey has been sent; in others very inferior—in order to clear the local market. At present time owing to ringbarking and clearing away of Box Trees, to make way for Wheat, I do not think there is much more produced than to meet the local markets. The question is—"can the industry be re-encouraged to produce more again?" To my thinking, there is no superior honey to the Yellow Box, a sample tin of which I will send you. But, perhaps, I do not know other people's tastes. In the *Australian Bee Bulletin* to be issued this week, I will make a strong appeal, publishing your letter to me.

Thanking you for your communication,

I am, dear sir,

Yours sincerely,

E. TIPPER,

A. Bee Bulletin.

"Will Beekeepers who can produce a good quality of Honey, and in quantity sufficient to assist in EXPORTING, send Samples and communicate with Mr. Anderson at earliest."

VISITED our three apiaries and put week in October. Rather disappointed with the white box flow. In fact, where we expected to do a good extracting there was no honey, and can now only look forward to the yellow box, which, though in bloom in some localities, is not out in the neighbourhood of our apiaries. The dry weather seems to be also affecting that. Our principal work was the clipping of queens, and cutting out drone comb.

The Story of Honey-Comb.

How it is Built; Why the Cells are Six-Sided; Cross-Section Views of Cells from Comb Built at Right Angles to Glass; the Wise Man and the Fool.

BY EDWARD F. BIGELOW IN "GLEANINGS,"

For many years the theories as to wax-production were far from the truth. Somewhere between 1744 and 1768 it was discovered that wax is produced between the plates on the lower side of the worker bee's abdomen. The honor of this discovery is usually ascribed to a Lusatian peasant of unknown name. But Thorley, a quaint writer of 1744, speaks of "six pieces of solid wax, white and transparent like gum within the plaits."

Wax is produced at the will of the bee, and when called for by the necessities of the hive. The wax-producing bees obtain a somewhat high temperature usually by close clustering, although they sometimes hang in slender festoons and chains.

"Wax is not chemically a fat or glyceride, and those who have called it 'the fat of bees' have grossly erred; yet it is nearly allied to the fats in atomic constitution, and the physiological conditions favoring the formation of one are curiously similar to those aiding in the production of the other. We put our poultry up to fat in confinement, with partial light; to secure bodily inactivity we keep warm and feed highly. Our bees, under Nature's teaching, put themselves up to yield wax under conditions so parallel that the suitability of the fattening-coop is vindicated."—*Cheshire*.

On the inner side of the eight plates lining the lower side of the abdomen are about 140,000 glands (*Cheshire*), from which the wax is secreted as a white liquid, which hardens on exposure to the air. When first formed it is white and very brittle, and is pulled out from between the plates by the pincers on the hind legs. The pieces of wax are then passed to the front legs, and thence to the mouth, where they are made plastic by the addition of various materials in the saliva and by thorough mastication.

From this raw material the sculpture bees make three kinds of cells. First, at certain times of the year, when a new queen is needed, they build a few large, almost perpendicular, peanut-shaped cells. The two other kinds, drone-cells and worker-cells, are practically the same in form, the drone-cells differing in being larger. As their names imply, they are used for rearing drones (the male bees) and workers (undeveloped females). Both kinds of cells are nearly horizontal, slanting upward slightly from the center to the exterior of the comb. Both kinds are used for the storage of honey, and this slight inclination facilitates the filling of the cell and prevents the honey from running out before the cap is added.

All three forms are *primarily* cylindrical. The queen-cells, isolated from the others, always remain cylindrical. All solitary

bees (not honey-bees) make such cells. The hexagonal form is due largely to mutual pressure, and partly to optical illusion. Cells near the edge of the comb, where it is attached to some support, are either circular or elongated circular.

A soap-bubble floating in air is circular in every direction—that bubble is a sphere. Let it fall on a table and it becomes flattened on one side. Let there be pressure on every part, and the outlines are no longer circles but polygons. Let a mass of soap-bubbles be confined, one layer between two sheets of glass, and they become short polygonal tubes. If sizes are equal and pressure from every direction is the same the outlines will be regular hexagons, the same as those of worker-comb cells. If these conditions vary, the outlines will be irregular polygons but mostly six-sided. Worker-cells seem to be more closely crowded together than drone-cells, and thus have their angles, in most cases, more sharply defined. In drone-comb some cells are almost without angles, the spaces between the tubes being filled in by a thickening of the cell walls greater than is customary. In such parts a casual glance shows them to be almost as hexagonal as is the usual type. But close examination or magnifying shows many cells that are cylindrical tubes. The more one studies comb the more firmly is he impressed by the belief that the original "intention" of the bee is to produce a hollow cylinder, and that the hexagonal result is due solely to the force of circumstances, and is entirely "unintentional."

A correspondent recently told me that, after her house was burned down, workmen, in clearing away the ruins, found in the cellar, amid the debris, a box of glass "marbles" that had belonged to her young son. Under the heat and the pressure the marbles had become a solid mass; they had "run together." A

workman, in knocking off the clinging cinders, broke the mass in two. The interior presented an almost perfect honey-comb effect, each marble being a spherical polygon. So cylinders or spheres, pressed together uniformly in every direction, and submitting to that pressure, become hexagonal in outline.

Much has been written about the mathematically exact angles of honey-comb. Some philosophers have stoutly maintained that the bees have solved difficult problems, and that their work is an example of the wonderful perfection of nature or of natural instinct. Many of these claims make interesting reading. Abstruse theories and complex formulæ have been contributed to sustain these claims. But they lack one essential feature, and in this they do not stand alone, even in the productions of writers on natural history—they are not true.

Actual measurements of the angles show that they greatly vary. But, notwithstanding the fact that the cells vary in size and form, comb is none the less a wonderful structure, with all its parts arranged for the greatest strength, the largest storing capacity and most perfect adaptation to circumstances. Wax is produced by the bee at a great expenditure of labor, material, and strength. Well-informed investigators say that "The costliness of wax to the bee, since it can be produced only at the expense of many times its own weight of honey or sugar has led to great economy, one pound of it being moulded into 35,000 worker-cells," while others have observed 50,000 made from that amount. To help the bee in this economy, apiarists have found it advantageous to use machinery which shall work the same material over and over. As the combs become old they are melted, the pure wax taken out and remodeled into thin comb-building foundations. But this is in no sense the manufacturing of a new product, but an extracting, purifying, and remodeling of the bees' own choice material. It simply

saves the bees much arduous labor that machinery can do easier and at less expense, when we consider the effect on the bee.

(To be continued.)

Many start out with erroneous impressions about cutting alfalfa. They have been induced to put in the crop because of its great feeding value, and that three or four cuttings may be taken from the field during one season. If you want a strong vigorous stand of alfalfa, don't be in too big a hurry to clip it to get rid of weeds, and don't cut the crop from a newly-seeded field too soon. The crop should be pretty well matured before it is cut. It is important that the plant be well established and the crown buds set for subsequent crops before the first crop is taken off. After the first year, three or four cuttings may be made, providing each one is done at the right time.—Extracted.

German, Austrian and Hungarian Beekeepers' Conference and Exhibition,

At Frankfort, A.M., August 2nd, 1908.

From German bee journals I translate a few interesting extracts.

The above organisation for nearly 60 years holds a conference and exhibition every year, but each year in a different city, this time in Frankfort-on-the-Main. There were 182 exhibits of honey of excellent quality, though the season was a poor one generally. Products manufactured from wax or honey were 67, of beeswax 63. Hives were very numerous and of all sizes and forms. Implements represent 74, and there were such as a heating apparatus for the brood-room, new devices for queen rearing, etc., also a "plough" for uncapping; improvements in the reversible extractor, etc. The exhibits of bees numbered 98, literature, 36, besides other exhibits. The American imported golden bees and queens

attracted considerable notice. The conference hall proved far too small for the large number of delegates. The first and most important transaction was the completed union of the Empire Union and the Central Union, the now united membership being over 100,000 with the prospect of 50,000 more to join in. The new name is The German Beekeepers' Alliance. This combination has been on the topics for some time past, at last it is accomplished. In consequence of the difficult task of adopting new rules, etc., only five addresses could be delivered and discussed. The fifth was:—

EXPERIENCE WITH THE AMERICAN
GOLDEN BEE.

None of the addresses are yet published in full, but a few remarks appear about each, and re the American golden bee and so-called long-tongue bee some pertinent statements are given, showing that the long-tongued are short-tongued, that the golden are nice to look at, but otherwise incomparable with their existing bees, and that it is a bee bred for colour, which means loss in other respects. One speaker called them a "swindle."

We have thus practically a repetition of what I stated years ago. I shall not be much surprised should paralysis make its appearance there, as it did here, unless they get rid of the beauties ere it is too late, and it appears they will.

The Dickel's theory is not yet dead, but if there is anything worth knowing in the paper I will translate it when I get it.

Beekeeping in Germany is still much alive, according to the facts and figures above given, and it will take Australia a long while to reach up to them, and we may do worse than learn from them.

W. ABRAM.

Italian Bee Farm, Beecroft.

A FEW CONTRA VIEWS.

1ST—RIPENING AND MATURING HONEY.

Mr. I. Hopkins, government apiarist of New Zealand, in your last issue propounds some ways and means of ripening honey, even risking his reputation, he states.

As I am not in any government service I have not time enough to take his paper fully into consideration, but I will give a few facts which are an indication of my views on the matter.

Mr. Hopkins recommends a shallow tank, and the atmosphere warm and dry. But what if the atmosphere is not warm and dry? Can the beekeeper or maturer of honey regulate the atmosphere? He did not state how. What was a success at one time often failed at another, when the atmosphere was different. The conditions vary so. Let the bees do the work, they do it well and proper, and do not meddle; the honey will be superior to that which is ripened by Mr. Hopkins' process.

Honey from the various sources varies in regard to the quantity of water contained, as it does in flavour, etc. No beekeeper or maturer will produce all honey of equal density by his device, and that some honey on the market is in a state of fermentation is perhaps a result of such advice as Mr. Hopkins now offers. In all my time I have never had any of my honey going into fermentation, because I extract it when sealed over, although I have dealt with many different varieties of honey. The weather has some influence, but the usually thin honey does not attain very markable density in dry weather, nor does the usually dense honey appear watery in moist weather, so my long and varied practical experience goes against the advice Mr. Hopkins gives. Where the maturer has all the appliances for evaporating moisture, it might just pass—not otherwise. The bees know best.

Mr. W. Reid, after his "experience with bees," buds into an admirer and praiser of the Cyprian beauties, but from what he says I wonder if they are true pure blood or only by name. Practically it does not matter, as no European or American beekeeper advocates them unless for the purpose of sale.

The heartless, cruel method practised by some beekeepers in the older countries by sulphuring the bees is by no means as bad as Mr. Reid thinks. I have seen it done, it is true; but as it is not cruel for a squatter to sell thousands of sheep to be killed, nor is the beekeeper. Circumstances and conditions compel him to reduce his stocks every autumn. Out of a hundred straw skeps he selects about twenty of about the right weight, the rest - too light and too heavy - are sulphured, and the honey is cut out and sold at from 6d. to 9d. per lb. Now these twenty increase next season to a hundred or so, and the same process awaits the light and heavy skeps, but the light skeps are usually kept in readiness for next year's first swarms. What would he do with all the bees if he did not sulphur them? If he kept them in frame hives he would have to cut the comb out too, as the honey, buckwheat and heather, does not extract easily. These heather bees are the best breeders, swarmers and honey gatherers, and the continuous selection of the medium brought the characteristics about, assisted by speculative feeding in spring. These beekeepers know their business.

W. ABRAM.

Beecroft.

CORRESPONDENCE.

J G.C., Kangorilla, S.A. - We have experienced a very dry, cold winter, the hardest one that I can ever remember. There has been a light honey flow all

through the winter, and the bees have come through in good form, very few having died. There is a very good show of red gum to bloom this coming summer, also a fair sprinkling of blue gum; but it is the off season with us about this part. Wishing you a prosperous season and every success with the "A.B.B."

J.C., jr., Bulli, writes: - Oct. 14th, 1907. I might state I would not be without your paper for anything, because I get so much valuable information from it, and every month I am anxiously waiting for its arrival. We had a poor honey flow here last year, only about 10 cwt. of surplus honey altogether, but we left them well stocked for the winter and every hive pulled safely through. We are badly in need of rain down here, and I'm afraid its going to be serious if we don't soon get some. This time of the year the paddocks should be yellow with dandelion, but now you seldom see a flower, and we depend on that chiefly for our pollen. I trust you are in for a good season up there and wishing you and your paper every success.

[Unfortunately it is much the same here, very dry. - Ed. -]

Mr. Thos. Pike, Candelo, wishes to get half a ton of honey at 2½d. per lb. landed in Sydney.

Sugar and its Dangers.

A German scientist of high repute, Dr. Von Bunge, in the *Journal of Biology*, has just published an article, "The increased consumption of sugar and its dangers." This German *savant* says it is well known that children who eat much sugar have bad teeth, and are pale, and this is undoubtedly due to lack of phosphates, iron and lime. This information comes from Germany, where the price of sugar is very high and the consumption limited. It is in Great Britain, where the consumption of sugar is far higher than in any other country, that sugar diseases, notably

diabetes, are more common than elsewhere. It has been observed that in cane-sugar-producing countries, on the other hand, the negroes employed are fat and healthy yet this does not alter the case any because these laborers never use our white sugar and, in fact, are in the habit of extracting the juice of the sugar-cane by means of their own teeth. In using sugar they much prefer raw sugar made by a simple process similar to our method of producing maple sugar in the woods.

As a remedy, Dr. Bunge proposes that the German government largely increase the revenue tax on beet sugar produced in the empire of Germany.

— *Gleanings*.

How Does the Queen Fertilize the Eggs.

This question has not yet been answered. It has been held that compression on the queens abdomen in the act of laying will cause fertilized eggs to be laid, but I do not believe that there is anything in it. There are several reasons for this. First, when a queen lays in newly-built comb with cells only $\frac{1}{8}$ -inch deep, there can, of course, be none of that so-much-talked-about compression of the abdomen. Neither is there such when eggs are laid in queen-cells, most of which are very wide mouthed and shallow when the egg is deposited in them.

In a recent issue it was hinted editorially that perhaps the depth of the cell has something to do with the position of the queen when laying. It was thought that there may be something in this as regards the difference in depth of drone-cells and worker, the latter being shallower than drone-cells. As the writer had never seen that eggs were laid in shallow drone-cells or before they were fully drawn out it might be true.

But, are not, in most cases at least, the cells of a comb all of about the same depth as long as they do not yet contain brood the drone cells being later drawn out

longer than the worker when the brood is capped? Then, too, I have seen eggs laid in drone-cells considerably shallower than the worker-cells on the same comb; the drone-comb being in batches at the lower corners where the comb is generally more or less rounded off.

And, again, I have seen eggs in newly built drone comb with cells only $\frac{1}{4}$ -inch deep, and the cells were only later drawn out full depth. Anybody can try this during early summer, when the queens are anxious to lay drone-eggs, by simply giving an empty frame in the brood-nest.

And all this goes against the "compression of the abdomen" theory, and that of the different depths of the cells.

— *American Bee Journal*.

Attacked By Bees.

At Foulburn, near Cambridge, England, lately a waggoner and a pair of horses were attacked by a swarm of bees while passing over a hill. Horses and man alike were severely stung, but the man managed to keep his horses under control until assistance arrived, and they were removed to an adjacent farm. It was found that they were severely injured. The veterinary surgeon at first reported that they could not recover, but they are now progressing satisfactorily. The man had to be removed to hospital.

Value of Protective Surroundings.

Over at Port Huron, where I met my Waterloo last spring, there was a sheltered nook at one corner of the yard. The wagon-shed, the barn, a high board-fence and one or two big apple-trees, all combined to shut off the cold north or west winds. Scarcely a colony perished in that sheltered nook; and even of those that lived, not one was as strong, when I moved them away, as were most of the colonies in the sheltered corner of the yard. Away out in the field, beyond the influence of this shelter, scarcely a colony was left alive, and those were weaklings.

It seems strange that some of us are so long in learning the true value of outside protection in the winter and spring.—“Bee Keepers' Review.”

Swarming.

Adrian Getaz. in the *American Bee Journal*, gives the following from a French publication:—A Frenchman in the North East of France has been making careful notes on bee-swarming. Australians can reverse the seasons our Summer being their winter. Taking all the information obtained in consideration, the average number of first swarms is put down in the following proportions: One-fifth in May; $\frac{1}{2}$ from June 1 to June 10; $\frac{1}{4}$ from June 10 to June 20; 1-10 after that date. Very few swarms come out before May 25, and very few after June 20, so the apiarist could go to the expense of close watching only between these dates.

TIME OF THE DAY.

The limits observed are 8.15 a.m. and 4 p.m. in the extreme cases. On the total number observed, 5 per cent. issued before 10 a.m., 22 per cent. between 10 and 12, 56 per cent. between 12 and 2 p.m., 15 per cent. between 2 and 3 p.m., and 2 per cent. after 3 p.m.

BEE-HIVES IN MOURNING.—A striking illustration of the superstitious beliefs of Cornish country folk may be seen in one of the villages of the Duchy. A death recently occurred in the family of a bee-keeper, who thereupon—believing that if he failed to do so the whole of the bees would also die—draped each of his five hives with a piece of black crepe.—*English Paper.*

W. Abram, Beecroft, writes:—We are experiencing a very bad time of it now, when orange blossom honey should be coming in freely—not a drop! Every day westerly winds.

WANTED, Experienced Young Man among Bees. O. LUDLOW, Sutton Grange Apiary, Victoria.

PRICES OF HONEY.

Melbourne Australasian.—Honey.—The demand is inactive, from 2½d to 2¾d for prime clear extracted lines; cloudy or inferior being difficult to place at lower values.

Melbourne Leader.—Honey.—The demand is not sufficient fully to absorb supplies available, buyers taking up quantities for immediate needs. Prime clear garden samples have sale at from 2½d to 2¾d, medium to good realising down to 2d. Beeswax.—For prime wax sellers are obtaining up to 1/1, more money being asked for extra prime grade. Medium to good sorts are to be had at from 1/-.

S. M. Herald.—Honey.—60lb tins, extra choice extracted 3¼d to 3½d, prime 2½d to 3d, good 2½d, inferior and candied 2d. Beeswax.—Bright, 1/3½ to 1/4, dark 1/2 to 1/3 lb.

Maitland Mercury.—Honey, 2½d; small tins 2/- to 2/3.

HONEY.—

There is a scarcity of really choice quality, and we can do with consignments of Western district, which will realise 3¼d. Northern River lots are worth from 2d. to 3d., according to quality.

BEESWAX.—

The demand is slightly easier, dark 1/2½ to 1/3, choice lots up to 1/3½.

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A NOTE ON THE DAILY LIFE OF THE HONEY BEE.

(Continued from p. 102, Aug. issue.)

PROF. F. KUHLMANN IN "AMERICAN BEEKEEPER."

When not in the busy season of pollen and nectar gathering, or when from other causes she does not go out, she spends most of her time in the hive in what seems to be aimless moving about over the cells, looking into one now and then, and occasionally stopping to feed another bee or be fed by it. A very large proportion of the time is spent in barbering herself, for which purpose she may stop as often as every minute. The various duties of the hive, such as ventilating, building and capping cells, and feeding the larvæ queen and drones, seems to require such a small proportion of each individual's time that I have observed it but a few times with the 8 marked bees of which I have individual records. Between these other activities she changes off from one to the other at frequent and very irregular intervals, and, like the queen, does not persist long at a time in any one. I give the following again as a typical 20 minutes' observation on a marked worker: Time, 1-2 p. m. "1. Moves about for four and a half minutes, looking into two cells. Barbers herself for 30 seconds. 2. Moves about for four and a half minutes, looking into six cells. Barbers herself for 30 seconds. 3. Is fed by a worker for 20 seconds. Moves about for a minute and a half. Rests three minutes. 4. Rests a minute and a half. Moves about a minute. Rests two and a half minutes." When busy gathering pollen and nectar she has a quite fixed procedure to go through, to which I have not observed many exceptions. While moving slowly about in the hive in her usual way she may suddenly start to barber herself very vigorously, and then start in a wild run all over the hive, lasting sometimes for five minutes. This running is almost an invariable performance before she leaves

the hive. She may be gone from a few minutes to an hour, depending probably mostly upon the distance she has to go for the flowers. When she returns and enters the hive one of two things or both almost always occurs. She may stop in a wild dance for a minute or more, consisting of a vibratory lateral motion of the abdomen. This seems to be for the purpose of preventing the other workers from robbing her of her pollen. At least when she is going through this performance several workers are generally arranged around her, making an occasional dive for her pollen baskets. But this apparent attempt at robbing seems to be initiated as often by her dancing as *vice versa*, for she often begins the same when no other workers are near her. After this, or in place of it, she generally spends a minute or two in thoroughly barbering herself, and then proceeds to find a pollen cell and unloads.

On the distribution of her activity over the twenty-four hours of the day I have the results of the observations as stated before. The eight marked workers were watched on an average about twenty-four hours each. But they were generally watched twenty minutes every hour, instead of every three hours, and at the times when they were apt to leave the hive they were watched all the time. Only seven bees figure in the results of the next table, which gives the average time spent in resting for the different three hour periods of the day, figured on a twenty minute basis.

	A. M.				P. M.			
	12-3	3-6	6-9	9-12	12-3	3-6	6-9	9-12
Min. rest	2.23	1.92	1.44	.66	1.25	1.68	1.14	2.29

With the exception of the 6-9 p.m. period this gives a fairly even curve. This low figure of 1.14 is undoubtedly, I think, accidental, and would disappear in the results of more extensive observations. The remainder would seem to indicate that they do about twice as much resting from 9 p.m. to 3 a.m. as during the rest of the time.

The number of bees resting in the whole hive were also counted every hour of the day and night for forty-eight hours, but this was done in about twelve hour sections, on different days, so that the results are not of a continuous twenty-four hours' observation. The number of resters thus to be counted at the same hour on different days seems to vary very greatly, and a more even curve would be obtained from a larger number of counts. It is not very easy, in fact impossible, to make an accurate count, because of the fact that they will be resting one-half minute and moving about the next half minute, while it takes about fifteen minutes to complete the count. Besides, many are often in the cells and others so thick on top that the cells cannot be seen. However, this, a considerable source of error, should not differ much from hour to hour, so that the relative number counted from hour to hour would remain the same, and thus not affect the results except in absolute numbers. The following are the results counts. The figures are average number of bees resting at the different hours of the day and night:

A. M.				P. M.			
12-3	3-6	6-9	9-12	12-3	3-6	6-9	9-12
778	756	374	327	217	328	493	680

These figures disagree with the results of the observations on individual bees in so far as in the previous table the maximum amount of resting at any time was only about two and a fourth minutes, while this table shows that nearly a third of the bees are resting from 12-6 a.m. This may be due to an error following from the condition of the counting, or it may be a real difference in the number of resting bees for the different weeks when the observations were made. The latter would seem the more probable. The results agree on the main thing, the relative amount of resting done from hour to hour.

The number of bees coming in with pollen per twenty minutes was counted every hour for a number of days. Since

they also bring in nectar besides pollen, this is not a measure of their activity outside the hive. Also, the degree of their activity varies very much with the condition of the weather, the season, the general condition of the hive, and the distance they have to go for flowers and their abundance. On a cold and cloudy day they may not go out at all to gather, especially not if it is a little damp. Their period of greatest activity is in the spring months when the fruit trees are in bloom, unless they have a special and abundant crop of flowers at another time. Also, the number of larvæ and thus the demand for pollen and honey determines the degree of their activity in gathering. Consequently absolute figures in this matter are of little value, since they may vary over a very wide range. Of the individual bees watched, only two ever went out to gather pollen while under observation. Two of them were younger than the age at which they are supposed to begin to go out. Of the former two, one made a 40 minute trip from 8-9 a.m., a 46 minute trip from 9-10 a.m., a 10 minute trip from 11-12 a.m., and a 10 minute trip from 2-3 p.m., of the same day. The other made an 18 minute trip from 8-9 a.m., a 40 minute trip from 10-11 a.m., and a 45 minute trip from 11-12 a.m. of the same day. Both remained in a state of dead rest for all but three of the 120 minutes they were observed at different hours during the afternoon of the same day.

The counts made on the number bringing in pollen were as follows: On the first hive: May 13, counts recorded for every ten minutes throughout the day, beginning at 8 a.m. May 20, counts made for twenty minutes of every hour of the day, beginning at 10 a.m. May 21st, counts made for twenty minutes of every hour from 5 a.m. to 11 a.m. On the second hive: Counts made for twenty minutes of every hour for five days in July, excepting that on two of these days the counts did not begin until 8 a.m. The next table gives the results.

	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
May 13.....				253	177	114	114	84	83	67	60	47	22	0	0
May 20.....						80	32	35		28	33	41	56	84	0
May 21.....	3	13	167	142	38	19									
Av. July.....	10	12	28	49	64	37	26	30	29	30	34	14	3	0	0
Gen. Av.....	7	13	98	148	93	63	57	50	56	42	42	34	27	28	0

These figures are upon a 20 minute basis, the averages being average number of bees coming in with pollen per 20 minutes. They illustrate well enough the differences in the amount of pollen gathering from day to day, and from month to month. They also show that the changes in activity during the day may be different one day from that of another. The average shows a maximum activity near the middle of the forenoon, and then a gradual decline during the rest of the day. But on May 20th their activity reaches a second maximum in the evening. More observations will have to decide the relation between the amount of their activity and the temperature. The average gives some idea of the amount of work the individual bee does in the line of pollen gathering, assuming that they all do an equal amount. Upon this basis of this average the probable total number of trips made by the hive in a day for pollen is 2,274. With 1,800 workers in the hive this gives a little over 1.3 (one and threetenths) trip per day for each worker. If the few observations on individual bees were any indication at all of the truth this suggests that not nearly all the workers assist in gathering pollen. For according to their records the total activity of the hive should be higher. It must be remembered, of course, that the degree of activity varies over a wide range, and that the hive observed possibly represent considerably less than the average degree. Yet a little figuring indicates that if their work were equally distributed the individual bee would have to do very little in order to make a very busy looking hive. Cook estimates that a hive has from 1,500

to 40,000 workers. Assuming a hive of 20,000, and having each worker making five trips a day for pollen gives a steady stream of bees with pollen entering the hive at the rate of 2.3 bees per second, for twelve hours of the day. This would make a quite active looking hive.

Clark University, Worcester, Mass.

Sweet Clover

Is classed as a noxious weed in New South Wales, but a writer in "Gleanings" says:—I have fed sweet clover and sweet clover hay at various times and for various periods during the past ten years or more, and I never noticed any injurious effects from it whatever. In fact, at one time when we fed our three Jerseys for several weeks on nothing but sweet-clover hay and bran, we decided, according to my recollection, that it made a little nicer butter than anything else. At any rate, private customers gladly took it at the highest marked price. The idea of adding it to other varieties of hay is doubtless good; but it should be done at the time the hay is made and stacked away. I wish some of those who are skeptical about the value of sweet-clover hay could have watched my horses several weeks ago. We had cut a small quantity of sweet-clover for hay, and put it into the barn alongside old alfalfa hay on which the horses had been living all winter. A few days later the young man who had been doing the feeding came to me and said, "That sweet clover makes fine hay. The horses like it better than alfalfa. I have been trying to get them to use up the old hay by mixing the new hay with it, but they will hunt out every bit of the sweet clover before they will eat any of the old hay."

The Isle of Wight Bee Disease.

The "British Bee Journal" thus describes above:—The disease is eminently one of the digestive system, and might be described as being condition of enlargement of the hind intestine. Over 150 diseased bees have now been examined, and all have been found to exhibit the same symptoms. The colon and adjacent part of the rectum are enormously distended with a congested mass of material consisting primarily of pollen grains. The distension is so marked that this section of the alimentary canal becomes extended from two and half to four and a half times its normal capacity. When the dorsal integument of the bee is removed the greater part of the abdominal cavity is seen to be occupied by the very greatly enlarged hind intestine. In extreme cases the rectum almost as far as the anus is also distended, and the small intestine as well. At first sight it would appear as if the chyle stomach was greatly distended, but further examination shows that the latter becomes pushed to some extent out of its normal position and is partially flattened by the pressure that is exerted upon it. The greater part of the abdominal cavity, which is normally a hæmocoelic space, is thus occupied, and, furthermore, the distended colon exerts pressure on the large abdominal air-sacs of the tracheal system and so interferes greatly with their function. The insect is therefore unable to expand them with sufficient air, which is necessary for flight, and this feature, coupled with the additional weight in the digestive canal, renders the insect incapable, when badly diseased, of flying about. The movements of the legs are not impeded, but the insect only seems to have energy to crawl about in a lethargic fashion. The fact that it cannot fly is not due to paralysis of the wing-muscles; diseased bees have been kept under observation, and occasionally they have been seen to vibrate their wings actively with a peculiar buzzing sound. Moreover, if a diseased bee be held under

the thorax lightly with a pair of forceps it will vibrate its wings very rapidly in its efforts to free itself, thus showing that there is no paralysis of the wing muscles. Bees in the last stage of the disease, however, do not seem to have strength to move their wings at all. While the hind intestines is thus gorged with pollen, &c., the stomach and the remaining portion of the digestive canal contain very little solid matter of any description. Some amount of dark-coloured fluid is present very often in the chyle stomach, but it is not distended with it.

The contents of the pollen grains were found for the most part to be partially digested, and in many cases only the empty coats were remaining. They are are but little crushed or distorted, and their species could probably be identified if necessary.

Dissection of Queens.

M. Weygandt gives a very simple method of dissecting a queen in *Deutsche Illustrierte Bienenzeitung*. If he finds a dead queen his practice is to ascertain if she was fertilised. He takes hold of the thorax and the attached part of the abdomen between the thumb and forefinger of the left hand. Then with small pliers he gets hold of the point, the last segment of the abdomen, and pulls from left to right. The two last segments, which are firmly joined together, and contain the seminal vesicle, easily separate from the rest of the body. Placing this on a board or piece of cardboard, and pressing it slightly, the vesicle is forced out and can be examined at leisure. He then takes a very fine needle, and pierces the receptacle. If a clear watery fluid exudes, the queen has not been fecundated. If, on the other hand, the fluid is opaque, darker, of a yellowish-brown, gelatinous or viscous, she has been properly fecundated. These observations have on several occasions been corroborated by microscopical examination.—"British Bee Journal."

Dual Introduction of Virgin Queens.

Up to the time when each young queen must have a separate domicile, the rearing of queens is a comparatively inexpensive matter. A large number of cells may be started in succession by a queenless colony, and when fairly started, if they are placed over a colony with a laying queen, an excluder between, the work of feeding and sealing will proceed satisfactorily. The expensive part comes when each virgin insists on a separate establishment. A queen may lay when she is 8 days old, especially in a strong colony, but in a nucleus it is oftener 12 than 8.

The plan of Editor Root, of having 2 virgins in a nucleus at the same time, practically accomplishes this shortening. Into a colony having a free virgin a caged virgin is put, in a provisioned introducing-cage, but so arranged that the bees cannot get at the candy to liberate the virgin. When the free virgin becomes a laying queen, she is removed, the covering is taken from the candy so the bees can liberate the caged virgin, and at the same time another caged virgin is put in the nucleus.

Thus each time a laying queen is taken from the nucleus a fresh caged queen is put in, there being always 2 queens in the nucleus. A virgin is 5 days old, or older, before she flies out to be mated, and the economy comes in having her spend a good part of this 5 days in a cage instead of occupying the whole attention of a nucleus.

The question that can be raised in objection is whether a queen is just as well off imprisoned in a cage as when at full liberty. One would be inclined to think not, but those who have practised the method say they can see no difference occasioned by the imprisonment, and if any harm could come of it one would suppose that someone would have said so before this. Moreover, it is the custom of the bees themselves to practise this imprisoning to a certain extent. When

a strong colony sends forth a prime swarm, a number of young queens mature in the cells, and if the ear be applied to the hive the evening before the second swarm is to issue, a number of young queens may be heard quahking in response to the piping of the first emerged one. All these quahking queens are held prisoners in their cells, and this imprisonment may last a considerable time, especially if bad weather occurs to delay swarming. G. M. Doolittle tells of one case in which a young queen was laying within 3 days after leaving her cell, having been kept in her cell by the workers during a spell of bad weather. It would seem no worse to imprison a virgin in a cage than in a cell. Indeed, the advantage should be on the side of the cage, which allows greatly more liberty than the cell.

On the whole, it would seem that dual introduction of virgin queens has much to commend it.—“American Bee Journal.”

Sweet Clover in a New Light.

The *Australian* of April 6, has the following:—The missing specimen has come to hand, and has been identified by the Government Botanist as the *Melilotus alba*, the white flowering mellilot, an introduced plant belonging to the *Leguminosæ*. The odor of the plant is due to cumarin, which in excess acts as an intoxicant, and also gives a strong flavor to milk and butter. In moderate amount, however (10 per cent. or so), it adds to the flavor and palatability of the hay or herbage; but it would be highly inadvisable to allow stock to graze entirely or mainly on this plant. As in many other cases, a little is good and excess is injurious.

In reference to above *Gleanings* says:—The idea of adding 10 per cent. of sweet clover to any other fodder to give it palatability is excellent—more especially so in the case of corn silage, which is lacking in taste and nutriment. If we

could induce farmers to see the practicability of this idea, sweet clover would probably become a prominent farm crop. In other words, the fodder would be flavored with vanilla (cumarin). Quite possibly the objections to silage as a feed for milch cows would disappear if sweet clover were added to it in a proportion of 10 or 20 per cent. It is worth thinking about, and some experiments ought to be made at once; for sweet clover grows easily in the corn-producing States. Beekeepers would do well to call attention to this suggestion in all agricultural papers.

Do Bees remove Eggs and Larvæ?

To the above question, a writer in the "British Bee Journal" says:—Having a straw skep, with boarded top and hole in centre of same, from which I intended some short time ago to have made an artificial swarm, I found on turning up the skep that one of the centre combs had broken away from the top portion about half way down, and that this bottom part of comb was filled nearly up with fully-sealed brood, which I reckoned would take about a week to hatch out. I therefore left the stock as it was and made an artificial swarm from another lot. After about a week (*i.e.*, on July 4) I again examined this skep with the broken comb and found almost all the sealed brood hatched out, but that there was now several inches of unsealed larvæ some three or four days old from eggs which had evidently lately been deposited by the queen. I then removed this piece of comb and with a piece of wood skewered it upright on the top of the skep over the hole in the wooden top. The bees were left clustering on the comb, and to prevent, if possible, a chill, I put another straw skep over them, and the earthenware pan over all.

On July 8, at 3.40 p.m., I again examined this piece of comb and found the bees thickly clustered thereon, but on very carefully inspecting it, after

brushing the bees away, not a trace of brood could I find. This made it clear to my mind that the bees must in the four days have removed all the unsealed larvæ, presumably into the skep combs below. Seeing that the bees can do this thing, and also steal stores, who shall say that they never purloin an egg (with which to make a queen) from a neighbor?

Church Candles.

W. N. PEYELS IN "AMERICAN BEE JOURNAL."

In reading up on beeswax in one of the standard bee-books, I noticed a cut of a big candle under which was the title, "A Mammoth Candle for Sacramental Purposes"—a statement which is as incorrect as it is misleading. Candles may be used or lit during the administration of some of the sacraments in several of the churches, but they form no part of the service, that I am aware of. A lighted candle is used as a symbol; that and nothing more, so far as I know. Every Roman Catholic church uses one of these mammoth candles during a certain season of the year, commencing at the close of Lent. This reminds me that in a late number of "Gleanings," the editor, in mentioning some of the uses to which beeswax is put, mentions that the Catholic and Greek churches use large numbers of them on the altars. This would lead the uninformed to believe that all the candles used in such churches were none other than beeswax. The law of the church calls for at least *two pure beeswax* candles to be lit on the altar during the offering of the mass. From this it may be seen that all others may be of any other material—sperm, tallow, etc. And the same writer further stated that wax-candles were used for the reason that they did not produce a smoke that was injurious to the ornamentation of the interior of the edifice. I do not know where the editor received his information; I know as a fact oil-lamps are used in country churches; in the

city gas is the usual illuminant along with electricity where the latter is procurable. Gas, in time, smokes up a church badly; still, it is used universally, showing that candles are not demanded.

If one is of an investigating mind, he will find that in some churches, what appear to be candles are nothing more than porcelain made in imitation of a candle. A small gas-tip or burner is set where the wick should be. If all the Roman Catholic, Greek and some forms of the Episcopal church were to use beeswax-candles exclusively during their services, there would not be sufficient wax produced to supply the demand. And, perhaps, it is well they don't, for it would, to my mind, be a useless waste of good material—a product demanded for use in the arts and sciences. The church seemed to recognise this fact, hence the minimum limit of two candles at the sacred service.

Molly Coddling.

Adam Lathan in "American Bee-keeper" says:—At home I have numerous colonies with 2,600 square inches of comb surface. The brood-nest in fall is not usually so well filled and the bees are fewer. At home I am constantly looking to the welfare of my bees, contracting entrances when it seems desirable, feeding when food gets short, and practising spring stimulation. Even the entrances, on the other hand, of those colonies on the hill are left unchanged, summer and winter, and spring even, they are full size, about 15 square inches, never less than 10 when conditions are normal. Those colonies are never molly-coddled, while the home colonies are most carefully nursed.

It has now for several springs been noted that the colonies on the hill surpass the home colonies all through the spring, being by April 15th what the home colonies are May 10th, nearly a month ahead.

All through this abnormally cold spring the home bees had access to a pan of warm water, kept warm by a brooder-stove contrivance. They patronised this pan well, sometimes taking three gallons of water a day, and carrying water on days when they could not possibly have gone to natural sources for water. (I even saw them carrying water one day while snow was falling and the temperature was only 35). The hill-colonies all through the cold spring were obliged to get their water as best they could.

Routed by Bees.

During a Wesleyan stone-laying ceremony at Melbourne St. Andrew, Dorset, an extraordinary incident occurred. A swarm of bees from a hive in an adjacent garden attacked the assemblage with such fierceness that the minister and people fled in all directions. Quite a panic prevailed, and several persons were badly stung. The routed congregation sought refuge in the adjoining chapel, where they were suitably addressed by the presiding minister, and when the report was brought in that the angry bees had dispersed the ruffled Methodists returned and concluded the rite that had so unceremoniously interrupted.

Larvæ of the Wax Moth.

After mating the female moth deposits inside of two or three days about 80 small white or yellowish eggs which grow darker with age. They are usually found in the accumulation on the bottom board, in cracks inside, seldom on the combs themselves. As soon as the eggs have hatched the minute worm spins for itself a tube-shaped house for its own protection. It feeds on wax and bee-cocoons, also pollen, which, however, is not necessary (?) for its development. Wax is their principal food, but in absence of it they gnaw wood, leather, paper, dry leaves; they even eat their own excrements. When the larva has

reached its full size it leaves its hiding place and encases itself in a cocoon somewhere, either between the frames and the hive wall, or some similar place. Sometimes it takes the risk of making its way through the entrance of the hive to a secure place outside, and is thus often surprised by bees and killed. The cocoon of the large variety is smooth; that of the small variety rough and mixed with bits of wax. The time required to mature the mature insect from the egg is fifty days. In case of the small variety a few days less. They pass the winter in dormant state. The pupae endure a temperature of 10 degrees F. with impunity. The eggs remain unchanged all winter and ready to hatch as soon as the temperature becomes warm enough in the spring.—*Deutsche Imper a-B*, per "American Beekeeper."

MOVING BEES.

When moving bees during hot weather give them plenty of ventilation. The hive cover should be removed and a cover of wire gauze be placed on the hive, better still, if the bees are to be moved any great distance, make a rim just the size of the hive and about two inches deep and tack the wire netting to this. The space between the top bars and the wire will give the bees a space to cluster and expel the heat and prevent the combs from melting down. Bees become very much excited and over heated when shut in, and if possible should be moved at night.

Artificial Swarming.

The following plan comes from America:—Furnish an empty hive with frames and foundation, leave out the centre frame, and place this hive on the stand of the colony you wish to divide. Next find the queen and place the frame she may be found on in the new hive. Now put a queen excluder on the top of this new hive, then the old colony on top

of the excluder, and add a frame of foundation instead of that taken from the old colony, and close up the upper hive, care being taken that there are no drone brood or drones in the queenless part. Separate them in ten or eleven days, putting the old hive on a new stand. It will then be mostly full of young bees and capped brood, and in twenty-four hours will be in capital order to accept a queen or queen cell. The queen by this time will have a lot of brood started in the lower hive.

Cause of Dysentery in Bees.

M. Freudenstein says, in *Münchener Bienenzeitung*, that if bees do not get access to honey they consume an excess of pollen, which produces certain fermentable residues in the intestine, and before long the disease breaks out. He gives the following as the reason:—During winter bees cluster in the centre of brood-combs, which generally contain very little honey. Round this cluster cells contain pollen, and further still the winter provision of honey. Supposing that the supply of honey nearest to the cluster is exhausted, and the cold prevents the bees from getting access to that beyond their reach, and, starving from hunger and cold, they resort to pollen, which they consume in excess, the more so as the water and honey necessary for its proper digestion fail them. The undigested residues accumulate in the intestine, commence to ferment, and dysentery soon breaks out. The same thing happens if bees have excess only to the very thick honey or gelatinous honey like that from heather.—"British Bee Journal."

Statistics for New York State just issued show that in the last 25 years farm lands in the State have decreased in value by 170,000,000 dollars. In that time 12,000 farms have been abandoned, the rural population having been attracted to the cities.

CAPPINGS.

FROM DIFFERENT SOURCES.

According to the quotations of the "American Bee Journal" common bees were imported into Florida by the Spaniards previous to 1763, for they were first noticed in west Florida in that year. They appeared in Kentucky in 1780, in New York in 1793, and west of the Mississippi in 1797. In 1857 they were taken to California.

When moving bees, cut a strip of burlap two or three inches wide, the length of the entrance to your hive for each colony, and when ready to close them, leave these in a pail of water. Crowd one into each entrance with a jack knife; better than sticks, screen or anything I ever used. No hammering to disturb the bees, and the moisture tends to quiet them, as well as being much the quickest way. For the top have a frame of 7-8 inch stuff covered with wire screen, the size of your hive body, with a piece of tin tacked on each corner one inch wide and five inches long extending two inches down to tack to hive, with tacks or two-penny fine nails that can easily be loosened with a screw-driver. Use butter tub staples to fasten supers to bodies as one of the handiest things.—*Extracted.*

Originality is the rarest thing on earth. We are a race of mere copyists. The wisest saying of our deepest thinker, like the highest exploit of our most startling scientist, is a mere rehash of antiquity. Carlyle was accused of having said a clever thing when he described the population of England as "thirty millions, mostly fools"; but, centuries before, Horace had said the same thing of his countrymen, and there never lived a man except Adam, who might not have given origin to the phrase.—"Irish Bee Journal."

The Editor of the "Irish Bee Journal," speaking of the backwardness of the season in Ireland, says in his own apiary, he was "feeding" up to July 9, when the rain stopped.

A German bee editor writes:—A queen reared at the opening of the swarming season is not likely to come off with a swarm during that season; a queen can not become exhausted in a nucleus, and he has never known such a one to swarm; In Dr. Miller's foundation treatment the queen is allowed a rest, etc.

Never use too much smoke. Its flavor improves hams and bacon, but not honey. The editor of the "American Bee Journal" says:—When you wish to light your smoker, take a rag 5 or 6 inches square, roll it into something like a ball, touch a match to it, throw it into the smoker, quickly fill the smoker with fuel, and then blow. No fear of putting it out; if the smallest corner is lighted it will not go out till the whole rag is burnt up, and if your fuel is at all fit, it will be surely lighted. A supply of saltpeter rags prepared in the spring—the preparation is a trifle—will save many a 5 minutes throughout the season, as well as some loss of temper.

[In our opinion no smoke equals that from the bark of the Australian apple tree.—ED.]

No matter how populous the colonies, it is little use to put on the sections when no honey is coming in from the fields, for the bees will do no work in them, while with some colonies the bees will insist on tearing down the thin foundation put in the sections to help them start, where they cluster in the sections before any honey is coming in from the fields.

The value of Honey imported into the United Kingdom in the month of June, 1907, was £5,454.

The 19th edition of British Beekeepers Guide Book is said to be translated into seven languages and consist of 19,000. copies.

As a preventive of injury done to bees by swallows, a writer in the "British Bee Journal" says:—I have put up a number of 12-ft. poles about the apiary, and run numerous strands of cotton thread from pole to pole. Whether this will be a permanent cure remains to be seen, but I can only say that since they were put up five days ago the raids of the swallows seem to have ceased.

An American writer says:—I have a strain of bees that work a long time without a queen, which is pretty well filled with brood, and I have had strains of bees that had no queen for ninety days and still have bees. I know that there is a race of bees that live 45 days. It is those bees that are most industrious and have the best wing power and the longest life that get our honey.

At a meeting of the Colorado Beekeepers Association Mr. Rauchfuss gave the following report on Cuban honey:—The past several months I made a visit through the middle states, and visited some of the honey merchants. I have not found the Cuban honey in the comb but some extracted honey shipped in right along. We find that it averages about 200 barrels a week weighing about 500 or 600 lbs ranging in quality from white to a very dark amber. A good many of those that had gone into the business there have given it up again for personal reasons, or for business reasons. There are few people there that are making a good thing out of it. I happened to speak to a beekeeper that had been in Cuba and examined the conditions there, and as for him he would rather be excused from keeping bees there.

I find it particularly unsafe to keep a queen that has done uncommonly well in a colony that has been worked for extracted honey. One colony so worked last season became very strong early this season. Just before the time for supering an examination showed that the colony, although quite strong, had no brood, sealed or unsealed, and there was no sign

that the queen had been superseded. I gave combs of unsealed brood repeatedly in order for the bees to rear a queen, but they persistently refused to start queen-cells. Later I found brood in one of the combs which I had not given them, and so it seems they did supersede the old queen, but so late there could be no surplus from the early flow. In other cases I had queens that began laying and had two or three patches of brood the size of a hand, and then died. On the whole I conclude that it is safer for the apiarist to do a good deal of superseding himself and not wait for the bees to do it.
—*Extracted.*

If a queen is balled in her own hive the best remedy is to close the hive as quickly as possible, when the bees themselves will quickly release her.

All over the United States there has not been more than half a crop of honey this year.

The "American Bee Journal" says:—The people who like sweets are sweet of nature; they are agreeable and pleasing; they are not changed from a sound or wholesome state; not stale; not sour; not putrescent or putrid; they are mild, soft, gentle. The people who do not like sweets are not sweet of nature. They are not agreeable nor pleasing; they have been changed from a sound and wholesome state; they are stale, sour, they are putrescent and putrid. So let's rejoice in the fact that America and England eat twice the amount of sweets of any other nations in the World. The average person of the United States and England eats more than twice as much sugar as any other person in the world. As against the American and Englishman's 80 pounds of sugar a year, the German eats but 33 pounds, the Austrian but 34 pounds, Russia 20 pounds, and Italy only 7 pounds.

A conference of beekeepers was recently held in the Technical College, Brisbane. Mr. H. L. Jones was in the chair, and there were some 29 beekeepers there from all parts of the colonies.

EXTRACTING.—In our warm weather we consider honey is all right if three parts sealed. We do not touch frames containing brood. When extracted we put in a tank holding about 500 or 600 lb., putting through a strainer in doing so. Left there for a few days before tinning or bottling off, it is as clear and fine as we could wish. In extracting the extractor is roped to a tree in the open a convenient distance from the bees. We formerly used a tent, but never think of doing so now.

ROBBERS.—Try whatever is handiest, hay, grass or weeds thrown at the entrance, then sprinkle with water, or brush with kerosene at odd places where they are trying to get in.

If extracted honey is exposed to the rays of the sun (covered by netting) for three days scum will not form after if said honey is then drawn off into retail packages.—Dickel in "American Bee Journal."

[But how about the flavor?—ED.]

The Hawaiian Islands produce about 600 tons of honey a year.

Views in Germany vary as to the value of phacelia. Some praise it as fodder for stock and for nectar, and some condemn it. A patch that I tried did not show any value for either purpose. As it is a native of California, Californians ought to tell us of its value there, and I have made several calls for such information, but without response.

The Dudley tube is a tube attached to bottom board, through which the workers escape and emerge at entrance of upper hive, joining the force in that, where the queen is. And through this tube do bees escape from the bottom hive, which contains also a comb with water. E. J. Attwater, in the "Beekeepers' Review," claims by this method there is no swarming.

Roots "A B C of Bee Culture" is published in both French and German languages.

The latest idea in bee veils is celluloid glass fronts. The trouble with them is the breath condenses on the front.

The scissors I use are by actual measurement $4\frac{1}{2}$ inches long, and have a curved point. Most of the small scissors are manufactured for ladies use, and, as a consequence, the handles are too small for the clumsy fingers of one of the masculine gender. The pair I am using are as previously stated, made especially for surgeons' use, so this difficulty is overcome, and at the same time the scissors are small and light.—G. L. Ryan in "American Bee Journal."

Paralysis is an international disease, less prevalent in cold than in hot countries.

The beekeepers of Greece and of Canada seem to have been the first to provide their hives with movable bars, under which bees suspended their combs. Della Rocca mentions these, and gives some engravings of them in his work published in 1790. In 1838, Drierzon revived this hive and improved it.—"American Bee Journal."

A field of buckwheat of only $5\frac{1}{2}$ acres, to which a yard of 30 colonies of bees had access. No other buckwheat was near, and the bees most clearly devoted their whole attention to the only available field. It was very much alive each forenoon, and the bees gathered between 750 and 800 pounds per acre therefrom, or an income from honey alone of over 40 dollars per acre. Wild buckwheat will often do as well.—"American Bee Journal."

The Editor of the "Bee Keepers Review" states in a foot note, "When I pick up a hive I step up behind it, reach down, and put a hand, or the finger ends in a hand hole on each side; raise the hive, and rest the back end of the hive against my person, and walk off with the hive. If I took the hive up by the end holes holding the side of the hive against my person, there would be a swinging of the frames at every step

We acknowledge receipt of Report of Seventh Biennial Conference of the Agricultural and Pastoral Associations of New Zealand, held at the Chambers of Commerce Room in July 30th and 31st and August 1st, 1907. Among other matters on the motion of Mr. Macfarlane, it was agreed that steps should be taken to ascertain what is the best kind of humble bee to import, in order to fertilise the clovers of the colony, and an interesting debate followed, during which it was suggested that the long red-tailed bee, *Bombus lapidarius*, and the bronze bee of the North of Ireland, should be imported. It is satisfactory to learn that the Canterbury A. and P. Association took steps to give effect to this proposal and have already received a small consignment from England.

Our own experience agrees with that of others that it is no use to unite weaklings in spring, but I have united five to one, and the united colony seemed into do no better than one left separate.

An English writer says:—I have been a bee keeper for 45 years, and yet I have not reached that point where I care nothing for protection of stings.—The best remedy we know of is to "get stung again and get used to it."

In a late number of the "Beekeepers' Review," Mr. W. L. Hutchison gives an experience in America as follows:—About the first of May I went over to Port Huron to see how matters were progressing, and was astonished to find more than half of the colonies dead. I was a little puzzled at first, as, although they were in single-walled hives, without protection, they had plenty of bees and stores, and were giving frequent flights in January when I bought them. As I carefully examined hive after hive, the conclusion was forced upon me that most of them had starved with honey in the I took. I have seen a novice take up a hive in that manner, and there was a 'clack,' 'clack,' 'clack' of the frames at every step he took.

hives. It was a peculiar combination, but one that is likely to occur in wintering bees out of doors with no protection. As they were wintering in the open air with no protection, large quantities of honey, in the centre of the hive, were consumed to keep up the heat. The warm spell in March resulted in the starting of quite a lot of brood. Then came cold that continued for nearly two weeks. The bees clustered on their brood, in the center of the hive. Honey was out of their reach without leaving the cluster, and the cold prevented their leaving the cluster. Possibly the cluster might have moved the honey (I don't know that) had it not been for the brood, but the brood they refused to desert, and the result was that they starved with honey in the hive. Most of the hives were found with a solid cluster of bees enclosing some patches of brood.

One who has watched the queen at work laying eggs can not fail to have noticed that while the egg is being deposited the abdomen is curved to no small degree, and it is easy to believe that this curving is greater in a worker than in a drone cell, and still greater in a cell only partially built out. It certainly looks like scoring one for the compression theory.

The following analysis of pollen is giving by a Mr. W. K. Morrison in the "American Bee Journal." How many bee keepers will understand it? 1. Albumen—7 per cent.; 2. Peetic acid—5 per cent.; 3. Grape sugar—5 per cent.; 4. Butyric acid—5 per cent.; 5. Myricene—5 per cent.; 6. Palmatin acid—5 per cent.; 7. Stearine acid—5 per cent.; 8. Oleic acid—5 per cent.; 9. Olyckxid; 10. Anthosmin; 11. Hyppuric acid; 12. Cerithin 13. Pollenin; 14. Cellulose; 15. Erietholin;

The bee and honey business has reached an extent in Southern California that is little realized. The report of last year made by the Los Angeles County Statistician, gives the number of colonies

of bees as 40,000, and their value as 200,000 dols.; and the amount of beeswax marketed as 9,000 pounds, with a value of 2050 dols.

We acknowledge receipt of photo of certificate and gold medal obtained by Mr. H. J. Gardiner at the New Zealand International Exhibition, 1906-7, Home Industries Section, for liquid honey. It includes photos of three silver and one gold medal, also certificate, together with the sender's photograph. These were all the medals awarded for honey in the home industry section of the exhibition. Mr. Gardiner thinks Australians should be proud of his getting these honors, as he is an Australian.

Prevention of Swarming.

E. F. Atwater gives in the "Beekeeper's Review," the Rauchfuss or Aikin plan of preventing swarming, which Mr. Rauchfuss says will give more honey than any other plan—at least for arid belt conditions—the chief fault that Mr. Atwater finds with the plan being that sometimes a colony is left hopelessly queenless by the failure of the virgin to return safely from her wedding trip. He says :

Put most of the brood in the lower story of the hive, on this a queen excluder, on this a second story, with one frame of bees, brood and the queen, the balance of the combs empty or containing some honey.

Brood-rearing will leap ahead in this upper story, receiving the heat from the mass of brood and bees below. The bees can't swarm, as the queen cannot pass the excluder. Nine or 10 days later, set the upper story containing queen, bees and new brood, off to a new stand. The hive on the old stand now contains only sealed brood. Destroy the queen-cells, if any, give a ripe queen-cell, or run in a virgin queen, and put on the supers. The bees will not swarm, as they have no eggs or larvæ from which to start queen-cells.

As soon as the young queen begins to lay, the honey will go up into the supers in a rush. For some conditions the method may be better than forced swarming as usually practised; for the hatching brood reinforces the field force for about 10 or 12 days after the old queen and her hive of new brood is removed to a new stand. —"American Bee Journal."

DAIRYING.

Starting without Capital.

Some exceedingly instructive particulars are forwarded to "The Leader" by one of its old friends, Mr. W. H. Potts, now principal of the Hawkesbury College, concerning the career of a successful New South Wales farmer, Mr. T. C. Worboys. "For many years," Mr. Potts writes, "Mr. Worboys has been the practical examiner in agriculture at the college, and every diploma student will remember the searching investigation to which he was subjected whilst undergoing the interview. All who came in contact with him readily recognised the almost inexhaustable fund of knowledge based upon experience, and were thankful for the kindly advice and sympathetic interest Mr. Worboys exhibited. Here was no theorist, but one who had faced the task of land settlement with unflinching courage and from the wilderness had hewn out a home and a living. Tried in the balance, he had not been found wanting, and he stands to-day as an example to those who, with far greater opportunities, are confronted with the task of getting their living from the land." Though Mr. Worboys has worthily earned his retirement from actual farming, he continues to give the benefit of his experience as examiner at the college, and as the record of his life work cannot fail to have an inspiring effect we cannot do better than give it in his own words.

As I have just retired from the occupation of farming after being engaged in that pursuit for thirty-six years, I

thought it might be of some interest and benefit to those who may be about settling upon the land, or who have already done so, to give a few practical hints, and the results of the last twenty years' labors. Before that time I did not take the trouble to keep accurate accounts of receipts and expenditure, but since then I have; but before giving the figures I will just relate the way I took up the land. In the year 1863 I took up 100 acres of land by selection before survey under the Robertson Land Act. I did not have much capital—only just sufficient to pay the first deposit, 5 per cent., and having to make the improvements necessary to the value of £1 per acre in the first three years. I had neither horses nor implements; the land was heavily timbered with white and blue gum, such as you could not burn, so I will leave you to judge what an uphill game it was for the first few years.

A WORKING MAN'S CAPITAL.

But perhaps it would be of interest to explain how it is possible to clear land without either capital or implements. A working man has the capital in himself. He can build a comfortable hut for himself. He can grub and cut up a few acres, and get it ready for drawing off. He can then get a man and team to draw it off, and plough it up. He can return the labor, giving three days' work for one day for the man and his team. That is how I got my work done at the start until the land began to produce sufficient, so that I could gradually get my own horses and implements, which took from five to seven years. Of course there were a few months in each year that I used to take contracts to clear land, sink wells, build huts (or mud houses) for those who had a little capital, which used to supply me with sufficient cash whilst I was working on my own land. By the time I had 15 acres cleared, and got the returns from it, I could see that it would well repay for all labor expended.

NO LUXURIES ALLOWED.

I used to smoke and drink a little those days which used to cost me about 5/- per week, but making a calculation what that 5/- per week would do if spent in clearing land, the cost of which was about £4 per acre to get it ready for the plough, that meant the 5/- per week would pay for clearing three acres more than I was already doing. That three acres would bring in on an average of about £2 per acre net, so I just run that out for twenty years, and the result was marvellous. It quite convinced me that it was a good investment, so I decided to do without the little drink and tobacco, and put every shilling into the land I could afford (which I am truly thankful I did, as it worked out just in accordance with the calculations I made to allow me to retire when I was 60 years old). By this time I began to see that the 100 acres I had selected were not sufficient to make a good farm, and all the land near was taken up, so the only chance to enlarge the area was to buy someone out. In the year 1875 one of my neighbors, who had selected alongside of me, and took up 136 acres, found that his area was too small for him, as his family was growing up, so offered to sell his portion to me, or to buy mine. I was not inclined to sell my portion; but I hadn't any money even up to this time as it took all I could get to clear the land and get the necessary tools and machinery, and to make the improvements needful. But I knew it would pay well to buy it if the money could only be got. Borrowing money was not a very easy matter in those days, as free-selected property was not very good security. However, after laying the matter before the manager of the bank, and showing him it would pay well to buy it, he advanced me the £400 for the purchase, and charged 10 per cent. interest. In four years the area paid it all back, and gave me a good return besides. That completed my present 236 acres.

PLOUGHING AND FERTILISING.

From that I began to keep my accounts more accurately, to see what the land could really produce under fair treatment. I have not used a large quantity of artificial manures, but I have saved and used all the yard manures I could, and I have tried a variety of artificial manures as experiments, and in sufficient quantities to know it will pay to use them if the proper sorts are applied and in sufficient quantities. No doubt a great deal of study is required to get the right kind of manures suitable to the various soils and the various crops required to be grown. The time has arrived in the history of the colony when a great deal more attention will have to be given to artificial manuring than hitherto has been done especially in the older settled districts, if farming is to be made successful. Of course there are many other things which tend to make farming successful—diligence, perseverance and economy. All must put their hands to, and see that nothing goes to waste. All the manure from the horses and cattle about the place should be collected for the manure heap (or shed), which will well repay the trouble taken, and everything must be done in its proper time and season.

As soon as the crops are off, plough up the land at once, or run the cultivator through it, as this will stop all weeds and rubbish from growing, and put the farmer in a position to sow, or otherwise deal with the land when the proper time comes for sowing, irrespective of the weather. A great many farmers never plough until they want to sow, and if the weather is a little unfavorable and the ground hard, they have to wait for the rain, with the result that often the best of the season is gone, and they get behind, not only in the seed time, but in the returns as well, because the late crops as a rule are never so profitable as the early sown crops. The months of April and May are the two best months for sowing wheat, oats, barley or peas.

If hay crops are wanted, the month of April is the best; if grain is wanted, the month of May in general gives the best, both in quantity and quality.

HAVE A PLAN.

A rather important thing in starting farming is to make a rough plan of the place, and lay it out as you want it to be, and then work according to the plan. It will save a great deal of time and trouble, as one is most sure to put things in the wrong place, so they have to be removed if you have no plan to work by. A good, dry, healthy place should be selected for the homestead, and as central as possible, with good sized yard a little distance from the house, with stables, cow sheds and other buildings needful; machine shed and granary built separate and in a clear space a little distance from the house and yards, while the stack yards should be arranged as not to have too much stuff in the one place in case of fire. A few ornamental trees about the house and yards will answer for two purposes—shelter in winter, and shade in summer, as well as looking nice. A few live hedges about the homestead also add to the appearance.

FINANCIAL STATEMENT.

Return of produce from the 236 acres, not including eggs or butter or live stock or anything consumed on the place, but actual produce sold and delivered on trucks, and returns received, as follow:—
 1879, £497/8/1; 1880, £415/7/4; 1881, £524/14/6; 1882, £1210/13/-; 1883, £906/5/1; 1884, £438/11/1; 1885, £496/19/9; 1886, £549/12/7; 1887, £349/1/5; 1888, £412/5/8; 1889, £738/14/8; 1890, £475/15/11; 1891, £718/12/2; 1892, £570/11/2; 1893, £460/1/8; 1894, £577/10/-; 1895, £454/7/6; 1896, £623/15/3; 1897, £665/15/-; 1898, £706/4/-. Average yearly earnings, 1878 to 1888, £580/8/3; average earnings, 1888 to 1898, £599/2/8½; average expenditure, 1878 to 1898, £247/10/3; average net earnings, 1878 to 1898, £342/1/-.

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