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Food Value of Honey Compared With Other Food Stuffs.

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

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

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

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

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

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

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

It is within our knowledge that many of the so-called bodily foods work out in their assimilation injury

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

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

There are three classes of food stuffs to which I desire to direct your attention. These are honey, eggs and milk. It is remarkable that these foods are compounded for the consumption of the human race by the three great divisions of the animal kingdom, to-wit, by the insect, the bird and the mammal tribe. The bee provides the honey, the bird produces the egg, and the mammal yields to us the milk.

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

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

I should observe in this connection that the yolk of the egg when boiled has an average of 1705 calories and has an exceedingly high fuel value. It will be seen, however, that honey stands pre-eminently at the head of this list as a fuel or energy giving value. But let me say in addition to this, honey stands transcendently higher than the other two as a life giving food from the standpoint of its power of assimilation in supporting and developing the higher faculties of a human life organization. This partly arises from the fact that, while milk and eggs contain a considerable percentage of animal substance, honey is composed almost entirely of vegetable substance of a high quality, including only such exceedingly small traces of mineral substance, and that of such a quality as to contribute to its tonic value.

We do not appropriate as food the flesh of the insect, from the laboratory of whose body the honey is compounded, but we do appropriate as food the flesh of the fowl, in the laboratory of whose body the egg is compounded. We also appropriate as food the flesh of the mammal, in the laboratory of whose body the milk is compounded. Better by far for the human race, if men and women generally would eschew completely the two latter classes of food stuffs.

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

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

The average composition is as follows:

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

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

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

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

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

of alleged cases of poisoning by honey.

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

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

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

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

Regarding some cases of poisoning by honey, which occured in New Jersey and other states, it can be said that no case of poisoning by honey would be on record if some care were exercised in not placing an apiary in a locality where many of the Ericaceae abound, even though it appears to be an ideal spot otherwise, as it is well known that honey produced by bees having access to certain Ericaceae, acts as a narcoticairritant.

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

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

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

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

FUEL VALUE:

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

Sugar, (maple) 1330

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

	Calories
Apples, average	290
Apricots, average	270
Bananas, average	460
Cherries, average	365
Figs, average	380
Grapes, average	450
Oranges, average	240
Pears, average	295
Plums, average	395
Watermelons, average	140
ANIMAL FOOD	
Roast Beef, average 1620	
Round Steak, average	840
Sirloin Steak, average	875
Corned Beef, average 1271	

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

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

In justice to the up-to-date druggist, it may be stated, that but few adopt such practices as set forth in the Handbook named, and only on very rare occasions are such substitutions practiced. It is safe to say that at least in this State, there will not be found a single druggist, who does not keep a quantity of strictly pure honey in stock for dispensing purposes.

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

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

John Hardscrabble, Jr.

Forks uv Snaky Canyon, which is uv the State uv Coloraydo.

Aprile the 25th, 1905.

Mister editur:—When I got your lettar axin me to rite sum peeces fer yer Journal I sed "No; fer there is already enuff ortherdox readin, good, bad an indifferent—mostly bad an indifferent, like the time honored doc-trine that bees make a batterin-ram out uv their heds and beats the bee-bred down into the cells with their noses—to keep beekeepers bizzy readin fer a long time, but then I looked agin an saw that a whole lot uv meddelsum fellers needed skinnin fer pitchin in agin our ortherdox doc-trines, the good old time teechins, an when I thot uv the fact that the Hardscrabbles are always red-

dy to do their dooty, I sed "Yes; I will rite an do my part to defend all ortherdox teechins." So I looked up Mr. Webster's old elementery blue-backed spellin book, an put in two hours, solid time, learnin to spell them hard words so that no smart book-larned bee-keeper an no hi strung editur could critercise mi spellin. Mi dad never let his kids go to skool mutch fer he always sed that them smart book-larned fellers didn't no enuff to hitch up old Buck and Ben, our oxens, an drive to town fer a load uv bee gums without tarin things all to peeces. So I am now in the fite to help protect our good old time-honored ortherdox customs, teechins and bee-fixins. Now, yer see, mister editur, that every skool kid nowes that bees do not pack the bee bred in the cells with their noses but it had bin teeched so long that it was ortherdox an we wus all satisfied with it till that meddelsum A. C. Miller (not the doctor Miller who never did no nothin fer he sez so hiself, so that when he sez he don't no we need to always to believ him) had to go an rite an tell that bees packs down the bee bred into their cells with their mandibles, forpaws or hans, so to speek, but I'll git him when mi nife gits good an sharp. Now, mister editur, I will tell yer what I perpose to do in all the peeces I am goin to rite fer yer Journal. I am goin to tear the cuticle or epidermis off uv all who put in their in their lip agin our good old orthedox tradishuns an teechins in regard to bees, bee-fixins, etc. Some fools rites an sezs they want to provoke thought, but I am not goin to stur up no body to do any thinkin. It wont do a tall fer if yer git one to thinkin he is likely to go astray an follow arter the new fangled noshuns. No. it wont do to argue with them an archists who are goin agin orthedox doc-trines fer these doctrines always suffers by comparison. The best way to do all the smart fellers what is trying to teech sum new noshun is to skin them or ignore them like we do our perlitical affars when sum feller gits to howlin agin the trusts or any other orthedox ideas, an the more ig-norance the better fer us. When a feller gits smart an goes to talkin about the trusts robbin the peeple we just skeer everything away from him by callin him hard names, sich as anarchists and the like. We teech him that the feller what can't be happy to see his wife an children sufferin in the kold an hungry while the good orthedox peeple are livin on the fat uv the land deserves 49,000 deths, or in other words, the little shoat what can't be content to see the big fat hog layin in the slop-troft and drinkin all the slop without runnin around squeelin needs to be shot, so to speek, or words nearly to that effect. So that is the way I am goin to do all the smart fellers what is trin to git up sum new idees in our beloved persuit. I will skin him an not argue with him at all. I am not goin to argue to stir up thots. But before I begin mi work I will introduce miself to your readers. Now everybody knows Deacon Hardscrabble, his gohst what comes to see Mr. Hill an tells hin what to rite fer the American Bee Keeper. (That aint so fer the Bible sez that thar is "no Knowledge nor device in the grave" whar the good Deackon is now, but Hill has a kind o'made that doctrine—that gohst doc-trine orthedox, so we will have to let him alone fer the Babylonians stick to their ortherdox teechins like us bee-keepers do to ourn, so that all "may believe a lie and be damned," or words to that effect, so to speek. Well, John Hardscrabble was the son uv his father, so am I. Sum peeple sez that makes me an the Deackin unkles, but I gess that aint so. Anyhow, the

Deackon was mi grandfather. Now that yer readers knows who I am I want to give fair warnin that all must keep out uv mi way fer if the rong feller gits his cuticle skratched that will be no apologies from John Hardscrabble. He just ought to have kept out uv mi path. An no female woman need not to think she can git the last word with me fer she just can't. If she jumps into preechin sum anarchist new fangled idees agin our good old tradishuns she will git her—well, she'll hear from John Hardscrabble, that's certain. But about all our lovely female beekeepers are stickin to the good old doc-trins so that aint much danger that any uv them will git into trouble with John. Now, Mister Editur, I think it best to begin mi work with you on that man Putnam. So in mi next you fellers will git it like York an Miller give it to yer.

JOHN HARDSCRABBLE, JR.

Catalpas As Bee Forage.

As catalpas grow well and have been considerably planted in California, our readers will be interested in some statements about the tree which a California inquiry drew out from the Ohio Experiment Station through the medium ship of "Gleanings".

Dr. Frederick D. Webley of Santa Rosa, wrote in this way: "Prof. W. J. Green states that the hardy catalpa does not produce as much seed as the other varieties. The inference is that it does not produce as many flowers and therefore does not yield as much honey. Is that correct? If the hardy variety is as profitable to the beekeeper for its yield of nectar as the others, its qualities as a timber tree, producing wood that is both light and tough, make it intrinsically more valuable. What is the honey value of the other varieties—native, Japanese and foreign—and what are the distinguishing features of each? Where can seed be obtained? In Santa Rosa we have a free-flowering variety, used as a shade tree, and growing well in the streets and avenues and producing a fair amount of honey of average quality. The seeds of this variety I inclose and should be glad if you can tell me what it is."

In response to this, Mr. C. W. Waid, assistant horticulturist, writes as follows: "I know very little about the comparative methods of the different species and varieties of catalpa for honey-producing purposes. I will give, however, so far as I am acquainted with them, the characteristics of the different species.

"Catalpa speciosa, also called the Western or hardy catalpa. The tree is upright in growth, with very large leaves and an abundance of bloom, although not as free a bloomer as the C. catalpa. The individual flowers are larger and more showy than any of the other species. The speciosa blooms at Wooster from the middle to the last of June. The bark of the older trees is furrowed, somewhat like the walnut, but not so marked; the younger trees also show this characteristic to some extent. The fruit pod is from 12 to 18 inches in length and ½ inch or more in diameter. The seeds are broad and the filaments—hairy projections at ends—extend out straight.

"Catalpa catalpa, also called C. bignonoides and southern catalpa. The trees of this species are low branching, with long crooked limbs. The flowers are somewhat more profuse than on the speciosa, but not in the same proportion as the fruit. The flowers of this species apparently set a larger per cent of fruit than the speciosa.

"The pods are from 8 to 12 inches in length and less than ½ inch in diam-

eter, as a rule. The seeds are not so wide as the speciosa and the filaments are drawn toward a point at the ends.

"While there are trees that are clearly defined in all of their characteristics, as either the speciosa or the C. catalpa, there are also trees which have some of the characteristics of both. This makes the matter of identification more complex; and, because of the apparent crossing or variation in type, it is not safe to determine a variety by the seed alone, unless the characteristics be very clearly defined and are representative of one of the species.

"Catalpa ovata (Kaempferii) is a Japanese species, but has not been grown very generally in this country. The flowers have a yellowish cast, which in itself is sufficient for identification of the species. The fruit pods are very long and very slender. The seeds have the appearance of very much reduced speciosa seeds.

"The seeds which Dr. Webley sent are of the speciosa type. He should be able to determine for a certainty from the above description whether they are speciosa or not, in which case he will need no other seed."

Taught In The Public Schools.

The fact that beekeeping is now being taught in the public schools of California is not very generally known even in this State, but such is the case. California schools are always progressing in every possible way, and it is especially gratifying to note that the subject of beekeeping has now been taken up as one of the new departments of instruction.

The following, taken from the Los Angeles Times, explains itself:

Under the direction of Prof. Leslie, the supervisor, many new departments are developing along this line. The latest addition to the treasures of learning are the bee hives that have brought one of the most interesting forms of life right under the very roof of the school, and under the constant ken of the sharp eyes of the rising generation.

Prof. Leslie had to secure a change of ordinance to bring about this possibility of bees in the schoolroom, and now the city ordinance forbids the keeping of bees within the city limits, except for observation purposes in the schools, and the Board of Education has allowed money for these absorbing object lessons.

"I see you keep a bee" said a most polite little city girl who saw honey upon the table in the country. Of course this argues a degree of ignorance that a school child in Los Angeles would scorn, but there are many wondrous things about "how the little busy bee improves each shining hour" that are a sealed book to the unfortunate grown-ups who were educated years ago.

LESSONS FROM BEES

The Griffin-avenue school has a thriving colony of bees in the eighth-grade room. The hive is full to overflowing and through the glass sides can be observed all the interesting affairs of bee life. First, the pupils learn of the marvelous architecture of the bees, for the sections that are rapidly being filled with honey were shaped from material that was furnished the teacher. When new sections were added to the bee house the pupils watched the bees remove the wax from the round openings just outlined by the factory imitation hive material; they saw the construction of the many-sided cells, and they were told that the bees made their cells in this shape long before humans learned such intricate architecture.

The hive is placed right beside a

window, and the bees make their entrances and exits through an open space where the window is raised a little. Not a bee can get into the room, but they are all free to wander afar to Eastlake Park and other near-by bee pastures.

The children at the Griffin-avenue school can point out the drones, the workers, and even the baby bees, and twice they have seen the queen with her long body and distinguished appearance, and they know just what process has been gone through to make "her bee majesty" different from the rest.

The observation hive which can be seen above the other in the accompanying picture, is for the purpose of containing a section from the main hive. It is entirely of glass and can be shut up and carried around from one school to another.

Prof. Leslie is trying to get permission to install an observation bee hive in one of the public parks within easy range, where the children may go to see the bees at any time. A wonderful show hive which will afford the closest inspection is soon to be placed in the High School building. The pupils of schools not supplied with hives are to be sent to other schools to study bee life, and lessons on bees will soon be added to the course of study.

Bulletin On Beekeeping.

The revised edition of the Farmers' Bulletin .No. 59, has been issued by the Department of Agriculture, under the direction of Frank Benton, who is in charge of apicultural investigations conducted by the government through the Department of Agriculture. There is considerable new and interesting matter in the new and revised edition of "Beekeeping," from which we quote these paragraphs:

On Overstocking.

The danger of overstocking a given locality is very frequently exaggerated. Each range, it is self-evident, has a limit. The writer is, however, fully convinced, after long experience in numerous localities and under the most varied circumstances, that three or four times as many colonies as are commonly considered sufficient to stock a given range may usually be kept with a relative degree of profit. But to secure such results sufficient care and close observation have too frequently not been given in the selection of bees adapted to the locality and conditions. A more frequent failure has been lack of proper attention to the individual colonies, particularly as to the age and character of the queens in each. The space given for brood rearing is often too small, and frequently no care is given to secure the proper amount of brood in time to insure a population ready for each harvest. Attention to these points would enable great numbers of beekeepers who now regard 50 to 100 colonies as fully stocking their range to reach several hundreds in a single apiary, with slight or no diminution in the average yield per colony.

Shaken or Brushed Swarms.

The practice of shaking or brushing bees from the combs of populous colonies into new hives to form artificial or forced swarms has been practiced for many years, to a limited extent, in this country, and more largely abroad. As early, at least, as 1872 the late C. J. H. Gravenhorst, the editor of Die Illustrierte Bienenzeitung, author of Der Praktische Imker, and inventor of the Bogenstuelper hive, made artificial swarms in this manner. His articles led the author to experiment in this line and finally to settle upon the plan of placing colonies designed for honey production in pairs in the apiary and, after having brought them up to a suitable strength, shaking or brushing mots of the bees of the two into

a third hive at the approach of the main honey flow, one queen being allowed to enter the new hive with the shaken swarm. The latter is to be placed on the old stand midway in position between the spots previously occupied by the parent colonies, these having been removed some distance, to be managed thereafter as colonies that have swarmed. The newly shaken swarm is to receive comb-foundation starters in the frames and within a day or two surplus receptacles for honey. In case, however, drawn combs be used in the super, there had better be one or two frames in the brood apartment partly filled with completed comb to hold the first pollen collected. The shaking or brushing should be done toward the latter part of the day and during a time when new honey is coming in, or in the absence of the latter liberal feeding should precede the shaking and be kept up until the start of the honey flow. The shaken swarm is thus brought into quite the same condition as usually obtains in the case of a natural swarm. It is able to send out a strong gathering force at once and will store honey rapidly. The increase of 50 per cent is as large as is consistent with the securing of the best honey yield.

Reference has already been made to the relative gentleness of the various races, and since the gentler types are themselves excellent honey gatherers, and the particular advantages to be derived from some of the more energetic races which do not happen to be so mild in temperament are not likely to be secured by the beginner who is unfamiliar with the most approved methods of manipulation of such bees, it is strongly recommended that only the gentle ones be at first adopted—either Caucasians, Carniolans, or Italians. Should full colonies of these not be obtainable near home, colonies of ordinary bees may be changed by replacing their queens with queens of the desired race, the latter having been procured in small boxes by mail. If possible the introduction had better be made by an expert, although in general, by following the instructions which accompany the new queen, success will also be attained by the beginner.

A brief summary of the leading traits of the various races now in this country will be of use in guiding the purchaser, as well as instructive to him for reference.

Caucasians are natives of that portion of Russia lying between the Black and Caspian seas, are exceedingly gentle, good workers, good defenders of their hives, prolific, build many queen cells, and swarm often if confined to small hives. The workers are dark leaden gray in their general color, and present quite a ringed appearance because of the alternation of this dark color with the lighter fuzz which edges the segment of the abdomen. They also show frequently one to two yellow, or leather-colored, bands, are somewhat smaller bodied than Italians or Carniolans, have good wing-expanse, and hence are nimble flyers. The drones are rather small and quite dark in color; queens not large, and vary in color from a coppery-yellow to a dark bronze.

Carniolans are much larger bodied and somewhat lighter gray in color than the Caucasians, but show likewise in many instances one or two rusty or dark-red bands. Their great hardiness and excellent wing power enable them to fly freely in much cooler weather than some other races stand, and to regain their hive entrances under adverse conditions. They are prolific, active, and good honey-gatherers, producing combs of snowy whiteness. As in the case of the Caucasians, their prolificness causes them to fill small hives to overflowing with bees, and this naturally results in numerous swarms. It is therefore advisable to use hives containing ten to twelve frames in the

brood chamber. The nature of the Carniolans is essentially a quiet one, so that upon the approach of cold weather they settle down in a very compact and extremely quiet cluster, a condition which contributes in no small degree to their excellent wintering qualities. The drones are the largest of all drones of this species, and are covered with a thick coat of gray fuzz. The queens vary from a light color to a very dark leather color, the typical queen being, however, dark bronze, large, well-rounded, strong and active.

Italians, the first of the foreign races to be introduced into this country, are much more widely known, and have with reason found great favor, since they are industrious, good defenders of their hives, and excellent honey-gatherers, as well as handsome in appearance, being usually marked with three yellow bands across the anterior portions of the abdomen. The blood has become so disseminated through the apiaries of the country that many hybrid bees having but one to two yellow bands are counted as Italians. Strains of Italians pure in blood have been bred by selection in this country until the three yellow bands have become so wide as to be nearly or quite joined, and in some instances nearly the whole abdomen is yellow. In general, however, as regards gathering powers it does not seem that any improvement has been made by this selection, the dark or leather-colored Italians proving, all in all, more vigorous, gentle, and better honey-gatherers, while as regards wintering they are also superior. It must be acknowledged, however, that the Italian race is slightly inferior in wintering qualities to all of the others which have been generally introduced into America.

Cyprians, from the island of Cyprus, may be taken as a general type with which to compare other eastern races. They are small-bodied, more slender, in fact, than any of the European races of bees. The abdomen is more pointed and shows, when the bees are purely bred, three light-colored bands on the upper surface, and considerable yellow on the under side. Between the wing attachments on the thorax is a little prominence, shaped like a half-moon, which is usually quite plainly yellow in color. The queens are small-bodied, yellow in color, with more or less black at the tip of the abdomen. The drones have a heavy coat of fuzz on the thorax, and the abdomen presents a mottled yellow appearance, being often highly yellow. Cyprians possess longer tongues and greater wing-power than other races. This, combined with great prolificness and most remarkable activity, renders them the best of honey-gatherers. In temper, however, they may be regarded as rather aggressive, rendering their management by any who are not experts extremely difficult. This feature may, however, be largely overcome by crossing the queens of this race with the drones of very gentle types. In this manner bees are produced that are readily amenable to smoke and ordinary methods in manipulation, combined with the excellent honey-gathering powers and prolificness of the eastern races.

Cyprio-Carniolans and Cyprio-Caucasians.—The author conceived the idea in the early eighties that by crossing the Cyprian and Carniolan races a type might be developed that would combine the excellent traits of both of these. The first matings of Cyprians and Carniolans were made by him in 1883 in Carniola itself, thus insuring positively the fecundation of the Cyprian queens by Carnolian drones. Bees combining the blood of the two races in various proportions have since been tested for years in comparison with all other known races, with the result that the cross mentioned above has been found to exceed all of the pure races in honey-gathering powers, owing undoubtedly to the combination of great energy, hardiness, prolificness, and wing-power, as well as greater length of

tongue—a fact established by actual measurements. Similar results, with even greater gentleness, may be expected from the cross obtained between Cyprian queens and Caucasian drones.

Syrian and Palestine or "Holy Land" Bees.—What has been said of Cyprians may be taken to apply in a general sense to Syrian and Palestine bees, except that in these the good qualities are slightly less prominent, while some of the bad ones of the Cyprians are accentuated. No separate description of these is, therefore, particularly necessary in this place.

German, Common Black, or Brown Bees.—The bees commonly found wild, and cultivated to a greater or less extent, in this country, and known under the above name, are probably derived from early introduction from the Old World. In comparison with the races above enumerated, they may be said to be inferior, since they possess the least energy in honey collecting, are less prolific, and not as good defenders of their hives. Under favorable conditions, however, as regards pasturage they may be relied upon for excellent results. They are, however, spiteful under manipulation, and have the disagreeable habit of running from the combs and dropping in bunches on the ground, likewise of flying from the hive entrance and attacking the passer-by. They are more easily discouraged than other bees during slack times as regards honey production, and this is doubtless the main reason for their generally inferior economic value.

California's Coming Honey Crop.

California, and especially the southern part of the state, will have an unusually good season this year, in the matter of a honey crop. Prof. A. J. Cook, in a recent issue of the California Cultivator, has this to say of the prospect:

In all my eleven years in southern California I have never seen such a profusion of bloom as decks our fields, hillsides and canyons at the present time. Not only are the flowers very abundant but the plants are very large and vigorous.. The ball, or black sage, is already in full bloom, is swarming with bees in the canyons and along the mesas, while I have never seen such a splendid show of white sage as now covers the bush between Claremont and the mountains. These plants are just coming into bloom. Our great rainfall almost warrants the surety of a good honey crop. Yet warmth and absence of winds are also very helpful. The warm days early last week, together with the great show of flowers and vigorous plants, were just the ideal for a honey season. A beekeeping friend at Redlands keeps a colony of bees on the scales and has done so for years that he may know just what is being gathered by them. He writes me that the record early this week was the best he ever had. One day the scales showed an increase of twenty-two pounds and the following day of twenty-four pounds. When we remember that the white sage period has not yet dawned and the black sage is yet scarcely in its prime, and when we remember further the excedingly long period of bloom of these plants, we are led to congratulate the beekeeper on the splendid prospect before him.

There are two other sages common in southern California—especially common this year—which also are most admirable honey plants. These are species of Salvia. One of them is the thistle Salvia, Salvia Carduacea. It is a wonderfully beautiful flower. I have often wondered that it was not cultivated all over the world as one of the finest of our ornamental plants. The bilablate flowers are very large and of a delicate lavender color. They form a large ball and what is very interesting, the stem passes right through this ball and gives rise to a second, often a third, and very rarely to a fourth and fifth of these lovely

balls of flowers. The foliage looks like that of the thistle, and hence the scientific name. Like many of our California plants, the foliage is whitish and thus is a good companion of the white sage. The other species, Salvia Columbariae, has the same habit as the other, though the flowers are bright blue and the balls less conspicuous. These last, however, are much more common and probably contribute much more to the bees. We would almost know that the sages—family Lablatae—would be good honey plants from their very irregularity. These irregular flowers are so fashioned as to secure the more certain cross polination of the plants. Thus these irregularities are certain signs of insect visits and thus of nectar secretion.

The following press dispatch, taken in connection with the above, confirms the assertion that beekeepers will be busy in California this year with a long and abundant harvest:

ORANGE, CAL., May 25.—Beemen are rejoicing over the rich yield of honey promised this season. The work of extracting is now in full swing. W. W. Perkins, of the El Modena rose gardens, has a small lot of bees which he kept in the valley near the blossoming fruit trees, and has succeeded in taking out over a ton of honey. Charles Baker started to extract on Tuesday and will have heavy returns. Others report the most prosperous year for this enterprise known to this section.

EDITORIAL NOTES

We note that Arthur C. Miller is now the associate editor of the American Bee Keeper, published at Fort Pierce, Florida. Mr. Miller is an authority on bees and beekeeping, and we shall expect to see him do some splendid work in his new capacity. The American Bee Keeper is already a splendid publication, and if there is any chance for it, it will be made still better. We congratulate the American Bee Keeper on securing so valuable an addition to its staff. Harry Hill, the editor, has worked hard for several years to build up that paper, and that he has made a success of his undertaking cannot be questioned.

California should have one of the largest State Associations in America, and will have if only the persons most interested will take the matter up. This publication is ready to advocate the cause with all the power it posseses, and in fact we are anxious to take hold of the matter of extending the present State organization into new territory. We are not in favor of a commercial organization for bee men, but we do favor an organization that will provide for the betterment of conditions for beekeepers in moral and social ways. An organization where men interested in a common pursuit can meet together and discuss methods and means of doing certain work in new and better ways will not be amiss in any country, and we are, as we have said before, ready to take up the matter and help make the California State Association one of the largest and best State organizations in the United

States. We shall expect to hear from those especially interested in this affair at an early date, and, if possible, will publish the correspondence in the next issue.

The following is a sample of the kind of letters we receive by nearly every mail, and is a fair indication that the circulation of the Western Bee Journal is increasing.

Santa Paula, Cal., May 15, 1905.
P. F. Adelsbach,
Kingsburg, Cal.

Dear Sir:—Enclosed find money order for $1, to pay for my subscription to the Western Bee Journal for one year. The little book gives good information and is worth the money. Yours truly,

J. G. LINEBARGER.

We made some mention in our last issue of the fact that more beekeepers in the west should take it upon themselves to write for the bee journals. It is a regrettable fact that nearly all the writers on bee topics are residents on the other side of the Rockies, when in fact some of the largest and most extensive apiaries are managed by men in the west. There are many things that can be had in the matters of laws, etc., that would be of immense benefit to western beekeepers, if they would only take it upon themselves to present the importance and the merits of the beekeeping industry to the public in the way of writing articles bearing on the subject. Once these articles are published in the bee journals the public press is always ready to reprint them and give wide circulation to articles of merit. We are not advocating this matter in order that we shall have the benefit of such articles, but are anxious to see these articles written, no matter where they are published.

Publishing a bee journal is not particularly a hard thing to do, but it is a hard thing to publish one that will meet with the acceptance of everybody. In getting out this publication the editor has in mind to make the best paper that he can, but in a measure he has to contend against certain things which prevail, and over which he has no control. For a number of years there has been a call for a bee journal to be published on the Pacific coast, and from the earnestness of some of these appeals we judged that there was certainly an aching void that needed filling. We have to say that we are not discouraged, or even disappointed in the support we have been given. In fact it is far greater than we expected. But the point we wish to make at this time is this: Why should not the only bee journal published in the west be the largest of all publications devoted exclusively to bee culture? The better way in which to help bring this about is to contribute articles for publication and to keep the editor "posted" on such matters as he may not otherwise come to know about. Oftentimes there are meetings of importance held of which we know nothing until the event has passed into history. Do not complain that the matter you expected does not appear in the Journal unless you have first exercised a little effort towards informing the publisher.