

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

B 24 1908

Gleanings in Bee Culture



Apiary of Jas. W. Bain, Marion, Ohio. Mr. Bain in the foreground.

Published by The A. I. Root Co., Medina, Ohio, U. S. A.

Entered at the Postoffice, Medina, Ohio, as Second-class Matter.



Vol. XXXVI

February 15, 1908

No. 4

\$500.00 ACCIDENT INSURANCE POLICY FREE!

FARMERS' INSURANCE THAT REALLY INSURES.

You may have had other chances to buy accident insurance that would protect you in elevators, on steamboats, and automobiles, but this is the first chance you have ever had to get real protection in your ordinary work. This NEW \$500.00 POLICY was secured from the North American Accident Insurance Company, of Chicago, Ill. (Surplus \$331,498.66) the largest company in America handling this class of policies, after long negotiations. It took three months to induce the company to write the special features that were required to make it valuable for rural people. By buying the policies outright in very large quantities, it is now possible to offer it FREE with this remarkable practical combination of magazines.



GLEANINGS IN BEE CULTURE, \$1.00
the bee-keepers' favorite paper,

FARM JOURNAL (five years), .75
the standard farm paper of the world,

GARDEN MAGAZINE—FARMING, 1.00
a most beautiful, practical horticultural magazine.

INSURANCE POLICY . . . 1.00
\$3.75

All for \$2.



These magazines, if paid for separately, would cost you \$3.75, but we can sell ALL THREE MAGAZINES with the NEW INSURANCE POLICY for ONLY \$2.00. This is because the three publishers have combined for a subscription campaign. If each one sent you a separate letter it would cost us just three times as much as where we offer all three together. THE SAVING GOES TO YOU.

If the policy is not wanted we can substitute any of the following: "Designer," "Housekeeper," "Ladies' World," "McCall's Magazine," "Mother's Magazine," or the Garden and Farm Almanac.

WHY SHOULD YOU HAVE THESE PAPERS?

BECAUSE GLEANINGS IN BEE CULTURE is the great paper in America devoted to bees and honey. If you have bees, or are going to get them (and everybody who lives in or near the country should have bees), you need the most reliable and latest information, and you want at the same time the simplest directions possible. You want the bee business in a nutshell, and that is what GLEANINGS will give you. For the beginner or the most expert it is equally valuable.

BECAUSE FARM JOURNAL is far and away the foremost farm-paper in the world, a boiled-down, practical, helpful, entertaining monthly, built to make the rural homes of America more happy, prosperous, and contented, and already doing it for more than 500,000 homes. For farmers, villagers, or suburbanites.

BECAUSE the most beautiful garden and horticultural publication in the world is the GARDEN MAGAZINE, full of sound sense, beautiful engravings from photographs, and fine printing. It has ten issues at 15 cents each and two at 25 cents each, per year, and the subscriber gets his money's worth twice over. It is a delightful magazine, useful, stimulating, and ornamental.

WHY SHOULD YOU HAVE THIS INSURANCE?

Because you are in danger, every moment, of an accident which may cripple you for weeks, months, or for life; because the loss of an eye, a hand, or a foot, may mean destitution for yourself and your family; because this protection, for a full year costs you nothing whatever.

WHAT THE POLICY PAYS:	
For Loss of Life.....	\$500.00
For Loss of Both Eyes, meaning entire and permanent loss of the sight of both eyes..	500.00
For Loss of Both Hands, by actual and complete severance at or above the wrist.....	500.00
For Loss of Both Feet, by actual and complete severance at or above the ankle.....	500.00
For Loss of One Hand and One Foot, by actual and complete severance at or above the wrist and ankle.....	500.00
For Loss of One Hand, by actual and complete severance at or above the wrist.....	125.00
For Loss of One Foot, by actual and complete severance at or above the ankle.....	125.00
For Loss of One Eye, meaning entire and permanent loss of the sight of one eye.....	50.00

Provided such loss shall result within thirty days from date of accident, from accidental bodily injuries, solely and independently of all other causes, and covers accidents as follows:

- Being thrown from a mower by horses.
- Being knocked down in the road by a wagon or automobile.
- Being hurt in a bicycle accident or collision.
- Being hurt while operating corn-sheller, fodder-cutter, etc.
- Being caught in a burning building, house, or barn.

- Being hurt in an elevator or any public conveyance—train, trolley, boat, etc.
- Being injured in a runaway.
- Being frozen or frostbitten.
- Being injured by robbers or burglars.

Should the Assured obtain injuries in the manner specified above, which shall not prove fatal, but which shall immediately, continuously, and wholly disable and prevent the assured from performing each and every duty pertaining to any business or occupation, the Company will pay the Assured FIVE DOLLARS PER WEEK during the time of such disablement, but not exceeding six consecutive weeks for any one accident.

NO DELAY OR EXAMINATION.

The insurance goes into effect as soon as you receive the policy and mail back the coupon attached to it. There are no dues, taxes, premiums, or assessments of any kind whatever to be paid by you. We have paid everything in full.

The three papers will begin at once, and will come to you each month till the time expires. THEN THEY WILL STOP, unless you order them renewed.

Send us \$2.00 by registered mail, or postoffice or express money-order-to-day. Money refunded to any dissatisfied subscriber. Address

GLEANINGS IN BEE CULTURE, MEDINA, O.

This Policy does not apply to persons under sixteen or over sixty-five years of age.

C. H. W. WEBER

Headquarters for

BEE SUPPLIES

**Distributor of Root's Goods
Exclusively, at Root's
Factory Prices**

GIVE ME YOUR ORDERS for the **Best Goods Made**. You will be pleased on receipt of them. You will **save money** by ordering from me. My stock is complete; in fact, I keep **every thing** the bee-keeper needs. Cincinnati is one of the best shipping-points in the Union, particularly in the South, as all freight now goes through Cincinnati. Satisfaction guaranteed. Send for descriptive catalog and price list. It will be mailed you promptly **free of charge**.

Special Discount on Early Orders

I will buy your **HONEY AND BEESWAX**. I pay **Cash on Delivery**; or if you are in **need of honey**, write for prices and state quantity wanted, and I will quote you the lowest price of any quantity wanted—in cans, barrel-lots, or car-lots—of **extracted or comb honey**. I guarantee its purity.

WANTED=Sweet Clover.

If you have **Sweet Clover**, state if yellow or white, hulled or unhulled, also quantity and lowest price.

C. H. W. WEBER

Office and Salesroom, 2146-2148 Central Ave.
Warehouse, Freeman and Central Avenue.

CINCINNATI,



OHIO

Honey Markets.

GRADING RULES FOR COMB HONEY.

FANCY.—All sections well filled, combs straight, firmly attached to all four sides, the combs unsoiled by travel-stain or otherwise; all the cells sealed except an occasional one on the outside surface of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs straight; one-eighth part of comb surface soiled, or the entire surface slightly soiled; the outside surface of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs comparatively even; one-eighth part of comb surface soiled, or the entire surface slightly soiled.

No. 2.—Three-fourths of the total surface must be filled and sealed.

No. 3.—Must weigh at least half as much as a full-weight section.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark; that is, there will be "Fancy White," "No. 1 Dark," etc.

The prices listed below are intended to represent, as nearly as possible, the average market prices at which honey and beeswax are selling at the time of the report in the city mentioned. Unless otherwise stated, this is the price at which sales are being made by commission merchants or by producers direct, to the retail merchant. When sales are made by commission merchants, the usual commission (from five to ten per cent) cartage, and freight will be deducted, and in addition there is often a charge for storage by the commission merchant. When sales are made by the producer direct to the retailer, commission and storage, and other charges, are eliminated. Sales made to wholesale houses are usually about ten per cent less than those to retail merchants.

NEW YORK.—There is but little demand for comb honey, and that for fancy grades only. While there is no overstock, there is a sufficient supply to meet all demands if not more. Off grades of white honey, dark and mixed, are neglected, and very little called for. We quote fancy white, 15; No. 1 white, 14; off grades and dark, 10 to 12, according to quality. The demand is fair for nearly all grades of extracted; but receipts are quite large, and prices are somewhat declining. We quote: White sage, 8½ to 9; light amber, 7½ to 8; dark, 6½ to 7. The market for beeswax is quite dull; very little demand, but prices are declining. We quote from 28 to 30, according to quality.

HILDRETH & SEEGELKEN,
Feb. 5. 265 Greenwich St., New York.

ZANESVILLE.—The market for honey continues to be light, though if any difference there is a slight improvement since our last report. Commission men seem to have plenty of comb in stock, especially alfalfa, and are getting from retail grocers \$4.00 to \$4.25 per case of 24 sections for fancy, or 18 to 19 cents per pound. No. 1 brings about a cent less. The demand for extracted is chiefly in glass packages for the retail trade. I pack two sizes—25 and 10 cent, getting \$2.25 and 90 cts. per dozen, respectively, from grocery and drug trade. Beeswax is moving very slowly. We could use a little good yellow at 30 cts. f. o. b. here in exchange for bee-supplies.

EDMUND W. PEIRCE,
Feb. 5. 136 W. Main St., Zanesville, O.

PHILADELPHIA.—The honey market has been slow, both on extracted and comb honey. They are freely offered at the following prices: Fancy white comb, 15 to 16; No. 1, 14 to 15; amber, 12 to 14; extracted white, in cans, 8½ to 9; amber, 7 to 8. Beeswax, 30. We are producers of honey, and do not handle on commission.

W. A. SELSER,
Feb. 8. 10 Vine St., Philadelphia.

INDIANAPOLIS.—Demand for best grade of extracted honey is good, while comb honey is meeting with slow sales. Very little honey is being offered by producers, and jobbers are carrying a very limited stock. Bottled goods in groceries find slow sales, which can be attributed to dull times; but there is another reason—many bottlers are making the mistake of putting out inferior goods. Jobbers are offering the following prices, delivered here: No. 1 and fancy comb, 16 to 17; extracted white clover, 9 to 10; amber in barrels, slow at 6 to 6½. Beeswax, 28 cents cash or 30 cents in exchange for merchandise. WALTER S. POWDER,
Feb. 5. Indianapolis, Ind.

SAN FRANCISCO.—Practically all the last crop of honey has now moved out of the hands of producers, and stocks held here are slightly greater than last month. The supply, however, is still small, and prices are firmly held, though the movement has not increased to any extent. Water-white, comb, 16 to 17; white, 15; water-white, extracted, 8 to 8½; light amber, 7 to 7½; dark amber, 6½ to 6¾.—*Pacific Rural Press.*

Feb. 1.

BUFFALO.—Demand for all kinds of honey is fair at steady prices. No. 1 to fancy white comb, 16 to 17; No. 2 white comb, 13 to 15; No. 1 buckwheat, comb, 11 to 12½; No. 2 buckwheat, comb, 10 to 11; white clover, extracted, 9 to 11; amber, extracted, 8 to 8½; dark, extracted, 7 to 8; tumbler, 90 to \$1.00 per doz. Beeswax, 25 to 28. W. C. TOWNSEND,
Jan. 28. Buffalo, N. Y.

CINCINNATI.—The market on comb honey is exceedingly slow. Prices are no inducement to force sales. No. 1 white comb honey is selling slow, retail, 16. The market on extracted for manufacturing purposes is slow, ranging from 6 to 6½ in barrels. No white clover to offer. White sage is 9½ to 10. Beeswax, fair demand, selling at 32. C. H. W. WEBER,
Feb. 4. Cincinnati, O.

HAVRE.—There is only a small trade in foreign honey at about 5 cts. per lb. at the custom-house. Wax is selling at 33.

NICE.—Local honey is selling at 10 to 12; Riviera at 11 to 13 at the custom-house; Calabria honey (season of 1906), 11 to 12; from Sfax, Mahdia, Sousse, and Monastir, in Tunis, 10; second quality slightly less.

MARSEILLES.—Wax, Madagascar, 30; Algiers, 31; Morocco, 31½; local honey, white, 8; Italian, 8.

BARCELONA.—Wax, Spanish, 30 to 32; foreign, 30 to 33; native honey, 8 to 9 for first quality.
L'Apiculture Nouvelle.

BERLIN.—Honey is retailed here at 35 cts. per lb.

THE BUSY BEE-MEN.

It won't be long before the bees
Will need some new abodes.
THE BUSY BEE-MEN sell THE HIVE
MUTH SPECIAL by the loads.

It can't be beat, and costs the same
As any 'in the ring.'
But take a look into our book—
You'll say, "That's JUST THE THING."

Send for our free catalog, and see our MUTH SPECIAL DOVETAILED HIVE illustrated. You can't believe it unless you see it.

THE FRED W. MUTH CO.,

51 WALNUT STREET.

The Busy Bee-Men.

CINCINNATI, OHIO.

Send for our prices on table honey. We have the finest.

**Extracted
Honey
Wanted**

We are always in the market.

If you have any to sell, mail small average sample to

**NATIONAL
BISCUIT COMPANY**
Purchasing Department,
205 LaSalle St., Chicago, Illinois.

**WESTERN
Bee-keepers**

.. will ..
SAVE TIME AND FREIGHT

by ordering **ROOT'S GOODS**
from Des Moines, Iowa.

Complete **NEW STOCK** now on hand. Our stock includes a full line of Danzenbaker hives and all other up-to-date goods.

Remember we sell at Root's factory prices, and offer liberal discounts now. Estimates cheerfully given. Send us a list of your wants, and get our net prices by letter.

Our 1908 catalog is now ready to mail. Write for it to-day. Address

JOS. NYSEWANDER
565-7.W.7th St., Des Moines, Ia.

WE WILL BUY AND SELL

HONEY

of the different grades and kinds.

If you have any to dispose of, or if you intend to buy, correspond with us.

We are always in the market for **WAX** at highest market prices.

HILDRETH & SEGELKEN,
265-267 Greenwich St. 82-86 Murray St.
NEW YORK.

**NEW GOODS!
BIG STOCK!**

New Warehouse Root's Goods
Prompt Shipment Low Freight

**EVERYTHING
FOR THE BEE-KEEPER AT
SAVANNAH, GA.**

We are now prepared to furnish promptly a full line of supplies; choice new stock just from the factory.

Bees and Queens!

We have large apiaries of fine stock. Book your orders at once, as there will be a heavy demand this season. Catalog sent free. Correspondence solicited.

HOWKINS & RUSH
241 BULL ST. SAVANNAH, GA.

W. H. Laws says, If there is a queen-breeder who can boast of better stock let him trot out the proof. Testimonials enough to fill this book. Will give you only one. Mr. J. C. King, Washington, D. C., writes, "For two years I have had one of your queens in my apiary. Each season she has given me over 200 lbs. comb honey; last season she actually stored while other colonies starved. I have over twenty strains in my three apiaries, but yours is the best."

Now is the time to get a fine breeding queen; stock up this fall and double your crop of honey the coming season. Single queen, \$1.00; 6 for \$5.00. Extra select breeders, \$5.00. Safe arrival and satisfaction guaranteed.

W H LAWS, Beeville, Bee Co., Texas.

Established
1873.
Circulation
32,000.
72 pages.
Semi-
monthly.

Gleanings in Bee Culture

\$1 per year.
When paid
in advance:
2 years, \$1.50.
3 years, \$2.00.
5 years, \$3.00.

Devoted to Bees, Honey, and Home Interests.

Published by
THE A. I. ROOT CO., Medina, Ohio

J. T. CALVERT, Business Manager

POSTAGE IS PREPAID by the publisher for all subscriptions in the United States, Hawaiian Islands, Philippine Islands, Guam, Porto Rico, Tutuila, Samoa, Shanghai, Canal Zone, Cuba, and Mexico. Canadian postage is 30c per year. For all other countries in the Postal Union add 60 cents per year postage.

CHANGE OF ADDRESS. When a change of address is ordered, both the new and the old address must be given. The notice should be sent two weeks before the change is to take effect.

DISCONTINUANCES.—The journal is sent until orders are received for its discontinuance. We give notice just before the subscription expires, and further notice if the first is not heeded. Any subscriber whose subscription has expired, wishing his journal discontinued, will please drop us a card at once; otherwise we shall assume that he wishes his journal continued, and will pay for it soon. Any one who does not like this plan may have it stopped after the time paid for it by making his request when ordering.

HOW TO REMIT. Remittances should be sent by Draft on New York, Express-order or

Money-order, payable to order of The A. I. Root Company, Medina, Ohio. Currency should be sent by Registered Letter.

AGENTS. Representatives are wanted in every city and town in the country. A liberal commission will be paid to such as engage with us. References required.

Foreign Subscription Agents.

Foreign subscribers can save time and annoyance by placing their orders for GLEANINGS with any of the following authorized agents, at the prices shown:

PARIS, FRANCE. E. BONDONNEAU, 142 Faubourg St. Denis. *Per year, postpaid, 7½ fr.*

GOODNA, QUEENSLAND. H. L. JONES. Any Australian subscriber can order of Mr. Jones. *Per year, postpaid, 6/.*

DUNEDIN, NEW ZEALAND. ALLIANCE Box Co., 24 Castle St. *Per year, postpaid, 6/.*

\$53,700

Made by O-HI-O Cooker Agents in 1905 selling the

OHIO

combination

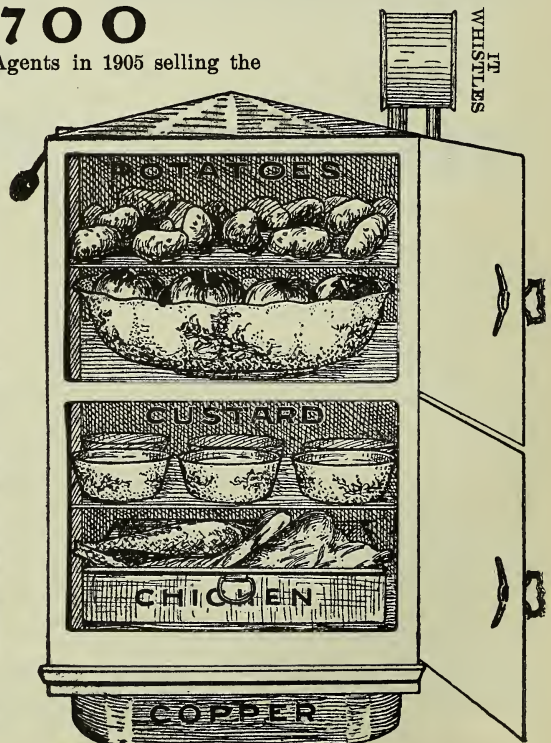
Steam Cooker-Baker.

We have many agents making \$5 to \$10 daily. Write us and we will give you names of agents near by who are making at least \$5 daily. We can easily prove that the "O-HI-O" is the best money-maker you ever heard of, and will make you more money than any thing you ever sold or are now selling. *Write us at once and we will prove it.*

Guaranteed to save 50 per cent in fuel, labor, time, and provisions. A whole meal cooked over one burner on any style stove. It assures you deliciously cooked hot meals; 80 days' trial. No intermingling of odors or tastes. Fine for use in summer cottages. A necessity every day of the year. The only healthful way to cook foods and breadstuffs.

Handsomely illustrated catalog free.

"O-HI-O" COOKER CO.
908 Jefferson Av., Toledo, O.



THE RIPENED FRUIT

If you are not a subscriber to the *Bee-keepers' Review* then it is the

Fault of the Advertising;

and I'll admit that no description of an object can quite equal an actual examination.

The *Review* started modestly, quietly put forth its roots, threw out its branches, budded and blossomed, and is now bearing

Crops of Ripened Fruit.

This is not simply a fanciful figure of speech. There are reasons for this, which lack of space forbids mentioning; but it is an actual fact that the *Review* is going ahead and "doing things" in a way that really astonishes even its editor. Yes, and a competitor like Bro. Root, during a recent visit, generously admitted that the *Review* had never

"Scintillated"

(yes, that's the word he used) as it had in the last few months.

Not as a publisher, but as one bee-keeper to another, I say you ought to take the *Review*. Of course it will do me some good, but it will do you *more*.

So sure am I that you would be delighted with the *Review* that I will make this proposition: Send me \$1.00 and I'll send you all of the back numbers from January, 1907, and put your name on the list for the rest of this year. When the back numbers come, take time to look them over carefully; and if you are not

More Than Satisfied,

if you would not rather have the *Review* keep on coming to the end of the year, than to have the dollar, just drop me a postal and I'll take your name off the list, return the dollar, and you will be welcome to keep the back numbers. I could not make this offer if I did not know how good the *Review* really is—and I want you to know it.

W. Z. HUTCHINSON, :: :: :: FLINT, MICH.

We are not selling enough books. But WE HAVE TO SELL

ALL THE BEE-BOOKS THAT ARE SOLD IN AMERICA,
and until March 1 we are Selling Them at 10 PER CENT DISCOUNT from Publishers' Prices.

And every book is perfect. We are *not offering you seconds or injured books*. Not only books, but new and renewal subscriptions to any of the bee-journals are subject to this discount. See what a saving that is. The A B C, the Root book on bees, is sold by other people for \$1.50 postpaid; by us for \$1.35. Twenty-five cents less by freight or express. Advanced Bee Culture, the finest written, the finest printed and bound, of any of the recent bee-books; the *best* book for one who is already a bee-keeper, is sold by others for \$1.00; by us for 89 cts. How to Keep Bees, by Anna B. Comstock, is the book for the suburbanite with a few colonies of bees who never expects to have a large apiary. Price the same as for Advanced Bee Culture. Either of these last books ten cents cheaper by freight or express. Because we are not selling as many of these books as we want to, we are *not only going to give* the discount above mentioned, but we will *send us a present* to the person from each State who is first to answer this advertisement with a book order any dollar bee-book in the English language which may be requested. REMEMBER, we can supply you with best quality of comb or extracted honey at fair prices, and fresh-from-the-factory ROOT BEE-SUPPLIES AT FACTORY PRICES.

G. S. CRAFFAM & BRO.,

BANGOR, MAINE.



QUEENS FOR 1908



J. E. HAND, the veteran bee-keeper and EXPERT QUEEN-BREEDER, will devote a part of his time the coming season to the rearing of CHOICE QUEENS from a superior strain of LONG-TONGUE RED-CLOVER ITALIANS that have gained a world-wide reputation for HARDINESS, GENTLENESS, AND SUPERIOR HONEY-GATHERING QUALITIES. Watch for his ad. It will open your eyes to a few points in queen-rearing that will save you dollars.

HIGHLAND BEE AND POULTRY FARM, J. E. HAND, Proprietor, BIRMINGHAM, ERIE CO., O.

Lewis Bee-supplies at Factory Prices

BEST GOODS. PROMPT SHIPMENTS. FEBRUARY DISCOUNT 3%.
Send for 1908 catalog on new supplies and fire-sale list.

ARND HONEY & BEE SUPPLY CO., H. M. Arnd, Prop.
191-193 E. Superior St., Chicago, Ill.

Successors to
York Honey & Bee Supply Company.

Gleanings in Bee Culture

E. R. ROOT,
Editor

A. I. ROOT
Editor Home Department

H. H. ROOT
Ass't Editor

Department Editors—DR. C. C. MILLER, J. A. GREEN, PROF. A. J. COOK, J. E. CRANE, LOUIS H. SCHOLL, G. M. DOOLITTLE, R. F. HOLTERMANN, "STENOG," W. K. MORRISON.

CONTENTS OF FEBRUARY 15, 1908

HONEY MARKET.....	184	Paper over Section Honey.....	208
STRAY STRAWS.....	199	Honey-dew Honey.....	209
Blossoms, Time of Forming.....	200	Bee-preserve, New.....	209
Prohibition in Chicago.....	200	GENERAL CORRESPONDENCE.....	209
EDITORIAL.....	141	Queen-rearing.....	209
Cattle vs. Bees.....	201	Sibbald Wax-press.....	210
Basswoods, Raising.....	201	Syrup, Thick vs. Thin.....	212
Bees for Japan.....	201	Swarms Choosing Location.....	213
Moths and Foul Brood.....	201	Wintering in Slightly Damp Cellar.....	214
Sweet Clover for Cattle.....	202	American Hives in Europe.....	214
Honey for Hotels.....	202, 203	Home-made Windmill.....	215
Bees and Rheumatism.....	202	Uncapping-boxes.....	217
Bottom Ventilation in Cellar.....	202	Bees in Log Gums.....	219
Adulteration Diminished.....	202	Sweet Clover.....	220
Wells System.....	203	Honey-gate, Home-made.....	221
Bees as Reflex Machines.....	203, 223	HEADS OF GRAIN.....	233
Smelter Smoke, Deadly Effects of.....	204	Trouble, Mysterious, Explained.....	233
Bees in Hawaii.....	204	Basswoods, Difficulty in Germinating.....	233
Leasing Public Land.....	205	Honey, Liquefying Slowly.....	233
CONVERSATIONS WITH DOOLITTLE.....	205	Report from Australia.....	233
Swarming, To Prevent.....	205	Five-stand Made of Slab.....	234
BEE-KEEPING IN THE SOUTHWEST.....	206	Starters Discussed.....	234
Labels on Honey.....	207	Alexander Feeder, Improved.....	234
Exhibiting Granulated Honey.....	207	Springs to Hold Entrance-blocks.....	235
FANCIE AND FALLACIES.....	208	Fall Feeding, Late.....	235
Forests, Destruction of.....	208	Law Concerning Honey in Tin.....	235

KNIVES AND SCISSORS.

If you are on the outlook for a really good pocket-knife we think that the pages of GLEANINGS will be of service to you in finding something durable and satisfactory. If you will turn to the advertisement of Maher & Grosh Co., A street, Toledo, Ohio, you will find advertised a line of cutlery goods. Do not think we advise without knowing the facts, for we sent to them for samples some time ago, and have been trying them right here in the office. The pocket-knife is just to our liking—sharp, well shaped, well bound, and yet not too heavy. We consider it a really good knife. The scissors we have are also satisfactory in every way—close-fitting and sharp. Moreover, we believe that both knife and scissors may be readily sharpened when required. We do not know for a certainty, but we believe the Maher & Grosh Co. would return the money to a dissatisfied customer who returned the goods, as they have been doing a mail-order business for years on the square-deal principle.

FINE TOOLS FOR THE GARDENER.

In nothing is American mechanical skill more clearly shown than in the designing and construction of agricultural tools. Other countries are so hopelessly far behind that they can not be considered in the race at all. We do not here allude to horse-driven machinery, but rather to hand-power appliances for the gardener and truck-grower, such as is manufactured by the Bateman Mfg. Co., of Grenloch, N. J., who turn out in wholesale fashion an immense number of beautifully constructed gardening-tools. Some of these tools will actually do better work than any person can perform by hand. For example, no man could perform the marvelously accurate work done by one of their "Iron Age" machines for distributing garden seeds. In point of fact, the work of seed-planting is rendered a pleasure instead of a drudgery, as used to be the case in this country in years gone by. The modern truck-grower can not do without these tools. They are fixtures in his business, and he would stop work rather than attempt to do without them. If you are not acquainted with the superior merits of the "Iron Age" line of tools, write for catalog.

4 PER CENT.

There is Nothing Speculative

about a savings account with The Savings Deposit Bank Company—

It is the one form of investment that does not fluctuate in value—

It is always there when you want it—

It is absolutely sound and secure—

It is the safest, most satisfactory investment your money can find.

Our booklet describes our methods and management, and explains the advantage of our simple banking-by-mail system.

WRITE FOR THE BOOKLET TO-DAY

Established 1892

A State Bank

Assets over \$700,000

THE SAVINGS DEPOSIT BANK COMPANY

MEDINA, OHIO

FIX YOUR ROOF

5c Per Square.—We will guarantee to put any old leaky, worn-out, rusty, tin, iron, steel, paper, felt or shingle roof in perfect condition, and keep it in perfect condition for 5c per square per year.

Roof-Fix The Perfect Roof Preserver, makes old, worn-out roofs new. Satisfaction guaranteed or money refunded. Our free roofing book tells all about it. Write for it today. The Anderson Manufacturing Co., Dept. 24 Elyria, Ohio.



FENCE Strongest Made

Made of High Carbon Double Strength Coiled Wire. Heavily Galvanized to prevent rust. Have no agents. Sell at factory prices on 30 days' free trial. We pay all freight. 37 heights of farm and poultry fence. Catalog Free. COILED SPRING FENCE CO. Box 191 Winchester, Indiana

DEMING Sprayers

make money for the users. Best made—solidly constructed. Not injured by chemicals.

Nineteen Eight Catalogue and "Expert Testimony" will interest you.

THE DEMING CO.,
545 Depot St., Salem, O.
Henion & Hubbell,
Agents, Chicago, Ill.

Root's Bee-supplies at Root's Prices

But f. o. b. Baltimore instead of Medina. Write for catalog L. No charge for drayage.

RAWLINGS IMPLEMENT COMPANY
9 and 11 W. Pratt St. Baltimore, Md.

SAVE EXPRESS! by ordering
SAVE FREIGHT! your supplies
SAVE TIME! in
...Boston

H. H. JEPSON,
182 Friend St. Phone Haymarket 1489-1

Poultry Experts Show How to Make Money with Poultry and Incubators.

Every farmer and farmer's wife in this country should consider the great ready cash profits of raising poultry in the easiest and most economical, time-saving way, with incubators and brooders which have for 10 years demonstrated their superiority over the hen.



Guaranteed Best Hatcher

Poultry experts are absolutely agreed that the Cyphers Incubator Company's patented machines are the world's standard. Beginners—Experts and the Agricultural Experiment Stations are using Cyphers machines successfully and recommend them.

It will pay every reader of this paper to get the latest reliable facts on the poultry subject, by writing for the Cyphers Free 212-Page Catalog (8x11 in., larger than a magazine), which is most interesting in the decision of the subject of "How to Make Money with Poultry and Incubators."

The catalog contains hundreds of illustrations, and describes the full line of Cyphers Supplies—everything for the poultry raiser. This, the biggest and best book of its kind, is free to you if you name this paper and send name and address of two acquaintances interested in poultry. Address Cyphers Incubator Company, Buffalo, New York, Boston, Chicago, Kansas City, Oakland, Cal., or London.

Poultry Magazine,



Monthly, 50 to 100 pages, its writers are the most successful Poultrymen and women in the United States. It is

The POULTRY TRIBUNE,

niceily illustrated, brimful each month of information on How to Care for Fowls and Make the Most Money with them. In fact so good you can't afford to be without it. Price, 50 cents per year. Send at once for free sample and **SPECIAL OFFER TO YOU.**

SWINE MAGAZINE

Monthly 24 to 64 pages, best writers and information how to **Make Big Money With Hogs.** It is

The NATIONAL SWINE MAGAZINE

Printed on heavy paper, well illustrated with Prize Winning Animals, Houses, Fixtures, etc. 80 cts. per year. Our Premium Proposition to Agents on these two Magazines enables you to get one or a pair or more of purebred pedigreed pigs, 4 kinds, absolutely FREE or a big Cash Commission if you choose. Write me today for samples of the two papers and full particulars.

R. R. FISHER, Publisher, Box 50, Freeport, Ill.

GREIDER'S FINE Poultry Catalogue

For 1908 is larger and better than ever. Tells all about pure-bred poultry and illustrates 60 varieties. Contains 10 beautiful chromos of leading breeds—pretty enough to frame. Tells of best Louse Killer, how to cure diseases, make money. Only 10c postpaid. Send to-day for a copy. **B. H. GREIDER, Rheems, Pa.**



MAKE MONEY IN POULTRY Others do it. You can too. Our big book "Profitable Poultry" tells how Describes largest successful poultry-farm. 45 varieties of beautiful, hardy, pure bred fowls. Quotes low prices on fowls, incubators, supplies etc. Sent for 4 cents. **Berry's Poultry Farm, Box 253, Clarinda, Ia.**

INDEX TO ADVERTISEMENTS.

Banking by Mail.	Bees and Queens.	Miscellaneous.	Potato Implement Co. 240
Savings Deposit Bank 188	Hand, J. E. 187	Allen, W. F. 244	Rawlings Imp. Co. 189
	Laws, W. H. 195	American Cor. School. 197	Ratekin's Seed House 243
Bee-smokers.	Pharr, J. W. 245	Ames Plow Co. 242	Reliance Nursery Co. 241
Danzonbaker, F. 194	Shaffer, H. 245	Anderson Mfg. Co. 189	Roesch, L. 245
		Arnd Honey Co. 187	Scarf, W. N. 243
Bee Supplies.	Buggles.	Bateman Mfg. Co. 241	Shumway, R. M. 245
Blanke & Hauk. 195	Ohio Carriage Co. 240	Burpee, W. A. 243	Snell, F. A. 245
Bondonneau, E. 192	Classified Advertisements.	Charles City Nur. Co. 242	Storrs & Harrison. 243
Buck & Wilson, back cover.	Bees and Queens. 251	Chicago House-wr. Co. 241	United Factories Co. 240
Buell, S. D. 245	Bee-keepers' Directory. 251	Coiled Spring Fence Co. 189	Williamson, C. J. 245
Falconer, W. T. 254	For Sale. 250	Conrad & Jones. 172	Poultry Supplies.
Farmer, L. J. 244	Help Wanted. 250	Deen Loom Co., back cover.	Belle City Inc. Co. 247
Graffam, G. S. 187	Honey and Wax Wanted. 251	Electric Wheel Co. 242	Berry's Poultry Farm. 189
Grainger, E., & Co. 192	Honey and Wax for Sale. 251	Farm and Stock. 245	Brenner, J. J. 245
Hilton, Geo. E. 194	Real Estate for Bee-keepers. 250	Flansburg & Potter. 244	Cycle Hatcher Co. 246
Howkins & Rush. 185	Situations Wanted. 250	Fouts & Hunter, front cover.	Cyphers Inc. Co. 189
Hunt & Son, M. H. 192	Poultry Offers. 251	Fruit Grower. 244	Des Moines Inc. Co. 247
Jenkins, J. M. 194	Wants and Exchange. 251	Gardner Nursery Co. 243	Fisher, R. R. 189
Jepson, H. H. 189	Comb Foundation.	German Nurseries. 245	Gem Incubator Co. 247
Minnesota Bee Supply Co. 193	Dadant & Sons. 254	Gordon, Van Tine Co., back cover.	Greider, B. H. 189
Nebel, J. 193	Dittmer, Gus. 194	Green's Nursery Co. 196	Johnson, M. M. 247
Nysegander, Jos. 185	Household Specialties.	Hildreth & Segelken. 195	Mann, F. W. 245
Pouder, Walter S. 196	Best Light Co. 240	Hill, D. 244	Miller, J. W., Co. 246
Prothero, Frank W. 195	Ohio Cooker Co. 186	Hotel Cumberland. 240	Model Incubator Co. 247
Reeves, A. H. 194	Machinery	Hough, F. H. 241	Neubert, R. F. 245
Root Co., Syracuse. 193	Allen, S. L. 241	Indiana Burial Vault Co. 253	Racine Hatcher Co. 246
Root Co., St. Paul. 195	Barnes, W. F. & J. 245	Kalamazoo Stove Co. 241	Reliable Incubator Co. 246
Schmidt, R. H. 245	Deming Co. 189	Kellogg, R. M. 244	Stahl, G. H. 247
Stringham, I. J. 194	Iwan Brotners. 242	Lowe Brothers. 242	Sure Hatch Inc. Co. 246
Texas Seed and Floral Co. 195		Mitchell & Son. 245	United Factories Co. 246
Toepperwein, U. 239		Mugler Engraving Co. 253	Wisconsin Inc. Co. 246
Weber, C. H. W. 183		Myers, F. E. 242	Publishers, Bee-Journal
Woodman, A. G. 245		National Biscuit Co. 185	American Bee-keeper. 254
		National Fur Co. 196	Falconer Mfg. Co., back cover.
			Hutchinson, W. Z. 187
			York & Co., Geo. W. 243

Catalogs Received.

Park's Floral Guide, La Park, Pa. A small catalog, but very interesting to the amateur flower-fancier.

Crine's Seed Catalog. This is an excellent list of gardeners' and truck-growers' seeds. R. V. Crine, Morganville, Monmouth Co., N. J.

Crawford's Catalog of Strawberry-plants. This is the annual announcement of celebrated strawberry-growers, the M. Crawford Co., Cuyahoga Falls, O.

Spring catalog of Kevitt's plant-farm, Athenia, N. J. Mainly devoted to strawberries. Well worth sending for by those interested.

Charles City Nursery and Orchard Co. A catalog of fruit-trees, etc.—an excellent catalog of trees adapted to the central West. Address, Charles City, Iowa.

Annual catalog of the Texas Seed and Floral Co., Dallas, Texas—seeds, garden, and poultry supplies. One of the most important catalogs issued in the Southwest.

Olds' Seed Catalog—all sorts of farm seeds. L. L. Olds Seed Co., Clinton, Wis. This is just the thing for farmers in the blizzard States and the Canadian Northwest.

Ratekin's Seed-book, issued by Ratekin's Seed-house, Shenandoah, Iowa. Farmers in the prairie States can not very well overlook Ratekin when ordering seeds.

Three catalogs of D. Hill, evergreen specialist, Dundee, Ill. Many of our readers do not realize the splendid work being done by Mr. Hill. Get his catalog and see for yourself.

The 24th Annual Catalog of Sterling Seeds, by Northrup, King & Co., seedsmen, Minneapolis, Minnesota. This is a fine catalog, which is fully equal to those turned out by any Eastern firm of seed-dealers.

The Storrs & Harrison Painesville Nurseries, Painesville, Ohio. A full general catalog of seeds, rose-bushes, plants, ornamentals, and fruit-trees. This firm is one of the most reliable and satisfactory in the country.

Aineer Bros., Rockford, Ill.; general seed catalog. A good list for those living in central States.

Andorra Nurseries, Chestnut Hill, Philadelphia, Pa., price list of trees, shrubs, roses, and fruit-trees. One of the finest catalogs of trees issued anywhere.

Carl Sonderegger, Beatrice, Neb.; catalog of the German nurseries and seed-house. All farmers in the Northwest should possess themselves of a copy. Burpee's Farm Annual for 1908; general catalog of farm and garden seeds. No market-gardener should overlook sending for this fine catalog.

James J. H. Gregory & Son, Marblehead, Mass.; vegetable and flower seeds for 1908. Always to the front with fine pumpkin, squash, melon, and cucumber seeds.

C. C. Abel & Co., 116 Broad St., New York; trade catalog of nursery trees; Pierre Sebire & Son, Ussy, France. Very interesting to those who grow trees for sale.

Geraniums, R. Vincent, Jr., & Son Co., White Marsh, Md., beautiful catalog devoted to geraniums only. If you are a lover of these flowers, this list will interest you.

Seed Catalog of N. L. Willet Seed Co., Augusta, Ga. This is a very complete list of seeds adapted to Southern conditions. Many of the items are not listed by Northern seedsmen.

Everything for the Garden. A very handsome catalog issued by Peter Henderson & Co., 35 Corlandt St., New York. The Henderson catalog always confers a luster on a great name.

Maule's Seed-book. A large catalog of seeds by Wm. Henry Maule, Philadelphia, Pa. This firm has always provided a large and handsome catalog to its patrons, and this year is no exception.

Vaughan's Seed-store Catalog, of 84 and 86 Randolph St., Chicago, Ill. This is a large catalog from one of the world's most extensive seedsmen—a very complete list for farmers and gardeners.

Stokes' Standard Seeds. This is the full title of the annual catalog of Walter P. Stokes, 219 Market St., Philadelphia, whose name is familiar to all market-gardeners and florists in the Eastern, Central, and Southern States.

MR. ROBEY'S STATEMENT.

When you wish to get the best results from every dollar you invest in advertising your goods whether it is bees, queens, bee-keepers' supplies, honey, or any class of merchandise, you want exclusive evidence that the paper selected has been no disappointment to those who have tried it for a long time.

Mr. L. H. Robey, Worthington, W. Va., is one of the older advertisers in GLEANINGS, having begun about fifteen years ago. In July, 1903, he said: "I have been breeding Italian queens about twelve years, depending almost solely on GLEANINGS to bring me trade, and for the past three seasons I have been flooded with orders continually and have had to return hundreds that I could not fill." Mr. Robey would not have secured and held such patronage if he did not furnish good queens and give prompt service to the readers of GLEANINGS, neither could he secure such large orders were it not that our readers have such implicit confidence in the advertising admitted to our columns. We take pleasure in submitting the following letter from Mr. Robey:

Worthington West, Va. Sept 19-1907
 AD Post Co

Answering your letter enclosed here in will say Gleanings has never disappointed me unless it was in bringing me more orders than I expected and could fill. For the last 6 or more years I have been unable to supply the demand made on me for Queens. Part of the time this season I was over two hundred Queens behind on cash orders and at this time I am just 70 Queens behind. Any Queens breeder who will do his part will find Gleanings will do its part every time. I am as well satisfied with the returns from my ad in Gleanings as a man could be. Gleanings is a clean bright up to date journal long may she live
 most truly

P.S. I use no other paper L. H. Robey.
 but Gleanings in advertising my business
 L. H. R.

If you haven't already placed your order for advertising space, you should do so at once, stating the approximate date when you want it to begin. Early orders secure select positions. Any information given by addressing

ADVERTISING DEPT. GLEANINGS IN BEE CULTURE, MEDINA, O.

OUR 1908 CATALOG

is ready for mailing. We should like to send YOU a copy. It gives prices and description of "ROOT-QUALITY" bee-supplies. These are the goods that thousands of SUCCESSFUL bee-keepers are using. We are the "ROOT-QUALITY" HEADQUARTERS in MICHIGAN. We save you time and freight expense.

On the back outside cover page of our new catalog we make a special offer on GLEANINGS to both new and old subscribers. If you renew soon or wish to subscribe, let us know.

By the way, did you notice the list of goods that we are offering at a SPECIAL rate in Jan. 15 Gleanings? Look it up.

M. H. HUNT & SON, Redford, Mich.

TO THE BEE - KEEPERS OF CANADA.

WE are pleased to say that we are able to offer, in Canada, goods manufactured by The A. I. Root Co. While we do not offer every thing listed in their catalog, we have selected such articles as we believe will best meet the wants of the Canadian bee-keepers.

The heavy duty and freight charges we have to pay make it impossible for us to sell in Canada at Root's prices. We have, however, made prices as low as possible, and in no case do we charge nearly as much extra as the amount of freight and duty we ourselves have to pay on the goods.

We would ask you, when comparing our prices with those of other dealers, to take into consideration the QUALITY. If you do so we feel satisfied that you will place your order with us. The splendid quality of the material sent out by The A. I. Root Co. has given "Root's Goods" a world-wide reputation. Remember, The best is cheapest."

E. GRAINGER & COMPANY,
Deer Park,
Toronto, Ontario, Canada.

CANADIAN AGENTS FOR
THE A. I. ROOT CO., MEDINA, OHIO, U. S. A.

APICULTORES

De Espana, Portugal y Colonias.

Pidan catalogos de las colmenas, extractores, prensas para cera, ahumadores, zinc perforado, escape de abejas, velos, cuchillos, maquinas para hacer base de panales, y todos otros articulos utiles en apicultura manufacturado por la celeberrima casa de

A. I. Root Company,

la fabrica la mas importante del mundo. Precios muy modicos a los subagentes por mercancias puestas en nuestros talleres.

EMILE BONDONNEAU,

Agente Générale

POR TODA EUROPA Y COLONIAS,

142 Faubourg SAINT DENIS, PARIS. 10me.

SUCCE\$\$ IN BEE-KEEPING

The man who makes a \$ucce\$\$ in bee-keeping is the one who does things when they should be done.

The time to buy goods is before they are needed; not when the rush comes.

Let us send you our catalog for 1908, so you can make out an order now.

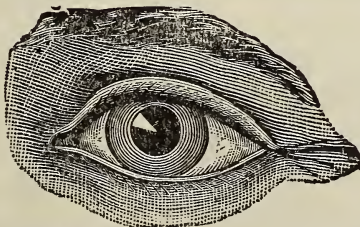
THE A. I. ROOT COMPANY
SYRACUSE, :: :: :: NEW YORK

WE DO NOT SELL ROOT'S SUPPLIES

So many advertisers in GLEANINGS IN BEE CULTURE sell supplies bought from the Root Co. that to explain away a false impression we are compelled to state that we are not jobbers, but *manufacturers*. We make all the Bee-supplies we sell. Minneapolis is the largest lumber-distributing point in America. We buy lumber to advantage; we manufacture by water-power; we have lowest freight rates, and we sell on manufacturer's profit basis. **Let us quote you prices.**

MINNESOTA BEE-KEEPERS' SUPPLY COMPANY
DEPT. 22 MINNEAPOLIS, MINN.

Keep your



on this ad.

We intend to keep a full stock of The A. I. Root Co.'s goods on hand this season, as we have in the past. When in need of bee-supplies, write us. Get our catalog at once. For prompt shipments and good service, we are at your command.

JOHN NEBEL & SON SUPPLY CO., HIGH HILL, MONTGOMERY CO., MISSOURI.

What's the Matter With Hilton?

WHY, HE HAS A LOT OF SUPPLIES HE WANTS TO LET YOU HAVE WITHIN THE NEXT SIXTY DAYS AT A DISCOUNT, TO MAKE ROOM FOR THE NEXT SEASON'S GOODS. JUST SEND A LIST OF WHAT YOU WANT AND GET ESTIMATE. IF YOU HAVEN'T HIS FORTY-PAGE ILLUSTRATED CATALOG, SEND FOR IT AT ONCE.

CASH OR SUPPLIES FOR BEESWAX AT ALL TIMES

GEORGE E. HILTON
FREMONT, :: :: MICHIGAN

Bee and Poultry Supply House.

We are now in position to offer the beekeepers of Northern New York a full line of Bee and Poultry Supplies, etc., including Incubators, Brooders, Rochester Spray Pumps, Asphalt Roofing, etc. Catalog on request.

A. H. REEVES & CO.,
411 Main St, Watertown, N. Y.
Both Phones.

Eastern Bee-keepers

We furnish every thing a bee-keeper uses and allow

a liberal discount for early orders. We keep all supplies in stock, and can ship promptly by any route. Let us quote you on what you want? Catalog free.

I. J. STRINGHAM,
Apiaries—Glen Cove, L. I. 105 Park Pl., N. Y. City.

THE DANZENBAKER SMOKER

PAT. OCT. 3, '05, JUNE 4, '07

GOLD MEDALS
St. Louis Exposition, 1904
Jamestown Exposition, 1907



IS THE BEST,
STRONGEST,
COOLEST,
CLEANEST,
CHEAPEST,
AND LARGEST
SMOKER SOLD
FOR A DOLLAR

The perforated side grate seen above holds a removable, metal, asbestos-backed fire shell, preventing burning the tin off the outer case, and deflects the air at right angles, preventing back draft to the valveless bellows. The air, passing to the back and over the top, cools and expels the smoke, fanning the burning fuel at top or side till all consumed, giving cool smoke for hours from one filling. It can't clog. No top-heavy cap to choke with soot; no valve to fail; no holes shedding sparks or hot ashes.

Four years' sales prove its success beyond a doubt, expensive dies making it uniformly perfect as possible to devise. We confidently guarantee full satisfaction or refund the price.

Price, \$1.00; 3 for \$2.50; by mail, add 25c. each

Send address of yourself and Bee friends for 8-page leaflet on "Smoker," and facts about Bees and Queens, 80 pages, free.

F. DANZENBAKER, Norfolk, Va.

1884

1908

Root's Goods always in stock

FOR YOU

Twenty-two successful years manufacturing bee-supplies and raising Italian bees and queens.
. Root's Goods in Stock.

J. M. Jenkins

Wetumpka, : : Alabama

Dittmer's COMB FOUNDATION

is the best, not because we say so, but because the bees prefer it to other makes.

Dittmer's Process is Dittmer's

It has built its reputation and established its merits on its own foundation and its own name.

We make a specialty of working wax into foundation for cash.

Write for free catalog, and prices on full line of supplies.

GUS. DITTMER CO., Augusta, Wis.

Hammer Free!

With Every Order of Supplies of \$5.00 or Over.



This is the handiest tool for nailing up hives, frames, and all parts, or for opening up hives. Made of steel, nickeled.

Three per cent discount off all prices in catalog.

FULL LINE OF ROOT'S GOODS

NO CHARGE FOR DRAYAGE.

John N. Prothero
Dubois, .. Pennsylvania

Northwestern Bee-keepers!

We are headquarters for the ROOT supplies for the States of Montana, Minnesota, the Dakotas, and Western Wisconsin.

You can save freight by ordering from this branch. A complete line of bee-keepers' supplies always in stock.

Secure a catalog at once.

BEEES and QUEENS.—Your orders will be attended to.

The A. I. Root Company

H. G. ACKLIN, MANAGER

1024 Mississippi Street, St. Paul, Minn.

At St. Louis

On a  Line

to all points in the South and Middle West.

Send for our free illustrated catalog of

Root's Bee-supplies

We sell at factory prices. Send us a trial order.

Beeswax Wanted.

Blanke & Hauk Supply Co.

DEPT. B,

1009-11-13 Lucas Ave. St. Louis, Mo.

Manufacturers and Jobbers of Dairy, Creamery, Ice-cream, and Poultry Supplies.

North Texas Bee-keepers

will find Dallas the best point from which to purchase supplies. We have a carload of **ROOT'S GOODS IN STOCK**, and sell them at the Factory Prices. Don't forget that we can furnish any thing in the way of Field or Garden Seeds, Plants, and Poultry Supplies. Our large illustrated catalog for 1908 free on application. Mention GLEANINGS when you write.

TEXAS SEED AND FLORAL COMPANY

Dallas, : : . Texas

**HAVE
YOUR
HIDES**

**MADE INTO FURS FOR
THE WHOLE FAMILY**

Don't sell your hides—it's poor economy. Send them to us and have them made into Fur Coats, Robes, Mittens, etc., and keep your whole family warm this winter. Any color horse or cow hide looks well. Our process makes them soft and pliable, as well as moth-proof and water-proof.

No matter where you live we will pay the freight on all Hides sent to us to be made into Coats and Robes.

We guarantee complete satisfaction with all our work. Don't send your hides to inexperienced tanners and be disappointed. We are the largest firm in the country that tans, manufactures and sells direct to the consumer. We are equipped in all departments to do first-class work. We'll make you a robe from your hide, lined with best plush, for from \$7.00 up; a coat made to your measure, lined and trimmed in splendid style, for from \$9.50 up. With every coat or robe we make we furnish free a fine pair of Fur Mittens, with horse-hide palms. One large hide or two small ones makes a coat like one shown here. We also make long or short coats for ladies and for girls and boys. Calf, goat, dog and colt skins make elegant Floor Rugs, and Gauntlet Gloves and Mittens. We tan any kind of skins, wild or domestic, and make them into furs to order. Our prices are reasonable, while the quality of our work is of the highest order. Write us before you sell a single hide; ask for our 40-page catalog giving full particulars and showing our full line of fur goods. Write today.

National Fur and Tanning Co.,
219 Hooker Ave., Three Rivers, Mich.



This is the Book that will Increase Your Fruit Profits



**A DOLLAR
BOOK FOR
1 CENT**

High Grade Fruit Trees, Vines and Plants

Special low prices on Plum, Apple, Peach and Dwarf Pear Trees, Roses, also Asparagus Roots, Currant Bushes and other small fruits. Order trees direct from our nursery and save agent's profits and half your money.

Everything you want for Orchard, Garden, Lawn or Park. Send to-day for Green's Dollar Book on Fruit Growing, also for our Fruit Catalog, and a copy of Green's Fruit Magazine, all a gift to you.

GREEN'S SAMPLE OFFER One Elberta Peach Tree, one Red Cross Currant Bush, one C. A. Green New White Grape Vine, one Live-Forever Rose Bush, all delivered at your house by mail for 25 cents.

Plum Trees \$6.00 per hundred.



GREEN'S NURSERY CO.

Rochester, New York

Box

FREE! 50 lbs. Comb Foundation FREE!

WEED'S NEW-PROCESS COMB FOUNDATION.

PRIZES GIVEN AWAY

ABSOLUTELY FREE IN A CONTEST.

FIRST PRIZE—25 lbs. Comb Fdn.

THIRD PRIZE—5 lbs. Comb Fdn.

SECOND " —10 lbs. Comb Fdn.

FOURTH " —5 lbs. Comb Fdn.

FIFTH PRIZE—5 lbs. Comb Fdn.

THE ABOVE PRIZES will be given absolutely free to those who will make the largest number of words out of the letters found in the name "Toepperwein." The letters may be used over as many times as desired, but in no single word oftener than found in the name "Toepperwein." Only words found in Webster's dictionary are admitted. The words must all be plainly written in columns, and numbered.

This contest is absolutely free to any one and anywhere. It is a fair contest, and one has the same chance as the other. These contests are very instructive, and just the thing for schoolchildren to pass the evenings. The contest will close May 1, 1908, and all lists with words must then be in, and in May 15th GLEANINGS the results will be published, giving the names of the winners and all the words of the one who wins the first prize. The winners have the privilege of choosing any grade of foundation. We feel confident that the winners will be highly pleased with the prizes, as the comb foundation is as fine and perfect as any machinery can make, and is made right here in our factory out of this clear Southern beeswax.

Now do not lay this aside and put it off until some other time, but begin right now and start the list. Write the words in a little memorandum-book and carry it in your pocket; and every time you think of another word mark it down. There are a great many words to be made out of the name "Toepperwein," and you have just as good a chance as any one else; so do not let any time go by, thinking some one else may have more words. Now, understand you are welcome to enter this contest, no matter whether you own bees or not, nor whether you are old or young, nor where you live. In case any of the winners have even numbers, then the amounts will be equally divided between such winners.

ROOT'S BEE-SUPPLIES.

We always carry a large and complete stock of The A. I. Root Co.'s make of bee-supplies at Root's factory prices. Write us for illustrated catalog and price list.

HONEY AND BEESWAX.

We buy honey and beeswax at all times. If you have any to offer, write us stating quantity you have, quality, and your best price delivered at San Antonio. We also work beeswax into comb foundation by the pound at reasonable rates. We should like to have some business from associations in other States who have large quantities to work up. Our capacity is 500 lbs. per day.

We have just received a set of new machinery, and our *Weed New Process Foundation* is perfect and gives perfect satisfaction everywhere.

Whenever you are in San Antonio make our office your headquarters and let us show you through our plant. Stay here a while and meet the bee-keepers as they come in. You are always welcome and will be courteously treated.

UDO & MAX TOEPPERWEIN,
1322 South Flores St. SAN ANTONIO, TEXAS.

**"If goods are wanted quick, send to Pouder."
Established 1889.**

The Bustling Busy Buzzing Bee.

By the Bee Crank.

**"For where's the State beneath the firmament,
That doth excell the bees for government?"**

So wrote Du Bartas more than 300 years ago, and men are still learning from their miniature teachers. Before you can say "scat," the bee will begin to get busy foraging for you in sublime but, alas! often misplaced confidence because you are not fully prepared to furnish the bees with proper facilities. Order your supplies to-day. I am ready. I haven't a shopworn article in my house. My patrons do not give me a chance to accumulate dead stock. I am still making a



specialty of quick shipments; and Indianapolis is so located that they go direct. It's a main line from me to you, regardless of distance. I have comb foundation ready for immediate shipments in exchange for beeswax, on which I allow you 30 cents per pound in trade. I have a big lot of bright new Danzenbaker hives and a complete line of Root's goods at Root's prices. All of them and many other bee requisites are shown in my new 1908 catalog, free for the asking.

Walter S. Pouder, Indianapolis, Ind.

Goods, ordered of you recently, arrived in first-class shape and very promptly. I have frequently had to wait over a month for goods ordered only a couple hundred miles from here. Many thanks for your promptness, and I, too, know where to send when in need of more goods.

Macon, Ga., Feb. 3, 1908.

Respectfully, F. C. RRES, Jr.

Walter S. Pouder,

513-515 Massachusetts Avenue, Indianapolis, Ind.

GLEANINGS IN BEE CULTURE

Published by The A. I. Root Company, Medina, Ohio

E. R. ROOT, EDITOR
H. H. ROOT, ASST. ED.

A. L. BOYDEN, ADVERTISING MGR.
J. T. CALVERT, BUSINESS MGR.
A. I. ROOT, EDITOR OF HOME DEPARTMENT

Vol. XXXVI.

FEBRUARY 15, 1908.

No. 4



IF JAY and the "other" two dogs experiment any more as on page 145, please print conclusions only in copy of GLEANINGS sent to me. Circumstantial details are too hard on suspender buttons "in this locality."

ONE OF THE weakest points in the production of comb honey in Quebec has been the production of combs attached only to the bottom and sides of the sections, p. 153. How under the sun do they keep the bees from attaching them at the top?

THE EDITOR of *Canadian Bee Journal* having objected that comb honey was unwholesome because the wax had to be melted in the stomach, D. Anguish comes at him in this wise: "For my part, I think that is where the unhealthy part comes in with your customers—heating them up so hot as to melt the wax."

A PAIR OF FOWLS valued at \$2000 were on exhibition at the Chicago show. An ordinary queen bee sells for about the same as a pair of ordinary fowls. If a queen of great value were rated at \$2000 the idea would be hooted. But why should there not be the same difference between the common and the best in bees as in fowls?

G. M. DOOLITTLE, p. 143, grudgingly admits that drones help keep up heat in a hive from which a swarm has issued, when the workers are few. Friend Doolittle, wouldn't drones help just as much to keep up the heat "when the workers are few" in a weak colony in the spring, or at any other time? Oh! "workers are better for that," are they? Then why not after swarming?

AS POSTSCRIPT to hot-air liquefying, p. 145, which I suppose is valuable because of its slowness, let me advise those with only a

small quantity to liquefy, to set it on the reservoir of the cook-stove, where it may take three or four days to liquefy, but can never be overheated. [Yes, the reservoir on the back of the stove is the handiest place; but, unfortunately, only a very small quantity of honey can be liquefied there.—ED.]

"LABELING THE WEIGHT," p. 141. Does that Nebraska law really demand putting the weight on a section of honey? Does it not refer to packages already put up? If a grocer weighs a pound of coffee, and wraps it up, is he obliged to label it? Does a section of honey come under the head of "package of food," if not previously wrapped up? [We do not see any thing in the exact wording of the law, page 141, that warrants your conclusion. When the law is not specific it is wise to err on the safe side.—ED.]

WHAT GOOD REASON is there for having more than $\frac{1}{4}$ in. space between bottom-bars? [We suppose you mean $\frac{1}{4}$ inch on a vertical line between the bottom-bars. Such close spacing would be decidedly objectionable if used in sectional hives; for it is desirable to have bottom-bars narrow enough so that one can look up between the combs when the brood-chamber is lifted up. With wide bottom-bars leaving only $\frac{1}{4}$ -inch space it would be difficult to arrive at any conclusion as to the condition of that particular sectional brood-nest.—ED.]

"WITH THE SYSTEM of lifting up the partly full super and placing the empty one under, one has to be very careful or too much room will be given. In this case the sections will be light weight, and poorly attached to the wood, so they will not stand shipment as they should," *Review*, 13. Before using bottom-starters I had trouble with sections that would not stand shipment; with bottom-starters I can not see how such a thing is possible. One of the first things the bees do is to fasten the two starters together, and, so far as concerns the comb breaking out of the sections, they would ship in perfect safety when less than half filled.

C. P. DADANT, *American Bee Journal*, 15, objects to the attempt to have two queens working in a hive, risking the life of one or

both, and says the only time to make it profitable would be early in the season so as to have a strong force for the harvest. But, friend Dadant, why didn't you go a step further? Early in the season no more brood can be matured than the bees can cover, and at that time there are generally not enough bees to take care of all the eggs one queen can lay; so if ten, queens were added how could it increase the force of bees? I have never taken any stock in doubling queens to get strong colonies, but counted it a big thing if we could thus winter extra queens and prevent swarming. If these things fail us we can only sigh over blighted hopes, and start looking for some other thing new and good.

G. M. DOOLITTLE, page 23, says buds for basswood blossoms are formed in June and July in the preceding year, and that we can distinguish these blossom-buds in May; and H. S. Wheeler wants to know if I have found it so, and if the same thing is true as to the grape. I never watched the grape very closely, so I can not say about that, and I do not know exactly how long before blooming I have recognized basswood-buds; but I am quite familiar with blossom-buds on fruit-trees, and can go out any time in the winter and show you the blossom-buds of apple, pear, plum, or cherry. So characteristic are the blossom-buds on apple-trees that I can tell quite often by the look of a bud in January whether it was taken from a Dutchess tree, a Talman Sweet, or some other variety with which I am acquainted. Blossom-buds on cherry-trees are *easily* distinguishable before the leaves fall the preceding summer.

PROHIBITION, nowadays, is all the while cropping out in new places and in new ways. The great mail-order house of Sears, Roebuck & Co., Chicago, handed each of its employees a circular, saying, "Entering any saloon within a certain proscribed district at any hour of the 24 hours of the day is absolutely prohibited. This district is bounded by Jackson Boulevard, West 40th St., 16th St., and California Ave. This prohibition went into effect April 1, 1906, and employees discovered in saloons in that district will have placed themselves in a position where their services are no longer desirable." The general manager says, Jan. 21, 1908, "This attitude we still rigidly maintain, and we feel that the policy has worked great benefit to our institution as well as to the employees themselves." [The action of the railroad companies and other industrial concerns along the same line only goes to show that the liquor-traffic has got to step down and out very soon.—ED.]

MR. EDITOR, you say, p. 140, that if supers with the Miller escape are piled distant from hives you don't see how it is possible for young bees to get back to their hives; but if placed near the entrance they might crawl in. Why, man alive, they fly—why shouldn't they? I suspect you have in mind that some are so young that they have not yet flown, and so do not know the way home. I won-

der if bees ever leave the brood-combs before their first flight; at any rate, in the hundreds of times we have used Miller escapes I have yet to see the bee so young that it didn't come out and fly away—somewhere. Don't you think it would go to its own hive? Even if it should go to some other hive, what harm? [This whole question hinges on whether young bees leave the brood-combs before they can fly. We would have said that they would, but possibly we are mistaken. If so, we stand corrected. We shall be glad to get expressions from our subscribers on this point—that is, if a pile of supers containing bees, just as they come from the hive, be placed at some point remote from any colony, do all the bees, old and young alike, after passing the escape, go back to their respective hives? or will some of the young bees be lost? It is our impression that, some years ago, when we tried this Miller bee-escape on a pile of supers, there was a lot of young bees clustered around the outside of the pile; and that is why we have always supposed that a bee-escape so placed as to deliver the bees back into the brood-nest whence they came was better than one that delivered them out in the open air.—ED.]

THAT SECTION STRAW, p. 140, looks as if it were footnoted by the Artful Dodger. My five or six questions are utterly ignored, and some talk given that doesn't bear any too much upon the subject. Please go into your secret chamber, Mr. Editor, taking your conscience with you, and answer to yourself the questions I asked, and see if you don't think it better to call a story a story, and not a section. You think the phrase "sectional hive" would not be misunderstood "unless one is woefully ignorant of apicultural terms." Neither do I, for "sectional" has not been in use with regard to sections. But "section"—and that's the word we were talking about—might be misunderstood if used in the two ways. Only this morning I happened upon it in reading, where it was hard to decide which meaning it had; and I am not so "woefully ignorant" as I might be, either. [You have apparently jumped to the conclusion that the editor was arguing against you, when, as a matter of fact, he *thought* he was helping to establish your position, in part. Read the footnote over again and see if you do not come to that conclusion. The footnote in question was based, not on your particular statement, but on all the discussion that had been going on, concerning which your last statement was the "last straw."

We did not say that we sanctioned "section" as referring to a shallow brood-chamber. If our space had not been limited we would have (and hereby do now) tabooed that word in that connection, and shall endeavor hereafter to cross it out when it is used by a correspondent. We are of the opinion that we nearly if not quite agree; but we see no need of coining new terms for "sectional hives," "divisible brood-chambers," "stories," etc., as urged by some.—ED.]



MARYLAND has no pure-food law. The *State Agricultural College Quarterly* says it is time it had one. It is. The bee-keepers will have to stir them, probably, before the law-makers will do any thing.

WINTER is starting out on the first of February snug and cold. We much prefer to have it cold at the right season of the year in order that we may have other seasonable weather in its season. A cold February and March is quite sure to be followed by a mild and early spring; but a warm February and March will be almost sure to be followed by a bad April or May. Nature seems to try to establish a balance of weather.

HIGH EXPRESS RATES.

THE railroads have steadily reduced their rates for a number of years; but the only move made by the express companies in 18 years has been to raise them, which they did when the United States levied special taxes on account of the Spanish war. They raised their rates to meet these taxes. The taxes have been long since removed, but the rates have not been reduced in the least as they ought to have been. W. K. M.

THE BAR SINISTER.

ACCORDING to press dispatches from the seat of government, President Roosevelt is very much interested in the controversy with regard to corn syrup vs. glucose. One reason for this is because the business of manufacturing glucose is supposed to be in the hands of a trust. Another reason, so it is said, is the fact that the Standard Oil Co. is financially interested in the company controlling the output of glucose. W. K. M.

SPECIAL ARTICLES IN THIS ISSUE.

THERE are several articles in this issue to which we wish to call special attention. One is a contribution on sweet clover, by Frank Coverdale; another, on the folly of using swarming-cells, by E. W. Alexander; another, on home-made windmills, by T. P. Robinson; and, last, the automatic uncapping-box, by L. E. Mercer, a device by which cappings are melted as fast as they are shaved off the combs. There are other valuable contributions in this issue, all deserving a careful reading.

ITALIAN BEES FOR JAPAN.

F. JAY LEWIS & SON, of Oak Park, Cal., recently sent two full colonies of Italian bees to Japan, and, according to advices

since received, the shipment was entirely successful. It may be asked why it was necessary to send full colonies. The reason is obvious when we remember that the bees of Japan are smaller than ours, and therefore the comb cells are too small to raise our bees in to maturity. Mr. Y. Suminokuru, Tokio, Japan, is now the owner of the two colonies so successfully transported.

W. K. M.

WAX-MOTHS AND AMERICAN FOUL BROOD.

THE above is the title of a small bulletin issued by the United States Department of Agriculture. As its name indicates, it deals with the relation of the wax-moth to the spread of foul brood. The author, Dr. E. F. Phillips, comes to the conclusion the wax-moth does not prevent the spread of foul brood when it eats up the combs, as the bacteria are still present. There are three plate illustrations. The Superintendent of Documents, Government Printing Office, will supply copies at 5 cts. each. W. K. M.

CATTLE AND SHEEP VS. BEES.

THE western sheep and cattle men, at least a great many of them, are protesting against the passage of the Burkett bill now before Congress, providing for the leasing of all public grazing lands. So far as bee-keepers are concerned, however, the case is different, because it would provide against overstocking a location with bees. Also two of the worst enemies of the bee business would be controlled, namely, sheep and goats, which are likely in the end to eat up every flowering tree and shrub on the face of the landscape. This has actually happened in certain localities where the range has been overstocked with sheep, cattle, and goats. The prime objects of the Burkett bill are to provide against overstocking, and against the cattlemen's and sheep-herders' wars.

W. K. M.

FIVE THOUSAND BASSWOOD SEEDLINGS AT AU SABLE, MICH.

THE following clipping has been sent us, and will explain itself:

BAY CITY, Mich., Dec. 17.—Wm. B. Merston, speaking of the work along forestry lines being done on the Au Sable forestry farm, said: "We have just contracted with the forestry nursery at Dundee, Ill., for 5000 basswood seedlings. These are two years old, and they will be put out as soon as the weather is favorable in the spring. It is an interesting fact to note, that basswood seeds do not germinate the first year of planting, but germinate in the second to the fifth year."

Basswood is now extensively used for packing-boxes, etc. A few years ago it was not used for such purposes; but it has been found to be an excellent substitute for pine, formerly so largely used in that way.

If this plan were to be carried out by other States it would go a long way toward solving our section problem for the future, and at the same time give us the old-fashioned flows of honey from basswood. Of course, it would take years to get results; but it is high time that we were beginning to do something, for the paper and furniture industries alone are cutting annually

enormous quantities of this valuable timber; and unless some effort is made to replace it, coming generations will suffer hardship.

SWEET CLOVER AS A FORAGE-PLANT FOR CATTLE.

On p. 147 of this issue will be found some very valuable and interesting testimony showing how cattle, *when once educated to it*, will actually ignore timothy and alsike clover—two of the supposedly best forage-plants in the world, and eat sweet clover clean down to the ground. All the more surprising it is that so many State legislatures have declared that sweet clover is a noxious weed, and that, therefore, the road supervisors must keep up an unremitting warfare against it. We hope our readers will seek the ears of their Senators and Representatives, and ask to have the law against noxious weeds amended, eliminating sweet clover from the list.

A NEGLECTED FIELD.

THERE is a demand for a method of serving small portions of comb honey at hotels and on dining-cars, without drip or the messing of dishes. Quartering up a section of honey is not entirely satisfactory unless four people are served at one time. What is wanted is a plan for cutting up a sealed comb in an extracting-frame into small portions, washing off the drip and wrapping in waxed or paraffine papers. The problem is, how to do this without too great an expenditure of labor, and yet at the same time have something that is neat and attractive. If this can be done in a manner satisfactory to the hotels, restaurants, and dining-car people, a big demand for honey at good prices will be assured. We should be glad to hear from any one who knows how to meet the requirements.

BEEES AND RHEUMATISM.

WE notice in the *Youth's Companion* for Feb. 6 that "Dr. Ainley Walker, of University College, Oxford, England, has undertaken to solve the question whether, as popular belief in many countries has long asserted, the poison of bees' stings acts as a prophylactic and a cure in case of rheumatism. As he has recently been able to collect some definite evidence in support of this belief he invites correspondence from all persons having personal knowledge of the subject. Among other facts which he believes to be established is a connection between rheumatic fever and the production of formic acid (the acid of bee poison) in the human body." We hope bee-keepers in a position to give evidence will be kind enough to write Dr. Walker, stating the facts. W. K. M.

MORE ROMANCE.

MÆTERLINCK has written a book entitled "The Intelligence of Flowers," "which," *The Independent* says, "is, like 'The Life of the Bee,' a unique combination of fact and

fancy, scientific in its statements, humanistic in its interpretation of them, mystical in its philosophy, and poetical in its expression." Our contemporary hits the nail on the head. The features which it characterizes so well are calculated to make any book sell, and in this respect Maurice Mæterlinck is one of the greatest writers of this or any age. No doubt "The Intelligence of Flowers" will be as popular as any of his previous works; but it is a peculiar commentary on our civilization that a book which is not true is far more popular than a strictly truthful one. Some allowance must be made for the fact that the elegance of diction and beautiful ideas are worth something, and in this the great Belgian certainly excels. W. K. M.

VERY LITTLE ADULTERATION.

THE annual report of the Connecticut Experiment Station relating to the analysis of food products has this to say on the subject of honey adulteration:

Formerly strained honey was extensively adulterated with glucose, and to some extent with cane sugar. It was also a common practice to feed bees with sugar, which yielded, when stored in the comb, an inferior and flavorless product. At the present time these frauds are not so commonly practiced.

During the present year 45 samples of strained honey were bought and examined, of which only one was adulterated. A description of the adulterated sample follows:

17997. Label: "Hallett Table Water Co., Bridgeport, Conn. Nonquit Pure Honey. Superior quality. Sparkling, delicious." Dealer: S. Manjoney, 1362 Main St., Bridgeport. Per bottle, 15 cents. Adulterated with glucose.

It seems to us this is a very satisfactory report from the land of wooden nutmegs, and yet it is our opinion that other States can make a showing equally good. Honey adulteration has practically ceased, and consumers are well protected against fraudulent honey. One case in forty-five is a small percentage, and probably that was bottled before the national pure-food law went into effect. W. K. M.

TOO MUCH BOTTOM VENTILATION IN CELLAR DETRIMENTAL.

IT will be remembered that we had last year a large amount of bottom ventilation for our cellar-wintered colonies. Even before the first of the year they were wintering very badly, and before the time of setting them out we had lost nearly 90 per cent, as we afterward learned. This year, in the same cellar, under the same conditions, we put in another lot of bees of about the same strength, but with a narrow contracted entrance, $\frac{3}{8}$ × 8 inches—just the same the bees were having in the late fall outdoors, and, presto! what a change! They are wintering finely.

Last winter, when we lost such a heavy percentage of our bees, there was one colony that, by mistake, was shut up tight during almost all the winter, and it wintered the best of any colony in the cellar. This we considered to be a "pointer" showing that too much ventilation, in some cases at least, is decidedly bad.

With small entrances we have had ideal wintering in our bee-cellar; but when, last year, we gave a large amount of ventilating space under the hives, something "happened." We are not positive, of course; but it looks very much as if too much ventilation for indoor-wintered bees was bad. It seems reasonable that a colony of bees should have a warm hive, even in the cellar. If a third of the bottom is open to cellar air, then they must consume too largely of their stores in order to keep up animal heat. This results in the clogging of the intestines, and then dysentery. If there is a furnace in the cellar this large amount of ventilation would do no harm, because the atmosphere would be reasonably dry and fairly warm.

HONEY AS AN ARTICLE OF FOOD AT OUR LEADING HOTELS.

THE editor has been making numerous trips in various directions over the State of Ohio, and he has been gratified to see that honey and maple syrup are now being placed side by side as two standard delicacies and desserts at our leading hotels. The day was when honey was never mentioned; but since the advent of national and State laws the inferior and spurious sweets have been so thoroughly tabooed that the leading hotels do not care to recognize them. They take pride in offering only the best in the line.

We wish to offer a suggestion right here to our readers; and that is, that they see to it that the leading hotels in their vicinity are supplied with a first-class article of honey. Do not let them go to the local retailers and get an inferior product.

Traveling men are great advertising mediums. Supply them with good honey, and the demand for the article will increase enormously, as they will introduce it in their homes and talk about it to their patrons.

Our own local hotel-keeper of the American House finds an increasing demand for honey on his table; but he stipulates that his patrons shall have the very best that money can buy. His customers come from all over the United States; and when they arrive at the town where there are so large investments in bees and bee culture, they naturally expect to find the finest and best of honey, and they are not disappointed. We are furnishing to the hotel alfalfa because we have not much else of late. These traveling men are loud in their praises of this honey, even inquiring where it can be obtained, in order that they may keep it in their homes.

THE WELLS SYSTEM.

THE present discussion regarding the possibility of retaining more than one queen in a hive brings back memories of the time when the pages of the *British Bee Journal* teemed with references to the Wells hives, which were (and are) worked with two queens. In this hive the queens are separated by a wooden division-board having perforations $\frac{1}{8}$ inch in diameter. This does not allow the bees to pass, but allows the same odor to perme-

ate the whole hive. In some cases the bees were allowed to work together on the same sections, the latter being placed above a queen-excluding honey-board. The reason why a wood division-board was used was to allow the bees to form one cluster, one colony clinging to one side of the board, and the other to the opposite side. The division-board gets clogged with propolis, and it is quite a job to clean it; but some hold there is no need of cleaning it very often, as the colonies retain the same odor in any case.

In the years 1893, '94, '95, '96, the *British Bee Journal* gave all due aid and encouragement to the double-queen system; but we see little about it now.

Dzierzon was a strenuous advocate of more than one colony in a hive, twin hives being his favorites, and he also had four-colony hives in his apiary. He did not advocate these hives to be worked as single colonies, but merely from the increased warmth and comfort engendered by the bees being associated together under one roof.

Some experimenters with the Wells system actually kept as many as four queens—two above the zinc and two below—the two upper ones being young queens to take the place of those below.

In one instance, at least, a swarm issued from a Wells hive which weighed 14 pounds. It does not follow, because the Wells system did not succeed in establishing itself, that the underlying idea should be discarded. The two-queen system requires rather skillful management, and for that reason it appeals more to the specialist than any one else.

W. K. M.

"ARE BEES REFLEX MACHINES?"

DON'T be scared at the title. It is not so "reflex" or, rather, complex, as it may seem. The title means, in other words, Are bees purposive or reasoning machines, or do they act automatically and unconsciously through instinct? We may say that scientific men are not agreed as to where instinct ends and reason begins in animals. This whole question is discussed in a masterly way; and so far from being dry scientific reading it is intensely interesting.

It has been some time since we promised to begin the publication of this valuable work; but we have been delayed by one thing and another until some of our readers began to wonder whether we were going to make our promise good. This, it will be noted, we are doing in this issue on p. 223.

Dr. von Buttel-Reepen (whose picture appears on p. 222), the author of the paper, is not only a practical bee-keeper, but a man of science. His deductions and conclusions, therefore, on the natural history and habits of the honey-bee will be read with more than ordinary interest. He strikes on a number of interesting problems, viewing them not only from the standpoint of science but from practical every-day work. He does not claim to be infallible, for, in fact, he leaves his readers to do some of their own thinking, placing before them a collection

of interesting data on which he himself draws certain conclusions which the reader may accept or reject as he prefers.

Instead of only a page or two at a time we are placing before our readers whole chapters, and these will be given in every fourth or fifth issue of this journal in order that the reader may have opportunity in the mean time to think over and digest some of the leading points.

So valuable is this paper that we have already printed it in pamphlet form, consisting of 48 pages, which will be furnished for 35 cts. per copy postpaid.

We may say that the work was originally published in German, and caused a great deal of comment in Europe. Dr. E. F. Phillips, of the United States Department of Agriculture, in charge of apiculture, was so much pleased with it that he strongly urged us to publish it in English. After going over the translation we were delighted with it, and now take pleasure in placing it before our readers.

Dr Phillips has read carefully every page of this, comparing carefully the translation with the original German; and it will be observed that he has made in some places a few comments of his own.

As will be noted in the preface the author has carefully revised the old edition, adding some new matter gleaned from his later experience. Taking it all in all, we believe we are offering to our American readers a gold-mine of interesting information on the natural history of the honey-bee, and practical also, because it will enable the bee-keeper to earn more dollars from his bees.

BEEES VS. SMELTER SMOKE; A SERIOUS CONDITION OF AFFAIRS.

GLEANINGS alluded, p. 616, May 1, to the total extinction of the bee industry in the Jordan Valley country in Utah, and to the successful efforts of the Utah Bee-keepers' Association in compelling the smelter-owners to compensate the apiarists for the loss of their bees and hives. No compensation was made or offered for the loss of the annual income which would naturally arise from the industry. The locality was particularly good for bees; and as the number of colonies it would naturally support is somewhere near 20,000, it follows the annual income lost to the State is between \$100,000 and \$200,000. This looks like a serious loss to the State.

But this is not all. Other industries are being affected by the presence of the smelters; and Mr. E. S. Lovesy, President of the U. B. K. A., returns to the charge in the Dec. 21st issue of the *Deseret Farmer*. He shows the situation is quite serious. He states, "Even now many are complaining of weakness, indigestion, head dizziness, sore eyes, etc.; and in order to try to obtain better health many people have moved from their homes. With these facts staring us in the face, and also the fact that the soil itself is being destroyed for agricultural purposes, we think that something should be done."

It certainly looks as if something should be done, and GLEANINGS is willing to do all it can to help in the good work; and we are decidedly of the opinion the whole fraternity of bee-keepers would lend a helping hand in a great struggle. United, we stand; divided, we fall.

The smelters can find many localities in Utah where there is no agriculture, and where their presence would do no harm. Public opinion alone will force the smelting-works to move, and we respectfully suggest to our Utah friends to commence at once creating a sentiment against these smelters being permitted to destroy the agriculture of one of the most beautiful valleys in the West. The law of priority certainly applies here with great force; and with the strong backing of public opinion the farmers ought to win.

W. K. M.

BEE-KEEPING IN THE HAWAIIAN ISLANDS; IS THERE A POSSIBILITY THAT HAWAIIAN HONEY MAY COMPETE WITH AMERICAN HONEY?

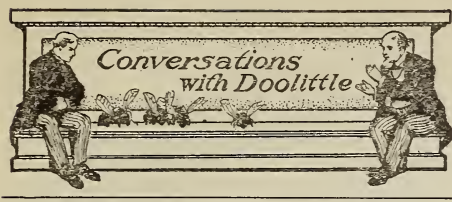
It is not generally known, perhaps, that big syndicates are keeping bees in the Hawaiian Islands, and that the business is said to be very profitable; but, unfortunately for them, their honey does not conform to the United States standards, and therefore must be sold as honey-dew honey, which it greatly resembles. So great are the bee-keeping interests of Hawaii that the United States government is about to send Dr. E. F. Phillips, in charge of apiculture at the Department of Agriculture, to investigate conditions there, and to give the results of his findings in a bulletin which, doubtless, will be issued later. He expects to sail for Honolulu on the 20th of February, on the trans-Pacific transport Crook, of the War Department, returning after a sojourn of some weeks on the islands.

The fact that our dear Uncle Sam (or, more exactly speaking, Dr. L. O. Howard) is sending one of his employees to investigate bee-keeping conditions in our Pacific possessions shows how much interest he is taking in bee-keeping in general. We certainly appreciate the many services he has rendered us already, and especially his interest in this matter. Whether Hawaiian honey will ever be a serious competitor to the American product, we can not say. Cuban honey, at least of late years, has not proven so.

LEASING THE PUBLIC LAND.

DESPITE considerable opposition in certain quarters, the proposal of President Roosevelt to lease the land belonging to the federal government is gaining friends rapidly. Buffalo Bill is reported to be strongly in favor of the move. This means a good deal to bee-keepers whose bees graze on government land, for under the new system it would be possible to get exclusive rights to a bee-range, either at a nominal figure or no charge at all, as is now the case on forest reserves.

W. K. M.



KEEPING 1500 COLONIES FROM SWARMING.

"My name is O. B. Metcalfe, and I should like to have you tell me how to keep my 1500 colonies of Italian and hybrid bees from swarming next spring. Here in New Mexico I can get no skilled help, with the exception, perhaps, of one man who knows something of bees, so I shall have to do most of the work myself. Can you refer me to some good treatise on the control of swarming?"

"I know of no plan for controlling swarming which has been put into treatise form, and I am not sure that any one in the world knows of any plan which will do away with *all* swarming under *all* circumstances, or during all seasons and in all localities."

"Then you do not think that I shall be able to keep my 1500 colonies from swarming?"

"I do not think that there is a person in the United States who could keep *all* those colonies from swarming in a season conducive to excessive swarming; but I do think that, in seasons where the desire to swarm is only ordinary, swarming can be nearly prevented, and also reduced considerably in a year when the tendency is toward excessive swarming. However, allow me to say that *one* man would have better prospects of accomplishing what he desires along the line of swarm control with 500 colonies than he would with 1500."

"I presume that is right; but in the absence of help to be depended on, I must do the best I can alone, or with what little help I can get. I had thought of making a nucleus from every strong colony, something after the plan you gave on page 1433 of the November 15th issue, 1907; but I wish you would tell me what would be the result if the expected harvest did not come."

"The result would be very nearly the same as it would be in following any similar plan when the crop fails; that is, we should have all of our labor for nothing, or very nearly so."

"But might it not be worse than this? Might not our colonies be better off if we had not touched them if no honey-flow happens to come?"

"Possibly. But I can hardly foresee how this could happen here in Central New York. Tell me what you are driving at."

"Last spring our colonies were storing from one to three pounds a day according to the scale-hive, just prior to May 21; but on the night of that day it froze both the mesquite and the willow, and nothing bloomed to do any good for a month."

"Whew! I thought our late frosts here in

New York were bad enough; but we have had no frost so proportionally late in the season. It is rare that we have to make any effort at stopping swarming here before June 5 to 15; and after that date I have never known a frost to kill any thing except some tender plant close to the ground, on some very low land subject to a white frost on the least provocation. This would not injure any of our nectar-producing flora."

"Well, suppose you did have such a frost just after you had formed your one-frame nucleus with the queen, and one comb of brood and bees taken from a strong colony to keep it from swarming. What would have been the effect on such a nucleus?"

"If such a frost should come the first night after the nucleus was made, it would be injured if many of the bees had returned to their old home; but as the most of the bees so separated will remain with their old queen when she is with them, I should not expect any great loss of brood in the nucleus. If cold freezing weather held on for three or four days the loss of brood might be greater; but, generally, after one of our late frosts it warms up the next day, or the day after, and, during such a short spell of cold weather, the bees 'burn' honey enough to keep up the necessary heat to protect their brood, so no material loss is noticed."

"But what if, on the second day, the bees had killed all the drones just before the young queens went out on their wedding-flight?"

"I never knew of such a thing in all my forty years' experience, and I doubt if such could have been known even in New Mexico — not but that I think your bees did kill their drones, but I do not think they would had you been following the plan as given on the page of GLEANINGS referred to. If I mistake not, your drones were killed while the old queen was in the hive, so it was not necessary for the bees to keep the drones; but *with queens just ready to mate*, drones to such a colony are as a bank account to a man in time of famine, and would be as carefully preserved. In fact, the bees would preserve the drones just as carefully as they would the queen, for just at this time drones would be of as much value toward the future welfare of the colony as the queen."

"Possibly you are right. But how about the ripe queen-cells? I noted that the freeze put a stop to the swarming in 48 hours, and that every queen-cell was destroyed."

"If you raised your queen-cells from your *very best* breeder, the colonies rearing such queens would either be queenless or the cells would be kept away from the laying queen by queen-excluding metal; and, so far as I ever knew, the bees would preserve them through any cold spell at this stage of the season. I have known of queen-cells being destroyed, drones killed off, and swarming postponed indefinitely during such a cold spell in the swarming season; but I never knew of drones being killed in any colony with a young queen just ready to mate, nor of queen-cells being destroyed in

a queenless colony, nor in a colony where the queen was kept away by an excluder during the swarming season. Late in the fall I have had queen-cells destroyed to a greater or less extent above a queen-excluder."

"I see there are some things which I had not taken fully into consideration. I had supposed that, if I had been in the midst of making nuclei to stop swarming, the effect would have been disastrous in a season like the last."

"Of course, such a state of affairs as came through your freeze would put a blue aspect over all apicultural affairs; but I do not see why it would have been any more blue, had you been trying to prevent swarming, than it was when you were allowing the bees to take their own course. It seems the freeze stopped all prospects of swarming, as well as all of the nectar-flow, and changed the tide of affairs generally. Such things as these come to us once in a while; but they should not deter us from striving to do the best we can. We should lay our plans with an expectancy of a good season. You remember the old question, 'What if the flowers never bloomed for fear of the storm?'"

"One more question: What kind of queens would I get, if, instead of going around ten days after the old queen was removed, and, cutting the cells the bees had reared, and giving a different cell, I just let them go on and hatch their own?"

"The first thought just here is not what kind of queens you would get, but what kind of swarming *rumpus* you would have. It would be ten times better not to try to stop swarming than to allow the bees to keep those cells they would rear after the queen was taken away. I know you could *try* to cut all the queen-cells but one; but it would be far easier to go through the hive in a hurry, cutting *all* cells, and then giving a cell from your best queen. This would save hunting some perfect cell the bees had reared. In shaking the bees off the combs so as to find *all* the cells, always remember that *not one single cell* which has been so shaken can be depended on to give a perfect queen; therefore, unless you clip off the one cell before you shake the frame, you have no business trying to save any queen-cells from that hive."

"But if I should see fit to clip off the cells before shaking, and ignore the question of breeding up to a higher standard of bees, would not such queens be good prolific ones of their kind?"

"If you selected the most perfect of the cells, they would probably give you fairly good queens; but you would have no assurance just when the young queens from these cells would emerge; while, as a rule, such queens tend toward a deterioration of stock rather than an uplifting of it. I do not see where any thing is to be gained by saving such cells promiscuously reared, either in time or honey; but I do see a great amount of uncertainty which will be entirely avoided by rearing your queens from your best

stock, and having them ripen just at the time you will be likely to need them for use."



While you are making money at keeping bees why not make all you can? It can be done. Better bees, good management, short cuts, profitable marketing, etc., will help to do it.

Supplies are too high in price to tolerate poor colonies in expensive hives. The remedy is hardly "cheaper" hives but better bees. A poor colony in a "cheap" hive will not give as profitable results as a rousing one in a good hive.

The handling of combs individually, and brushing off the bees, is a thing of the past with me. I can accomplish ten times more in a given time by using shallow supers when removing honey from the hives than by taking out and brushing each comb.

With the increasing demand for pure honey, and the many localities that are proving "no more good" for honey production, on account of the clearing of the timbered land, and cultivation, there need be no fear of an overproduction of honey. In addition to this the pure-food laws will help wonderfully in increasing the demand for pure honey, and there will never be produced enough honey if it is rightly distributed. Hence it is also easily perceivable that the prices will be still better in the future. Prospects were never brighter for bee-keeping than now. It is up to the bee-keepers, however, to make the best out of it.

It pays the bee-keeper to go visiting occasionally. Whenever occasion offers, take a trip around to other bee-keepers, and a short stay with them may make you more enthusiastic when at home again. It may also help you to learn many new and valuable kinks that will save you money and trouble or unnecessary labor. There is nothing like "rubbing up against" others of our craft, and it will only make the bee-keeping ties the stronger; for "we be brethren." This may eventually lead to the better organization of bee-keepers throughout the entire country. "In union there is strength." I always feel well repaid after returning home from such trips.

The tendency here in the Southwest is toward the production of more extracted than comb honey. Section comb honey has

been practically a thing of the past for several years; but bulk-comb-honey production has reached vast proportions. There has always been a great demand for this kind of honey. In the first place, the customers knew it was pure honey, and they had the advantage of getting full weight for their money; besides, the price was lower than that of section honey. The disadvantages, however, are the granulation of the contents in the cans later in the season; and as it can not be reliquefied without melting the combs it can not be kept over the season or for better prices, like extracted honey.

HONEY-LABELS.

Labels on all your honey packages will pay. They help to advertise. That's why all kinds of canned goods and other packages—yes, almost every thing nowadays—are labeled nicely, bearing the name of the contents or the article itself with that of the producer or manufacturer, and often other matter, such as directions for using, or calling attention to its good qualities. Still, thousands upon thousands of packages of honey leave the producers without any label or name on them. Try labels. They make the cans or cases look neater, hence help to sell, and do a lot of advertising, thus repaying for the extra trouble in two ways. Tin pails and cans, if not too large, can be covered entirely with a label, while glass and large packages bear only a smaller label. On the labels that I am using are given directions for reliquefying the honey in case of granulation; and below this in bolder type, "We shall try to keep both comb and extracted honey, also beeswax, on hand the whole season, and solicit your orders." This also has a place on our letter-heads, and we have received many inquiries for prices of our honey, resulting in sales later. For putting the labels on, common wheat flour, mixed with cold water, was more satisfactory than any other pastes that I have tried, besides being the cheapest and most readily made. Labels of this kind are very much like an "ad." in a paper. "It may be bought by one customer, but will be read by a dozen others."

CUTTING OUT THE MIDDLE-MAN.

There is less use for the "middle-man" as a business is built up for dealing direct from the producer to the consumer. This has been my object for many years, and it has profited me to deal in this way. The producer should strive to cultivate a confidence between himself and the consumer. Then the customers know that they can depend on getting "a square deal," and they are willing to pay a good price for it. Thus the profits are much larger—both the profits from the middle-man to the producer, the profits which would have gone from the consumer to the middle-man, and generally, also, a little more than this, that the consumer has been willing to pay the producer, all going into the bee-keeper's pockets.

Instead of selling my crop to one or more

large dealers I have preferred to sell to a greater number of people in smaller quantities. As stated before, the extra profits pay me well for this; and, besides, it gives me a wider range of customers. I become more directly acquainted with them, and from these to others, so that the chances for disposing of my annual crop at good prices increase from year to year. If my crop is dumped into the hands of a dealer, a lower price is obtained for it, and that is the last of it. Where it goes and what is done with it after that I never know. On the other hand, I do know, and price lists can be mailed when the new crop is ready. Generally such customers buy year after year, and I avoid the danger of finding the middle-man already stocked with honey from somebody else.

EXHIBITING GRANULATED HONEY.

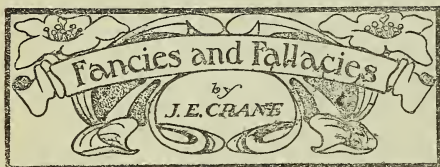
One of the most important features in our apiarian exhibits the past season has been the education of the public in regard to the granulation of honey. The exhibits contained large quantities of honey in the granulated state, and right beside it was the extracted honey in the liquid form. The contrast caught the eyes of the visitors, and no question was oftener asked than "Please can you tell us why *that* honey looks so white?" My answer was always a frank one—"Why, we have this here just on purpose to have you all ask such questions." Then, taking a small jar of each, one of the granulated and one liquid extra, kept handy for the purpose, I would proceed to explain. "You see, this is nice and liquid, just as it came from the hive. Now, that *white* honey here is exactly the same thing that this liquid honey is. Cool weather has caused it to turn hard—it has granulated. Nearly all pure honey does this as soon as cold weather comes, and it is, indeed, one of the best proofs of its purity. If you want to be sure that you are buying pure honey, buy it in this granulated state. Many people prefer it in this way; but those who do not can easily reliquefy it by simply setting the vessel containing the honey on some small pieces of wood in another vessel with water, and heating it until all the honey has melted. It must not get too hot, however, as that spoils its flavor. Hence you see again that this liquid honey in this jar is the same as that white or granulated honey; for we have done exactly what I have told you—reliquefied granulated honey so we could exhibit it in the liquid state, because all of our honey has been granulated for over a month. So you see it is a mistake to suppose that honey is not pure because it has granulated; and then it is very easy to restore it to its liquid state again."

This was harped over again and again, each time bringing out a similar response—"Why, we never did know that, and we are so glad you told us. We'll know next time what to do with it when some granulates again. We certainly appreciate your explanation, and thank you many times for the information."

Then the next lot of persons received the same "treatment." As soon as I began to "explain" to one or more persons others would crowd closer so that one talk served a lot at a time. As soon as this dispersed, another crowd congregated, and so on.

This is given here to show how such an important subject can be handled at our fairs. Others should do the same at their fairs. It is very easy, and the sooner the general public becomes familiar with granulated honey the better for it and the producers of extracted honey. Of course, it makes a person hoarse to talk all day long; but I have often thought I could keep up with the fakirs who made their share by talking; and while doing this I used a good deal of the granulated honey for my throat. It is good for that purpose also.

In addition to talking on the subject it is well to have printed matter for the visitors to take home with them. Many will then read over again some of the things they have learned, and remember them better. This was done at both our State fairs at Dallas and the International fair at San Antonio.



I did not suppose it was any thing so very unusual for bees to store honey under their brood as J. E. Hand would have us think. Why, I have had them build comb and store honey outside their hives and below the entrance when crowded inside.

Dr. Miller's method of supplying bees with water is not only novel, but I believe the most practical of any that has been heretofore described. Those who have never given their bees water have little idea how much they will take when it is convenient to the apiary in a sheltered place.

"How long does it take a colony to discover the loss of a queen?" Stray Straw, Dec. 1. Dadant says, "After within an hour," and the editor's opinion is that it seldom takes longer. Yet I have had one or more cases where a queen was taken away, and, so far as I could judge, the colony did not discover its loss till the brood was too old to rear another, and this in the spring of the year.

I am much interested in ventilation of beecellars. Last winter my cellar was for a considerable time up to 60°, but with a large opening into a chimney with a good draft. Most colonies came out strong. This winter so far the temperature has been up to 55°

most of the time. Only once have I seen it as low as 45°, and then for only a short time. This morning, with a temperature outside at 4°, the thermometer in the bee-cellar stands at 48°. I have a feeling that it is not very objectionable to have the temperature rather high the fore part of the winter.

The statement of the Chicago *Record-Herald* in regard to the present status of the liquor-traffic is of interest. *Harper's Weekly* estimates that at present one-half of the territory of the United States is under prohibitory law, either through State or local-option laws. Prohibition a failure in Maine! So it was claimed for Vermont, so that, after nearly or quite fifty years of prohibition, our State changed to local option; and although most of the towns of Vermont refused to license this infernal traffic, yet for the first four years under local option crime has been more than twice what it was the last four years under prohibition.

I am glad GLEANINGS calls attention to the danger to our country from the destruction of our forests. The American people are a reading people; and if all our papers, magazines, and trade journals call attention to the danger ahead it would seem as though the evil might to some extent be averted. A bee-keeper in a nearby town has bought a large tract of forest land near his home to preserve the basswood for his bees. I believe the investment is a good one. By gradually cutting out undesirable varieties of trees, and allowing the young seedling basswoods to grow, in time he would have not alone good pasturage for his bees, but also a fortune in his hundred acres of basswood forest.

Professor Cook, in his interesting enumeration of the enemies of bees, Dec. 1st, speaks of that very little bee-moth with a very great name, "*Ephestia interpunctella*," saying it will be little feared by any bee-keeper worth the name. Well, it isn't so bad as it might be; but where, after a bad season and heavy losses, such as sometimes occur, and we try to keep the combs over for two or three years, and these little scamps get into them, they are likely to do a good deal of harm. One of the worst counts I have against them is that the larvæ seem capable of withstanding almost any amount of cold without harm, while the larger moth larvæ are always killed in our bee-houses during the winter.

I believe Mr. H. A. Sackett's idea of covering sections of honey with transparent paper is a new idea of more than usual value. For more than half a century the New York markets have been partial to honey put up in glass, while in Boston it must, to bring highest prices, be in paper cartons. Now, here we have a compromise—honey in paper, but transparent, and which answers for glass. It also keeps honey from dripping, which alone should recommend it. I wonder if tinted paper would make honey look as

attractive as tinted mosquito-netting improves a basket of peaches when spread over them.

R. F. Holtermann says, p. 1494, "If I had honey-dew once outside of a hive I would keep it there." Hold a moment, my friend. I want to tell you something. That honey-dew is worthless—yes, worse than worthless—to sell for honey for food. I should not want to sell it even to the bakers; and as to making vinegar, it will be honey-dew vinegar, and you had better not sell that. Some twelve or fifteen years ago we had a season here in which the bees the last of August and early September filled their hives almost solid with honey-dew (insect) honey. Of course, I lost heavily the following winter, and had the next spring thousands of pounds of this dreadful honey-dew out of their hives. What did I do with it? Why, I just saved it carefully and fed it in spring for several years to colonies that were short of stores, or for stimulating brood-rearing. I don't see but it was worth as much as other honey for that purpose.

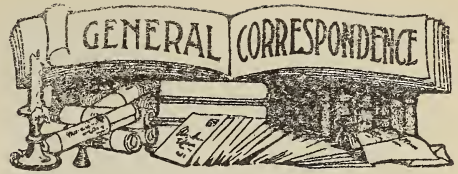
All honor to Gov. Frank Hanly, A. I. Root, and a host of men and women who are fighting to overthrow the liquor-traffic. For many years they have been the butt of ridicule for politicians, saloon-keepers, and fools; but the tide has turned, and now half of our country is under wholesome prohibitive laws. Soon it will be very respectable to be on the side of temperance. Already saloon-keepers are tolling bells as they close their saloons for good, and I have read of one who actually committed suicide, as the outlook for his business was so bad. The strongholds of the enemy are falling thick and fast.

Well, what has all this to do with bee-keeping? Just this: When the hundreds of thousands or millions of women and children who now go hungry because of this wicked traffic shall have bread enough to supply their wants they will want honey to go with it, and there will be money enough to buy it. There will then be no lack of market for all the honey we can produce, and at good prices too. Shall we not discern the signs of the times?

ANOTHER BEE-PRESERVE.

PRESIDENT ROOSEVELT has just signed a proclamation which will have the effect of creating the Verde National Forest. It is situated in Maricopa and Yavapai Counties, Arizona, on the west side of the Verde River. It has been deemed wise to set aside this land with a view to protecting the flow of water in the Verde River. It has been indorsed by the Reclamation Service. The "trees" are said to be valueless by lumbermen; but bee-keepers are probably well satisfied with them, seeing they are mostly nectar-yielders of no mean order. It is also probable some valuable timber tree will be found to thrive there, very likely one of the eucalypts.

W. K. M.



QUEEN-REARING.

Should the Honey-producer Rear his Queens or Buy them? Using Extra Cells from Colonies that Cast Swarms only Perpetuates the Swarming Tendency.

BY E. W. ALEXANDER.

Frequently I am asked whether it pays a producer to rear his own queens. This is a rather hard question to answer, for so much depends on the ability of that producer, and on his experience in rearing good queens. Many circumstances also have a bearing on the subject, such as the number of queens required annually, the kind of honey produced, whether comb or extracted, the time the surplus is secured, and the liability of the young queens mating with undesirable drones. All these circumstances and many more should be well considered before the producer decides to rear his queens. If he has but few colonies, and is anxious to learn all he can about bee-keeping, without any regard to the amount of surplus he may secure, then I would advise him to purchase a good breeding-queen and learn as soon as possible how to rear choice queens. In that way his experience will be worth much to him as long as he continues to keep bees.

One of the worst troubles in rearing a large number of choice early queens here at the North is our cold backward spring weather. We use about 400 young queens a year in our apiary, and have tried many times to rear them during the latter part of May and fore part of June, so as to have them laying about June 10; but it is almost impossible to rear so many good queens at that season of the year. If we wait till the latter part of June to rear them, then the bees from these queens are of but little use as honey-gatherers until after the best of the harvest is over. So we find it much better to pay considerable money each year for our queens instead of trying to rear them.

About the first of December we gave a noted queen breeder our order for 400 queens, to be sent us between the 1st and 20th of June next. It requires time, bees, skill, and honey to rear good queens; and when they can be bought for from \$65 to \$75 per hundred, and extracted honey is worth 7 and 8 cents per lb. by the carload, it does not pay to sacrifice much surplus in order to rear queens.

When the ordinary honey-producer attempts to rear his queens he is very apt to make some serious mistakes, partly through ignorance and partly through a lack of time

to give this part of his business the close attention it requires.

If he would procure a good breeding-queen and rear all his queens from her, then weed out and destroy all small inferior queens as soon as they hatch, he might have choice queens without much expense except for a part of his time, and a certain per cent of his surplus. There is quite a difference of opinion as to the necessary amount of bees it requires to rear choice cells and queens. Some claim it can be done with but few bees; others want strong colonies to produce choice cells. I know we could never rear queens that would suit us unless we used so many bees in rearing our cells that it would make a sad inroad on our surplus honey.

The most common and the worst mistake that can be made in rearing queens is saving the natural cells and virgin queens from colonies that have cast natural swarms. I have heard this method recommended by men who were considered quite good authority, and it seemed as if I could not keep still and listen to them. We spend valuable time at our conventions in discussing various ways for preventing natural swarming, and we frequently see long articles in our journals from noted writers recommending certain methods to prevent it. Almost daily during the summer season we see bad results in our apiaries from excessive swarming, and then so many will do the very thing of all things that will perpetuate the desire to swarm, by saving cells and virgins from the colonies that are the first to swarm; and invariably when this objectionable method has been practiced a few years a strain of bees will be developed that is ready to swarm both in season and out of season. Nor is this all; for a great step backward is taken, and the bees from the first will begin to degenerate, and part of their yellow color will be lost; and the bees themselves being crosser and more irritable, they fail to gather as much surplus, and they become more nervous in winter. In a few years the apiary will have degenerated until it is of but little value. It must then be built up again with good stock.

In view of these facts do not take such a step backward as will bring only loss, trouble, and disappointment. When a colony has many valuable traits, send its queen to your queen-breeder, and write him, describing all those good points, and request him to rear the queens from her unless he may have a still better breeding-queen. In this way the choicest of queens may be reared from the best stock, and improvement can be made along the lines most desired.

As I look back I find that the seasons when we received our largest surplus have been, without a single exception, the ones following the year when we reared our queens from some special queen whose colony had given us an unusual amount of surplus the previous summer. It requires only four or five years of careful selection to make a great change in bees in their honey-gathering qualities, and in their disposition, until they seem

like a different race of bees. The color is one of the quickest of all points to show improvement, and the tendency to swarm can be reduced to a surprising extent; but special care must be taken to select the best standard. Nor is this all. The drone-mothers must be just as choice as the queen-mothers. You must rear all drones from as choice queens as you rear your queens from. In other words, drones must be developed the same as the queens. This may seem like an unnecessary amount of trouble; but there is little of value in this world that does not cost labor to acquire.

There are many bee-keepers who might make great improvements in their bees if they would only start in the right way. They seem to think that, if they buy a breeding-queen once in a year or two, it is about all that is necessary; and if her colony swarms they will try to save some of the queen-cells, and then think they are improving their bees. Such a line of management is no improvement; and if that is the best that can be done, then it would be better to buy all the queens from some one who is doing better. The whole subject turns on this point: The best queens, bought or home-reared, are none too good, and the aim should be to make them still better with each succeeding generation.

Delanson, N. Y.

[This question of using swarming-cells for the rearing of queens for the production of honey is a very important one. If it is fact, that the practice accentuates the swarming tendency in our bees, we may well stop and ask the question, Does it pay? We should be glad to hear from our subscribers who may have been gathering data on the proposition.—Ed.]

THE SIBBALD WAX-PRESS.

A Combination of the Hatch and Hershiser Principles; a Description and How to Operate.

BY R. F. HOLTERMANN.

At the annual meeting of the Ontario Bee-keepers' Association in Toronto, and by special request at the Brant District Bee-keepers' convention, Mr. H. G. Sibbald, Claude, Ontario, gave a description of a wax-press which was considered valuable by those present.

It would be necessary to go through all the stages of wax-rendering and to recount all the thoughts, time, and material that have been expended upon improving the methods of rendering wax, to parallel in magnitude the enormous amount of wax and the sums of money which have been and are being thrown away in the imperfect rendering of old comb, cappings, and the like. This amount is, perhaps, more than doubled by money which has been worse than thrown away by allowing the wax-moth to destroy comb upon which the bees have perished.

Let us profit by the past, and at least use some of the most up-to-date methods obtainable.

For even a small bee-keeper, a press of some kind, as over the old methods, will soon pay for itself. There is practically no economic method of rendering without it. Machines defective in one locality or under one condition may answer well in another.

For instance, in a hot climate, or where wax-rendering can conveniently be left until hot weather, the method of heating the wax in a vessel on the stove and then pressing in a machine not being heated on the stove, is perhaps the cheapest machine and the most rapid and economic method, and will answer well. But where the spare time is in the winter, and the operating-room can not be kept at a very high temperature, the wax at any exposed part or among the cloth itself soon gets cold, and the wax thus confined results in loss.

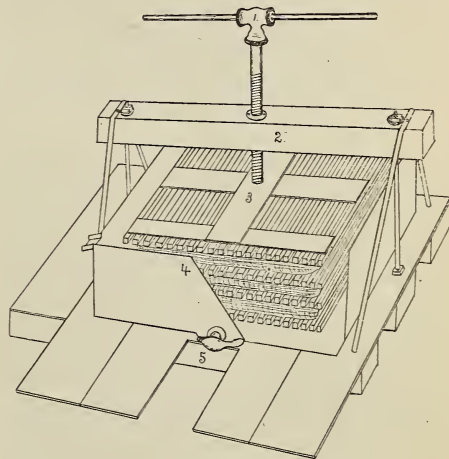
In the Hershiser wax-press we have a machine which remains on the stove and has heat applied to it while in operation, and it can, therefore, be operated in a comparatively cold room; but it takes considerable time to heat the machine and its contents. From my experience each of the above machines will do good work, and, on the other hand, with them, as with any machine, wasteful work can be done.

Mr. Sibbald, who was for two years president of the Ontario Bee-keepers' Association, and who is a successful, intelligent, and extensive honey-producer, and who has in the neighborhood of four hundred colonies of bees, and is a prize-winner in both comb and extracted honey, and who is one of the six foul-brood inspectors of the province, stated that he had designed the press, availing himself of the best thoughts of other inventors. He had arranged the machine so that any one who had a Hatch-Gemmell press could use the most expensive part of it in the new design.

In describing the machine, Mr. Sibbald states:

"The sketch makes the principle of the press pretty clear. To operate, a common stove and boiler may be used for melting the

is folded over and pinned. The form is then taken out and another set of slats placed upon the cheese-cloth and contents just prepared. The form is again placed on the slats; a cheese-cloth is again spread over the form, and two inches deep again filled into the form, when the cloth is folded over and pinned as before. Form 6 is again taken out and the operation again repeated, and the last cheese is made and the form removed, when a top set of slats is put upon the pile.

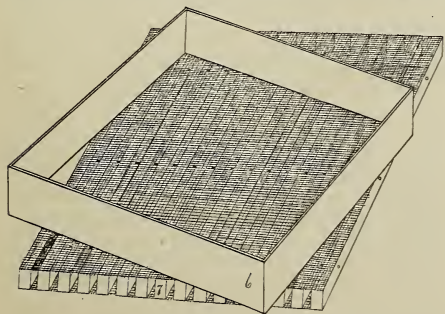


The tank (4) is then pushed back until under the screw, which is then tightened. The hot water from which the melted combs or slumgum has been skimmed is then poured into the tank (4), filling it up to within half an inch of the overflow lip, and so as quite to overflow the slats and cheeses. The tank is covered by means of two boards so as to keep all warm, and the screw is given a few turns down. This is left for a few minutes while the boiler is again filled. Continue the turning-down of the screw every few minutes; loosen it occasionally, and allow hot water to soak back into the cheeses and thereby wash out the wax, when the screw is again tightened.

By the time the next boilerful of old comb is nearing the boiling-point the wax is overflowed or skimmed off by either adding more hot water from a second boiler or by tipping up the opposite side until the wax which is, of course, on top, is all run off.

The water is next let off from the top in front, and used for the next boilerful. Being still quite hot, time and heat are saved. Now loosen the screw, draw the tank forward until clear of the top-bar (2); take out the three top sets of slats and refuse. Put in form (6); spread a cheese-cloth over the form as before, and proceed to refill the machine.

It will be seen that the system of gravitating the beeswax away from the material pressed, and away from grates, etc., can readily be applied to some machines in use. I might add that, in heating old comb, cappings from comb, or the like, if there is any honey slightly fermented among it, the



old combs or slumgum, which, when thoroughly melted and about to boil, is dipped or skimmed off, and poured into form 6, which has already been placed upon the bottom set of slats, and is covered by a cheese-cloth. When a depth of about two inches has been filled in the cheese-cloth the latter

boiler or other vessel will boil over very readily, and may result in the destruction of the building. Where such is not the case the heated mass will not boil over so readily; but, just the same, *never leave a stove unattended that has such material upon it that is boiling or may come to the boiling-point at any moment.* I have known of at least two buildings being destroyed by fire in this way. Brantford, Canada.

THICK SYRUP VERSUS THIN FOR WINTER STORES.

Why a Thick Syrup is to be Preferred.

BY ALLAN LATHAM.

I have been requested to express my views upon the subject of feeding thick syrup late in the fall after I have first read Mr. Alexander's article on page 29.

There is scarcely a statement in that entire article which does not meet my unqualified approval, there being but one thing which I should wish to modify. I question the wisdom of feeding so large an amount as 14 lbs. of dry sugar to each colony unless the combs are very empty.

As eight or ten pounds of stores will carry a colony to the time of frequent spring flights, it seems scarcely warrantable for us to put an unnecessary amount of this foreign feed into our hives and thereby lay ourselves more open to the charge of sugar-fed honey. We can truthfully say that a colony of bees will, beyond all doubt, take care of ten pounds of sugar syrup which is fed late in the fall, even though they have abundance of honey beyond this; but there is too much likelihood of syrup becoming a part of future surplus from a colony which has at the time of the feeding a large store of honey, if more than about ten pounds be fed. Let us err on the right side rather than on the wrong side, if we are to err.

I believe in feeding thick syrup to bees for their winter stores, rather than thin, and feeding this syrup late. Why? Well, for two or three reasons—reasons which the editor has suggested in part in his footnote to the article of Mr. Alexander's. To feed thin syrup means a loss of both syrup and bee energy. The thinner the syrup, the greater the loss. Even with the proportion mentioned by Mr. Alexander there is a loss; and instead of there being 21 pounds of thick syrup in the combs as stores after feeding 14 pounds of sugar made into the 2-to-1 syrup, there will be but 17 (or at the most 18) pounds of syrup. If these same 14 pounds of sugar be fed in the form of a thin syrup, the resulting stores will not exceed 14 lbs. of thick cured syrup, and they may fall even below 14.

When a thin syrup is fed, the bees get greatly excited, and will consume much syrup in the generation of useless heat; at the same time they will use up much of the life energy which they possess.

It is my honest belief that the idea that bees must have an inverted sugar for their

winter feed is sheer nonsense. The fact that bees invert sugar when fed to them thin led to the belief that the inversion was essential before the syrup was fit food for the mature bee. Where, may I ask, is the proof, or even logical demand for such a conclusion? Too many times have many of us utterly disproved that conclusion. My experience in the wintering of baby nuclei has offered me abundance of proof, for my best success has always attended the feeding of thick syrup late in the fall. The absurdity of the claim is seen again when we consider that one of the best of winter feeds for safety is a cake of sugar laid over the frames. This cake of sugar must be of the non-inverted kind, too, for otherwise it is likely to get thin and run down upon the bees to their ruin.

That the need of using an acid for the purpose of inverting the sugar fed is lacking so far as rendering the syrup fit food for the bees I have no doubt; that it is entirely lacking as regards the rendering of the syrup proof against crystallization I feel less certain. Personally, during all the years I have kept bees, and with all the winter feeding which I have practiced, I can not now recall one single instance in which the syrup crystallized in the combs. If it did so, it was to such a small extent as to escape my notice. I never use cream of tartar or other acid.

I have, however, never done much feeding of syrup as thick as 2 to 1. I have always found the bees little inclined to take care of syrup thus thick. Fed as Mr. Alexander advises—warm, and right under the cluster—it may go all right; but fed in nine-tenths of the various forms of feeders would result in only about one-tenth of the syrup being taken by the bees before the syrup got cold. After it was cold they would pay about as much attention to that syrup late in the fall as they would to ice-water. It is so thick when cold that the bee can scarcely draw it through its tongue, and it has no patience to stay away from the warm cluster long enough to get a load of syrup. No enthusiasm is aroused, and the feeding lags. If fed a trifle thinner, the bee loads up more quickly, and just enough enthusiasm is aroused to warm up the hive and make that syrup go into the combs with a rush. I find that a 5-to-3 proportion brings about such a result.

If fed 2 to 1, unless the bees take the syrup up immediately there will be more or less crystallization over the surface and along the edges, resulting in loss and bother. My method of feeding is by means of an atmospheric feeder, simply a fruit-jar or tin can inverted full of syrup upon a piece of thin board, and a wire nail placed under the edge of the can—a method too fussy in a large apiary, but excellent in a small one. Four quarts thus arranged in an empty super right over the brood-nest will go over night, or before the next four quarts are fed the following night. Twelve and a half pounds of sugar made into 20 pounds of syrup will be taken in two feeds, and will result in about 15 pounds of ripened stores. If fed

right after the last brood is out of the cells this syrup will be mostly stored right where it will do the most good—that is, right about the brood-nest and within it. It will be the feed of the bees till spring arrives with its days of frequent flights. Less than that amount is enough unless the hives are very light.

There can be no question that we can winter our bees better upon sugar than we can upon ordinary honey. I had that proved last winter when my observatory hive which I had kept bees in continuously for nearly four years became depopulated. In the fall of 1906 it got enough honey to winter on, and I did not feed it with syrup as usual. The honey killed those bees, or, rather, the pollen in and about the honey. The winter was not severe, whereas three winters ago that little colony wintered through one of the hardest winters we have had for many years—the winter when there was such a frightful bee-mortality. Sugar syrup took them safely through.

Yet I feel that we should be slow in advocating this feeding of syrup except as a necessity. In a locality of mild winters, where bees have occasional flights, it is doubtful wisdom to go to the labor of substituting syrup for honey in our hives—especially as it will be difficult to defend the practice upon the ground of necessity, and we shall lay ourselves liable to a serious misunderstanding. It is difficult to convince the public that we are honest so long as we open up a chance for the public to spy a possibility of dishonesty.

For our Canadian friends, and also those in the far north of our own country, to use syrup as a regular winter food is an act so easy to defend upon the ground of necessity that no one should condemn it. Possibly for others of us further south to feed a few pounds of sugar just to get the bees through the first of the winter, or even to early spring, might be easily defended; but for one of us to go to a hive which has already 20 or 30 pounds of honey in it, and stuff that hive with nearly as much syrup, is decidedly wrong. We are tampering with honesty there, or at least playing with fire. Except in this one particular, as I stated above, I can agree with nearly every word in the article on page 29.

Though it may not be according to the teachings of years, late feeding of thick syrup is the thing, and not early feeding of thin syrup, if it be simply a matter of furnishing the colony with winter stores. If the purpose be other than to furnish winter stores, then it's another story, and that story I will not tell here.

Norwich, Conn., Jan. 8.

[In these days of the effective working of our national and State laws against all forms of adulteration of food stuffs, we have no fear that any syrup will be fed for any other purpose than to supply a winter food or to stimulate brood-rearing in the flying season. Sugar syrup, even if fed thin, and inverted,

is, by our modern methods of analysis, very easily detected, and no one, even if he be disposed to be dishonest, would dare take any chances. Bee-keepers are glad that it is so, for their product (honey) is of such superior merit that they do not need to cheapen it by the addition of an inferior sweet.

The question of a thick *versus* a thin syrup is still open for discussion. We should be pleased to hear from a good many who are in position to offer facts.—ED]

HOW SWARMS CHOOSE A LOCATION.

More Observations Confirming Those of G. C. Greiner.

BY J. C. BALCH.

The article by G. C. Greiner, page 1507, of the Dec. 1st issue, is in line with my experience. I remember that, in the winter of 1895, in Kansas, I lost quite a few colonies of bees. The combs were cleaned of dead bees, and the hives left on the stands with the entrance open. In the swarming season there were five swarms that came and took possession of empty hives in the apiary, and I know they came from parts unknown, because my bees were Italians, and those were blacks. The swarms all came in the forenoon, between 9 and 11 o'clock. I would see a few bees going in and out of a hive the day before they came, and the quantity of bees increased in the afternoon till there would be almost a pint of them around the hive, very restless, and busy going in and out, and, I think, going to and from the hive to the swarm and bringing other bees with them; then when night came they all went away; and the next day, as soon as the dew went off, and it began to get warm, the swarm came and went right in at the entrance. They did not stop to cluster, but just tumbled over each other in getting into the hive.

I once noticed some bees working busily around an empty hive all day. The next morning a neighbor came to my house a little after sunrise, and said he had found a swarm of bees. I went with him and hived them for him. They were about 30 rods from the apiary; and after hiving the swarm there were no more bees working around that empty hive. I am satisfied that, had he not found them, they would have hived themselves that forenoon in my hive.

Two years before that, there were three stray swarms that came to my apiary and went into empty hives in the same way. They always go into hives with combs in them the first year. It was into my extracting-supers they went. I had set them out in the apiary, preparatory to putting them on the hives. There was a pile of five or six supers. They were not set up perfectly true, and so left an entrance so the bees got in. Absconding swarms seldom go into a new hive unless there are three or four empty combs in it.

Ferndale, Wash., Dec. 11.

WINTERING IN A SLIGHTLY DAMP CELLAR.

A Good Record; Disturbances Seem to Do no Harm.

BY WM. L. COOPER.

Having read with much interest Mr. Alexander's article on the necessity of quiet in an ideal bee-cellar, I think that a short account of the successful wintering of bees in a cellar which is by no means ideal may be of interest to some readers of GLEANINGS. My bee-cellar, which has been in use for that purpose for six years, is beneath a two-room dwelling-house. I never thought it a particularly damp cellar; but as roots do not dry out in it, it would not come under the definition of a dry cellar as lately given in GLEANINGS. Every day in the course of the winter, and often several times in the day, I am down in the cellar with a lantern, getting roots for the cattle. At least once every day the root-pulper is at work there—a thing not conducive to quiet. I admit that I was very nervous as to the effect of the pulper on the bees, but the results have proved satisfactory.

Last year seventy colonies went into winter quarters here, and the same number came out, apparently nearly as strong as they went in. Of nine colonies weighed, the lowest honey consumption was 5 lbs.; the highest, 14 lbs.; the average, rather over 8. The year before, 42 colonies were wintered without loss. In the six years, I have lost four colonies in this cellar, in every case from want of stores. The temperature varies from 42 to 47. There are three outside ventilators, and a pipe which passes through the floor into the stovepipe of the room above. One or more of the outside ventilators are closed in intensely cold weather, say from 30 to 40 below zero, especially if there is a high wind. These ventilators are wooden pipes four inches by eight; the one into the stovepipe is a four-inch galvanized-iron pipe.

The hives have their summer entrances, and are raised from the bottom-board at the back by two $\frac{3}{4}$ -inch blocks. In bringing bees up from the yard, a piece of lumber is put in the entrance to prevent bees flying. On two occasions I forgot to remove this from a hive, but they seemed to winter about the same, so I suppose so much ventilation is not essential.

Apparently it is universally agreed among bee-keepers that brood-raising in the cellar is detrimental. My general rule is to set bees out on the first suitable day after April 15, and I generally look over every colony as soon as possible. I should say that, out of every ten colonies at this date, one will have a good deal of sealed brood and a few young bees; two will have a little sealed brood; five will have more or less unsealed brood, and two with eggs. I do not recollect ever finding a queen-right colony without eggs when taken from the cellar. It seems to make no difference what date bees are taken out after April 15, brood in something like the proportion mentioned will al-

ways be found. I have been unable to see that the vitality of the colony is seriously affected by this cellar brood-raising.

Just after getting bees out last spring we got a warm day. I had looked over ten colonies when it clouded over, and for two weeks after that it was not fit to open a hive. I was very sorry that I had meddled with those colonies at all. Yet when I next examined the apiary every one of the ten had progressed in brood-raising, proportionately to their strength, more than those which had been left alone. Was this a coincidence, or had the stirring-up actually stimulated them?

A FURTHER REPORT ON THE ALEXANDER PLAN FOR WEAK COLONIES.

Last year you published an article by me describing my failure with the Alexander method of building up weak colonies in the spring. The bees did not fight, but the lower colony simply declined to assist the upper, and itself did not do well. This year I tried again. In one case it was a brilliant success, both colonies building up in a way that seemed almost incredible. In four others it failed again, and in three out of these four I have placed the cause of failure—the queen in the weak colony was "no good." With Mr. Alexander's careful and methodical weeding-out of all poor queens this would not occur; but I suspect it accounts for many of the failures reported. Still, the fourth case remains a mystery to me. The lower colony was very strong, and there was no fighting; but two weeks after placing the weak colony on top there were just about as few bees in it as when it was first put there. The lower bees did not even help themselves to the unsealed honey, of which there was quite a lot. I had intended to raise a frame of brood and see if that would draw them up; but, finding a queenless colony, I transferred the top queen to it, and she did excellent work there.

Cannington Manor, Sask., Can.

[The cellar here described we should say is not necessarily a bad place in which to winter bees—quite the contrary. The dampness present is rather in its favor than otherwise. A place that is bone-dry is not as good as one where there is a reasonable amount of moisture. If a pudding is to be judged by the eating of it, this cellar is a good place in which to winter bees.—ED.]

THE AMERICAN HIVE SYSTEM IN EUROPE.

ONE of the best bee-journals published in Germany is the *Deutsche Illustrierte Bienenzeitung*, published in Leipzig by C. F. W. Fest; yet in the number for January, Pastor Sträuli makes a strong plea for the American hive system. Some of the best bee authorities in Germany write for this journal—for example, the two Kranchers and Weygandt, so it can not be said that it is not representative of the country. In the same issue is an answer by Dr. Kuckuck himself to criticisms of his book on parthenogenesis by Dr. Butteler-Reepen, of Oldenburg.

W. K. M.

MAKING HIVES BY WIND POWER.

A Home-made Windmill and Saw-table Constructed Wholly of House-building Material.

BY T. P. ROBINSON.

I never intended to be a bee-man. I began to keep bees when I was 16, caring for father's bees because they always stung him so fearfully. I was as poor as a church mouse when I was 21, and I began to keep bees for the money there is in them. Now I market many thousands of pounds of honey annually, although the business with me is but a side issue.

When my apiaries, in recent years, amounted to hundreds of colonies I found that, to buy factory-made hives, was a fearful drain on my bank account. Being a born mechanic, and a good practitioner of mechanical art, I determined to turn this talent to account in manufacturing my hives. It was a cheap matter to construct the saw and table necessary for making the hives; but the power to turn the saw was quite another thing. It would have been an expensive item in my case to install any of the artificial powers now in vogue. There was no water that could be "harnessed," but I was fortunately located on one of the great prairies of Texas where there is no obstruction to the strong steady winds.

I knew that there were hundreds of thousands of horsepower going to waste daily on my premises, which, if "harnessed," would do all the hive-making that I should want.

I therefore constructed a wind-motor which is a marvel of economy, simplicity, and power. I proposed to construct this out of house-building material, without damaging any of it over 10 per cent for house-building purposes, confining the damage to small items.

I procured a heavy 2½-inch white-metal gas-pipe nearly six feet long for the axle of the big mill. I purchased 8 2×4-inch scantling, 12 feet long, for the trestle and for the spokes of the wheel. The trestle for the mill is stationary, each part being braced with scantling. The horizontal scantling are bolted to posts that are buried deep in the ground. I made iron bearings for the bolsters of the trestles, in which the axle revolves. In the front I put on a two-foot pulley,

securing it to the axle by means of a pin. Back of the big windwheel, and out of view, I placed a solid wooden pulley, secured to the axle, which is used for a friction-brake.

The windwheel is of simple construction, as shown by the photograph. I used twelve-foot scantling for the spokes, put two arms across on each end of the scantling. Ten-foot corrugated roofing was cut in two, making sails 5 feet long and 26 in. wide. These I secured to the spokes and arms by means of screws and nails driven into the scantling at the edge, and bent down over the metal.



T. P. ROBINSON, BARTLETT, TEXAS, A BEE KEEPER WHO SAWS LUMBER FOR HIVES ON A HOME-MADE WIND-POWER SAW.

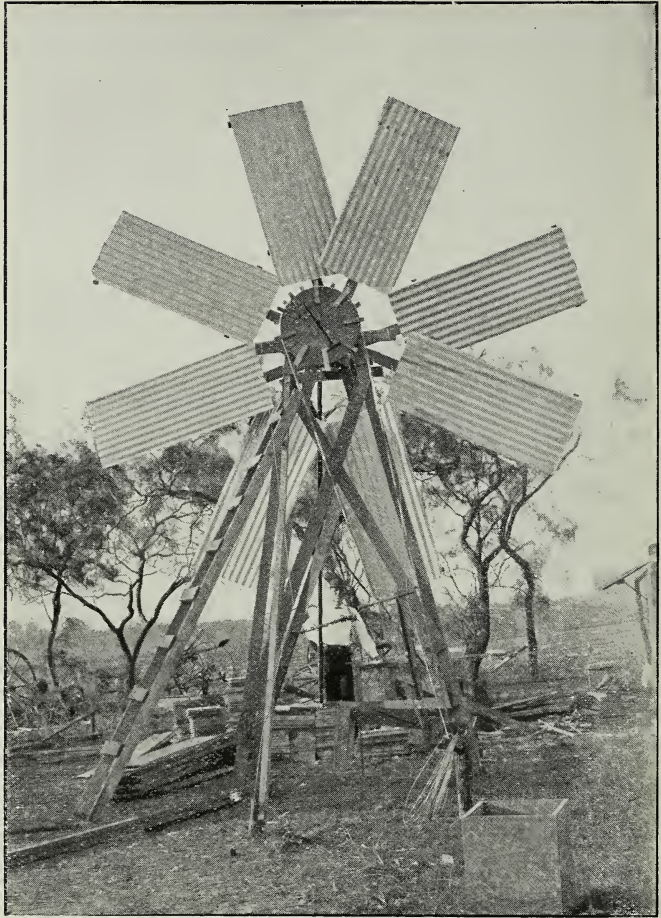
To make the frame-work more secure, it was guyed to the ground with telephone wire. The mill is nearly 20 feet high to the top of the sails. The power is transmitted by means of a rope belt from the pulley on the main axle to a pulley on an 18-foot $\frac{3}{4}$ -inch gas-pipe used for a line-shaft. On the opposite end of the line-shaft a two-foot pulley is placed under the saw-table, on which a belt 2 inches wide is run to the six-inch saw. The table has a top $3\frac{1}{2}$ ft. by 4 ft., on which is placed a movable top, set perfectly square in every direction with the saw. The top of the table, instead of the lumber, is fed to the saw in much of the work. This guarantees square cuts in every direction. The saw and mill are geared 40 to 1, and I have seen the mill clip off over 100 revolutions per minute, giving a rim speed on the saw of over one mile a minute. At this speed the only trouble the operator has is in getting boards to the saw fast enough.

The whole affair is set north and south so as to utilize the prevailing winds. It fronts south, but it runs just as well with a north wind. Of course, it will run backward; but all the operator has to do is to cross the driving-belt.

The photograph of the mill shows the piles of cut hives at my feet, showing the results of an hour's run. In another photo are shown a few supers and hives nailed and painted, as a product of this hive-plant. They are good enough for me.

In another engraving is shown a ten-frame hive complete, every bit of the sawing for which was done by the mill. Notice the construction of the lid. It is a little heavy, but will stand the weather. It can not warp, as two separate pieces above and below are clinch-nailed through and through. The frames are not self-spacing, but are of the regular Langstroth dimension, and therefore interchangeable with the Hoffman frames. The ten-frame two-full-story hive complete, with 20 frames for extracted honey, costs about 60 cts. for material.

The mill or hive-plant complete cost about \$12.00 for material, all told. I did all the



ROBINSON'S HOME-MADE WINDMILL FOR SAWING HIVE LUMBER.

work, made all the pulleys, mandrel for the saw, and all boxes or bearings, etc., here at my shop. The outfit paid for the material the first day it was run. I shall use the material in building as soon as I am done making hives for use. I have no hives or bee-supplies to sell.

Bartlett, Tex., Dec. 4, 1907.

[Any one who has skill enough to make a mill like this will certainly be able to make hives. The whole arrangement is very simple and ingenious, and we see no reason why some of our subscribers of a mechanical turn of mind could not do likewise. The scheme of using corrugated iron for the sails, and then using the material for building afterward, is certainly very unique. We should not have supposed that a mill that could not face the wind squarely at all points of the compass would be a success; but in territory such as our correspondent describes, it evidently does the work.—Ed.]



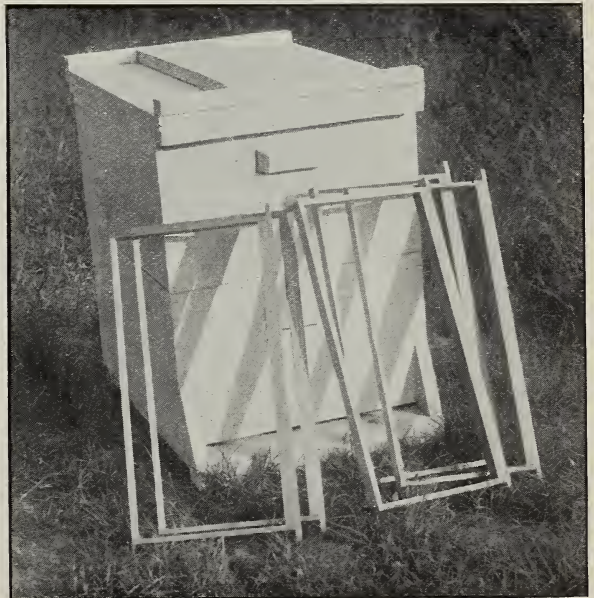
A PILE OF HIVES MADE WITH ROBINSON'S WIND-POWER BUZZ-SAW.

UNCAPPING-BOXES.

Melting the Cappings as Fast as they are Sliced from the Combs; a Rapid Method for Separating the Honey and Wax.

BY H. H. ROOT.

Disposing of the cappings at extracting time is a subject that has been given much thought in the past; but, until recently, the various uncapping-cans and boxes have all been constructed in such a way as to provide means for holding the cappings while the greater part of the honey drained out of them. The dry (?) cappings were afterward melted up for wax. It takes considerable time for even the bulk of the honey to drain out, and so extra boxes, barrels, or cans are invariably pressed into service. Within the last year or two, several producers in California have been devoting their efforts toward an uncapping-box that would melt up the cappings as fast as they are sliced from the



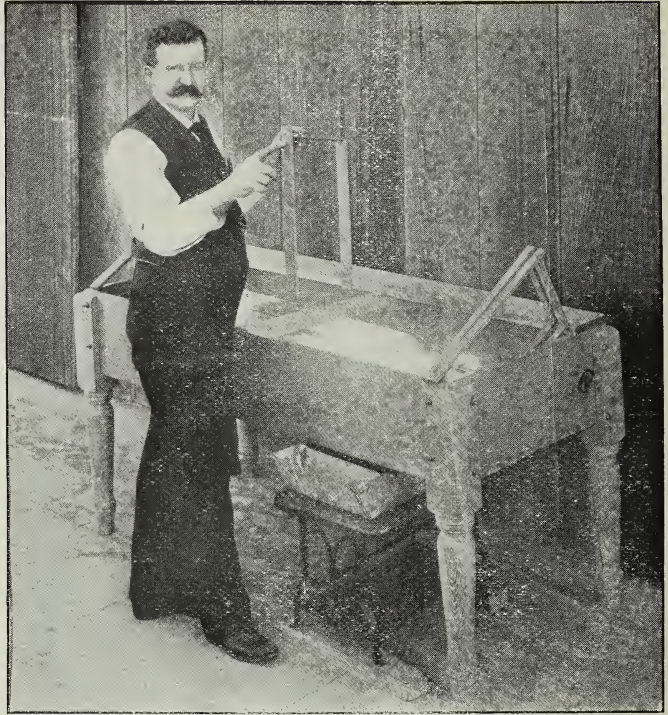
TEN-FRAME HIVE COMPLETE, MADE WITH ROBINSON'S WIND-POWER BUZZ-SAW.

combs, thus permitting the honey and wax to separate readily after being drawn off through a spout into a pail or can. Among those who have been working on the idea may be mentioned M. H. Mendleson, John Y. Peterson, and L. E. Mercer. We intend to present descriptions of the other plans later; but since we have received the engravings of Mr. Mercer's outfit we will describe that first.

Mr. Mercer has been working on this problem for some time, and he has developed an outfit which he has used with a considerable degree of satisfaction. The general plan is shown by the accompanying engravings.

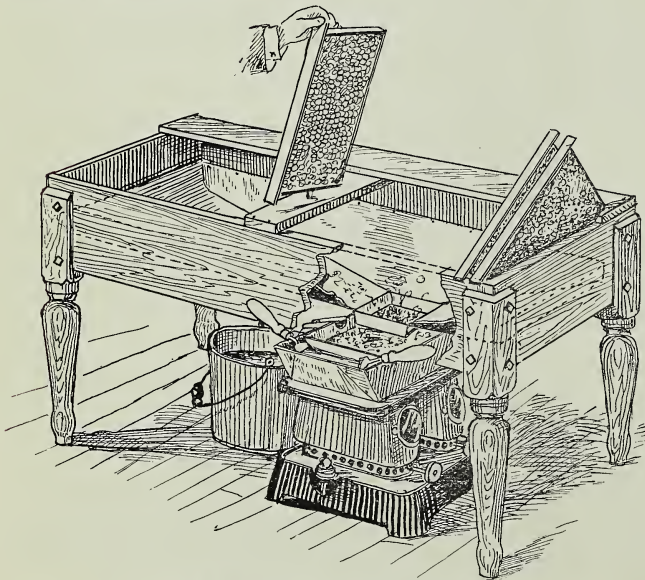
The plan of operation, in brief, is as follows:

The combs are uncapped as in any ordinary uncapping-box; but the cappings, instead of falling on a screen to drain, drop directly on to a tin bottom which slopes down toward an opening near



THE MERCER UNCAPPING-BOX.

The cappings, as fast as they are sliced from the combs, fall down into a hot pan where they are immediately melted. The honey and wax are thus separated.



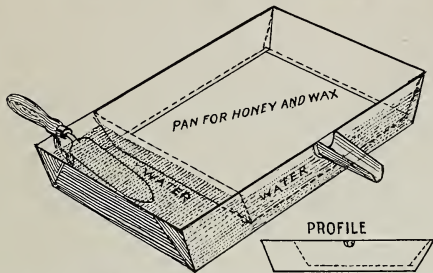
THE MERCER UNCAPPING-BOX.

The stove shown would hardly be suitable. A blue-flame wickless kerosene-stove should be used

one end. The honey with the cappings furnishes sufficient lubrication to keep them constantly sliding down through this opening into the heated pan beneath. This smaller pan is surrounded by water, which is kept hot by an oil-stove, so that the cappings are immediately melted into wax. The capacity is not limited; for, when the heated pan is full, the honey and wax overflow through the trough into a pail, which is replaced by an empty one when full. When the work is done for the day, the wax cakes may be lifted out of the pail in good condition for market, leaving the honey entirely free from cappings.

The details of construction of the uncapping-box are shown

more clearly in the reproduction from the pen-drawing. The oil-stove shown is not the style that Mr. Mercer uses, for he has found that the blue-flame wickless kerosene-



DETAILS OF THE DOUBLE PAN IN WHICH THE CAPPINGS ARE MELTED.

stoves give the best satisfaction. Asbestos rings take the place of wicks, and these are never moved up or down, the supply of kerosene being regulated by a valve.

The large box is five feet long, two feet wide, and ten inches deep. There is a two-inch slant to the tin bottom, so that the cappings will more easily slide into the hot pan beneath. If, for any reason, the cappings should collect in the box in two great quantities, an occasional push with a stick would send them down out of the way.

The hot pan is made double—that is, the arrangement is really a pan within a pan. The inside pan, which holds the wax and honey, is, of course, smaller and shallower than the outer one, and the sides are also more flaring. This gives the hot water a chance to surround the inner pan completely, so that the sides, as well as the bottom, are kept hot. Reference to the small illustration of the pan will make this clear. It will be noted that the outer can, which holds the water, is made enough longer to give a space just the right size for holding two uncapping-knives. This means that the blades will always be hot and clean.

The uncapping-box would not need to be so long were it not for the fact that it is a great convenience to have a rack for holding uncapped combs before they are placed in the extractor. By hanging the combs in the box, the honey that drips from them runs down with the cappings so that there are no extra pails or cans to watch.

Little need be said concerning the advantages of this plan. The cappings are never in the

way, and no bulky cans to hold them are necessary. The wax cakes are ready for market about as soon as the work is done, and no time is spent in rendering. The most expensive part of the outfit is the stove. A two-burner oil-stove of the style mentioned costs about five dollars; but it is a stove that is needed in every home, any way.

DRUMMING BEES OUT OF A LOG GUM.

BY FRED J. CARTAN.

I am sending you a photo of a bee-tree that I found and took to my yard and set up. It is six feet long and filled from end to end with comb, and probably honey and brood. It is curved away from the point of view and does not show the entire length, as I wished to show the bees and their entrance into the tree which can be seen at the lower edge of the cluster of bees.

I am of the opinion the bees have occupied this tree over at least one winter. As the hole was and is now at the top of the hive (or,



FRED J. CARTAN AND HIS BEE-TREE.

This bee-tree was found by Mr. Cartan and the section containing the bees was cut out and moved into his own yard.

rather, tree), I do not understand how the bees could retain the heat during cold weather.

I wish to transfer these bees to hives, and am in doubt as to the best plan. The colony is very large, about twice the size of a strong colony in regular hives, and would do good work if in hive and supers. Can I drum them out into the hive I am using as a super shown in the picture, or should I use Porter bee-escapes? There is a hole in the top of the log communicating with the super. I should like to save the queen, and can save most of the brood by putting the combs into supers on top.

My bees have done well this year. I had to feed through April and May to keep up brood-rearing, and at the first alfalfa flow the hives were running over with bees. The best colonies have 100 lbs. of surplus at present.

Medicine Lodge, Kansas.

[There would be no doubt about your drumming the bees up into a modern hive,

SWEET CLOVER.

**Its Value as Pasturage for Cattle and Bees;
Worth Four Dollars an Acre
for Honey Alone.**

BY FRANK COVERDALE.

[In our last issue, p. 105, we published a report from Mr. Coverdale on the subject of sweet clover. We are glad to place this article also before our readers, since it gives some of his experience in regard to the value of sweet clover from a bee-keeper's standpoint.—ED.]

The steers shown in the illustrations are part of a load shipped to Chicago Aug. 1, bringing \$5.75 per 100. During June and July they were fastened into this 35-acre field in which was a pretty good stand of sweet clover. This ground has been sown to this valuable legume for four years, and it seems to thrive better each year. No one who looks at this pasture and sees the cattle eating it and becoming fat has any doubt about its value as a pasture-plant. Most farmers think I am growing a vile weed; but they say it



CATTLE FEEDING ON SWEET CLOVER.

but you may have to pound pretty hard and continuously for a matter of twenty minutes or longer. If this does not succeed, bore a hole into the bottom of the cavity with an inch auger bit, and with smoke drive the bees upward into the upper box.—ED.]

makes good feed for the cattle nevertheless. When I want to get rid of it after getting other fields started, I guess I shall have to plow up the field.

Sweet clover is certainly a great honey-plant, and this adds very largely to its value to the keeper of bees. It is also the very best clover to sow where a permanent and first-class grazing-field is wanted for dairy cattle, sheep, and hogs. I have not the least doubt of its permanency, because of its luxuriant growth through both wet periods and the drouths. It always furnishes a large quantity of nice green feed until the ground

A SPADE is a spade, and glucose is glucose, even if it is made from corn starch. If glucose is as good as its makers claim it is, there will be no trouble about selling it under the old name—*glucose*.

begins to freeze in the fall. Even after it is frozen the stock do well on it if any is left.

I have 150 colonies of bees near this field, and it is a sight to see it when it is in bloom.

The bees keep on filling the supers slowly with the honey, which is water-white, and very agreeable to most people. For me, this clover has yielded honey every season; but the bees do better on it at times. My neighbors keep some bees, so about 200 colonies work on it annually, and yet the field is worth from \$3.00 to \$5.00 an acre each year for the bees alone. I have made a very close study of this matter.

I think it will not be many years before these bees will have hundreds of acres of sweet clover to work on, and then I expect to see real results. I have seventy acres of sweet clover 20 miles from home, where I never expect to keep bees; for I want only a good rich pasture in this place.

A willow-tree once blew down and broke the fence so that my cattle walked right into my neighbor's hay-field. A ditch extended from my field into his, and the sweet-clover seed had been washed down until it grew along the banks in his field. This neighbor had told me he was afraid it would cover his farm; but my cattle found it that night, and ate it nearly to the ground without touching either the alsike or the timothy.

Maquoketa, Iowa.

[In a letter written later, to Dr. Miller, Mr. Coverdale made the statement that sweet clover is worth \$4 an acre for honey, \$15 an acre as pasturage for cattle, and \$30 an acre for seed, when the seed sells near home for \$10 a bushel. This makes a total of \$49 an acre.—ED.]

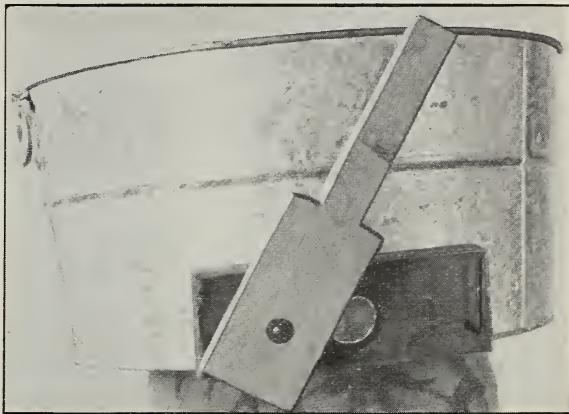
A HOME-MADE HONEY-GATE

BY E. F. ATWATER.

Sometimes we need a honey-gate on very short notice; and, if not near a large supply-house, we hardly know what to do.

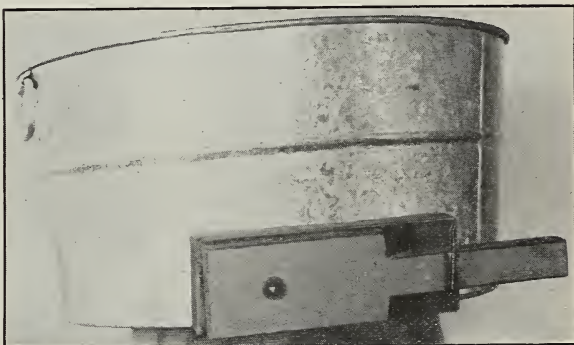
One day in September I made a brief call at the home and apiary of F. A. Powers and was at once interested in his home-made honey-gate. The general construction will be clear from the cut. It is made from 1½-inch lumber, about 4 inches wide. The block next to the tub or tank is cut out accurately to fit, and nailed on from the inside of the tank. On arriving home I needed

another strainer-tub; so I made one with a home-made gate, as shown in the cut. While this worked very well on honey at ordinary temperatures it was inclined to leak with



A HOME-MADE HONEY-GATE OPEN.

The block next to the can is securely nailed in position, the heads of the nails then being soldered to prevent leaking. The handle-block is bolted tightly to make a good fit.



HOME-MADE HONEY-GATE CLOSED.

hot honey. I then soldered over all the nail-heads and holes inside the tub, made a tin tube to fit snugly in the 2-inch hole, and soldered it neatly on the inside. But even then it is not so good as the regular gate, for hot honey; but for cold honey it works as well as one can wish, and will serve very well for temporary purposes, while the cost is next to nothing.

Meridian, Ida.

We have just received the annual report of the Horticultural College, Kent, England. In this college only women are trained as professional gardeners and bee-keepers. A full bee-keeper's course is provided in connection with fruit culture. This shows very conclusively the close connection between the two industries, and it is true they are practically inseparable to a great extent.



DR. H. V. BUTTEL-REEPEN IN HIS GARDEN.

Dr. Buttel-Reepen is the author of "Are Bees Reflex Machines?" begun in this issue. He is not only a scientific man, but a practical bee-keeper as well. His work will therefore have all the more interest and value.—ED.

ARE BEES REFLEX MACHINES ?

Experimental Contribution to the Natural History of the Honey-bee by
H. v. Buttel-Reepen, Ph. D. Translated by Mary H. Geisler.

PREFACE TO THE ENGLISH EDITION.

For the English edition some additional references have been made to the important literature which has appeared on the subject since the publications of the German editions. On the whole, our knowledge has not materially changed since then. Modern animal psychology tends to discredit Bethe's reflex theory. Although the contradiction of this theory was taken as a basis for this paper, nevertheless it is concerned chiefly with the statement of experimental contributions to the natural history of the honey-bee; these contributions discuss the life and instincts of the community of bees, and incorporate some of the results gained by practical bee-keeping.

May this little paper gain friends on the other side of the ocean.

May, 1906.

BR. H. v. BUTTEL-REEPEN, Oldenburg, i. Gr., Germany.

INTRODUCTION.

The following observations are submitted after fifteen years' study, and are further to be used for a General Biology of the Honey-bee; but this larger work can not be completed until later, because of the heavy demands on my time at present. It seems desirable to publish this much of the investigation now, however, and I wish specially to consider the most vigorously debated question of the day, that of the psychical faculties of social insects, because of Bethe's¹ interesting study of this question with regard to ants and bees. I shall take up bees only, as there are many scientific observations on ants² and as especially the great myrmicologists Aug. Forel³ and Wasmann² have already overthrown many of Bethe's conclusions.

That I do not accept Wasmann's definition of Instinct will be apparent from what follows. I refer to the discussion of instincts in my "Stammes-geschichtlichen Entstehung der Bienenstaates, Leipzig, 1903, as well as to Forel's excellent paper, "Gehirn und Seele," 5. u. 6. Aufl., Bonn, 1899, pp. 34 and following.

As early as 1872, Dohrn⁴ recognized that it would benefit science if more biological⁵ investigation were carried on, and the results made useful practically. It seems to me that

¹ Albrecht Bethe, Dürfen wir Ameisen und Bienen psychische Qualitäten zuschreiben? Arch. f. d. ges. Physiologie, Bd. 70, 1898. (Also appears as a separate with other paging.)

² Wasmann, Die psychischen Fähigkeiten der Ameisen. Stuttgart, Erwin Nägele, 1899.

³ Forel, Fourmis de la Suisse. Nouveaux mémoires de la société Helvétique. Zürich, 1874. Expériences et remarques critiques sur les sensations des Insectes. Rivista di Scienze Biologiche. Como, 1900, 1901. The Psychical Faculties of Ants and some Other Insects. Smithsonian Report for 1903, pp. 587-599. Washington, 1904, etc.

Lubbock. Ants, Bees, and Wasps. International Scientific Series. New York, 1883; German translation, Leipzig, 1883.

Janet. Études sur les Fourmis, les Guêpes, et les Abeilles. Limoges, 1897, etc.

Emery. Die Entstehung und Ausbildung des Arbeiterstandes bei den Ameisen, Ueber Entstehung des Soziallebens bei Hymenopteren. Biol. Centralbl., Bd. XIV., 1894. Le Polymorphisme des Fourmis et l'alimentaire. Compt. rend. III. Congr. internat. d. Zool. Leyden, 1896, etc.

Wm. Morton Wheeler. The Compound and Mixed Nests of American Ants. American Naturalist, Vol. XXXV., 1901. Some Remarks on Temporary Social Parasitism and the Phylogeny of Slavery among Ants. Biol. Centralbl., 1905. Ethological Observations on an American Ant. Journal für Psychologie und Neurologie. Leipzig, 1903, etc. K. Escherich. Die Ameise. Braunschweig, 1906.

Bethe, l. c.

⁴ A. Dohrn. Der gegenwärtige Stand der Zoologie, etc.; XXX. Bd. Preuss. Jahrb., 1872.

⁵ The German word *Biologie* refers particularly to the study of life-history and habits rather than to all phases of animal and plant life—the sense in which it is used in English.—E. F. P.

the biological knowledge concerning *Apis mellifica*⁶ which has been gained by practical bee-keeping has scarcely entered scientific literature, and, strangely enough, the results are little regarded: it has not passed over into the flesh and blood of science. In proof of this there are the vague, defective assertions which are found in the newest editions of scientific works. Thus in a well-known text-book of zoology we read that a colony of bees contains about 10,000 workers. Such a small colony as that, 1 kilo of bees (5000 generally counted to a half-kilo) is not capable of developing under ordinary circumstances, nor of living over the winter. If a colony of medium strength is considered normal, then a normal colony contains at least 20,000 to 30,000 bees. The following statement also is wrong: "If a young queen emerges from her cell, then the former queen leaves the hive with part of the colony (first swarm) to found a new colony." Normally the swarm has issued by the time the cells containing young queens are sealed. Since it takes 16 or 17 days for the complete development of a queen, and the cell is closed on the ninth day, the hive is without an emerged queen for seven or eight days after the issue of the first swarm. The after-swarm, therefore, normally issues seldom before the ninth day after the issue of the first swarm. In Bechhold's *Lexikon der Naturwissenschaften*, 1894, there are similar incorrect statements. Among other things, a vigorous colony is said to contain, at most, 30,000 workers. But since strong colonies can sustain swarms of three or four kilos (27,000 to 36,000 bees), it follows that the whole number of inmates may amount to 60,000 or 75,000 and more, for usually a little more than half remain in the hive. Only 9000 swarming bees are counted to the kilo, because the honey-sacs of all are filled. Claus,⁸ in a paper which contains many other errors, doubts that bees are able to hear. No zoologist who has done any experimental bee-keeping can have the least doubt that bees have an excellent sense of hearing, since observations yield him hundreds of proofs. The man who is not familiar with biological facts might recognize nothing of the kind with certainty, for up to the present the organ of hearing has not been discovered.

It appears, however, that the work of Otto Schenk indicates an advance in this direction (Schenk: *Die antennalen Hautsinnes-organe einiger Lepidopteren und Hymenopteren*, Zool. Jahrb., 1902). In this work on antennæ the presence of organs is demonstrated, which, with more probability than has been possible heretofore, may signify organs of hearing. Again, the work of Vitus Graber, "*Die Insekten*," München, 1879, in picturing the social life of insects, shows a series of errors and incorrect assertions so far as bees are concerned (Part II., 2d half, pp. 232-248). A refutation would take up too much space, and would lead me too far; but I might mention, for example, that Graber declares that the queen normally flies about inside the hive, because she "can not always pass *per pedes* through the vertical paths inside" (l. c., p. 88). Further, Wundt (*Vorlesungen über*

⁶ *Apis mellifica* L., or *Apis mellifera* L.? As is well known, the rule of priority begins as far back as the tenth edition of Linnaeus' "*Systema Naturae*," in 1758. In that year we find the honey-bee designated by Linnaeus as *Apis mellifera*. Three years later he named it *Apis mellifica*, probably because he recognized that the name first given was erroneous, for the bee does not carry in honey but nectar, making the honey in the hive. It is, therefore, not a carrier of honey (*mellifera*), but a maker of honey (*mellifica*). Be that as it may, the first author himself undertook the correction after a short time. Then developed an overwhelmingly rich literature concerning *Apis mellifica* (not *mellifera*), which is now inexhaustible, even to the specialists, if the non-scientific literature on bees be included. The bibliography of the late Mr. Edward Drory, of Berlin, relative to the honey-bee alone, embraces, for example, more than 2500 works. In the catalogue "Elenchus Librorum de Apium Cultura," *Bibliographia Universale de Apicultura*, raccolta per Augusto Keller, 2300 works on *mellifica* are cited.

Under the circumstances Friese (as writer on Apidae of the *Tierreich*), and I have thought that, in spite of the rule of priority, we would not be justified in reestablishing the name "*mellifera*," which was recognized as incorrect, and shortly rejected by the first author. This is the result of mature deliberation at various times during many years. Not only were the reasons just mentioned arguments for retaining the name adopted 150 years ago, but also the knowledge that its establishment proves how powerless the regulations of the priority rule itself are in definite cases. They are powerless in spite of the rules for the "*Tierreich*," in spite of Della-Torre's "*Catalogue Hymenopterorum*," and even in spite of Friese and others of the originators of the priority rules for each case. For example, for the genus of solitary bees "*Anthophora*," the name "*Podalirius*" was introduced, or at least according to the new system an attempt was made to introduce it. But here the case was like that of *mellifica*—the first author himself, for certain valid reasons, changed the name after a short time from "*Podalirius*" to "*Anthophora*." Thus the name *Podalirius* did not prevail. It has not succeeded in becoming established in the lapse of years, and there is not the slightest probability that it will change in the future. I quote this discussion from my work which has just appeared, "*Apistica. Beiträge zur Systematik Biologie, sowie zur geschichtlichen und geographischen Verbreitung der Honigbiene (Apis mellifica, L.), ihrer Varietäten und der übrigen Apis-Arten*." Mitth. d. Kgl. Zoolog. Museums in Berlin, 1906.

⁸ Claus, *Der Bienenstaat*. Part 179 of the collection of scientific papers published by Virchow and Holtzendorf. Hamburg 1873.

die Menschen- und Tierseele, Leipzig, 1892), builds numerous far-reaching theories upon an incorrect biological basis. I shall speak of this in my "Conclusion" to this paper. The foregoing list of errors is not very complete, but let the matter end here.

While the founders⁹ of our present knowledge in this sphere depended largely upon the results gained in practice, we see now and then an almost complete ignorance of the rich material which distinguished bee-keepers have laid down in the literature of practical bee-keeping.¹⁰

As to terminology, I shall not use Bethe's phrase, "psychic qualities" (psychische Qualitäten), since it can be interpreted in various ways. Bethe gives it a definite significance, comprehending under it everything acquired in the life of an individual, and also every capacity for sensation and learning; in short, everything that transcends unperceived reflex activity.¹¹ He considers ants and bees as mere reflex machines: "It seems to me that these insects have no senses, have no ability to make experiences and modify by it their actions; that all stimuli remain below the threshold of perceptible sensations and perceptions, and that they execute, in a purely mechanical way, all the apparently reasoned actions" (Bethe, l. c., p. 98). Whether this view is warranted, we shall see further on.

The terms "reflex" and "instinct," I shall use in the significance Bethe gives to the word "reflex." Instinct is complicated reflex.¹² He lets pass as reflex the inherent faculties; the course of nervous processes is determined by inherited instincts. That acquired in the life of the individual shows the opposite; here the course of the nervous processes indicates experience, memory, learning, capability for association, etc.¹³ I shall restrict myself here to these short statements, but shall add some psychological views in the concluding chapter. I shall first discuss the "Hive Odor" and reactions resulting from it, then give my experiments and opinions on the capacity for intelligence in bees, and end with my conclusions concerning the homing instinct in bees, or the ability to find the hive, etc.

THE HIVE ODOR AND THE REACTIONS RESULTING FROM IT.

In the first section of "Investigations on Bees," Bethe (l. c.) treats the question as to how bees recognize the hive, and concludes that the recognition results solely from an odorous chemical compound (Geruchsstoff) which he calls the "hive substance" (Neststoff).¹⁴ He avoids the term "hive odor," because he thinks bees have no sense of smell.

⁹ François Huber, *Nouvelles observations sur les abeilles*. Geneva, 1814; German by G. Kleine, Einbeck, 1856; English editions in 1823 and 1841. This investigator, blind since his twentieth year, could not have carried on his observations without the help of his unusually efficient bee-keeper Burnens. v. Siebold *Wahre Parthenogenesis bei Schmetterlingen und Bienen*, Leipzig, 1856, etc.

Leuckart, *Zur Kenntniss des Generationswechsels und der Parthenogenesis bei Insekten*, 1858, etc. Surely the histological findings of these last-named investigators with regard to the presence of spermatozoa in bee eggs can no longer be esteemed as free from objections. They doubtless depend upon an illusion, for, as I have shown before (*Die Befruchtungsvorgänge im Bienenstamm*, *Bienenw. Centralblatt* Nr. 16, v. 15, August, 1899; further in *Aus den Wundern des Bienenstaates*, *ibid*, 1900), according to my investigations, the spermatozoa undergo the transformation into sperm nuclei in about 15 to 20 minutes (cf. Weismann, *Vorträge über Deszendenz Theorie*, II. Aufl., 1904, p. 250, I. Bd.); while v. Siebold says he has seen living spermatozoa in eggs after 12, 15, and 22 hours. I believe, therefore, that in Blochmann's paper (*Ueber die Zahl der Richtungkörper bei befruchteten und unbefruchteten Bieneniern*, *Morphol. Jahrb.*, 15 Bd., p. 85-96, 1889), and in Paulcke's investigations (*Zur Frage der parthenog. Entstehung der Drohnen (Apis mellif.)* XVI. Bd., pp. 474-476, *Anat. Anzeiger* v. 5, October, Jena, 1899, *Vorläufige Mitteilung*), we have the first safe histological corroborations of the theory of parthenogenesis in the honey-bee. In the meantime Petrunkevitch has given full confirmation (cf. *Petrunkevitch, Alex., Natural and Artificial Parthenogenesis*, *Amer. Naturalist*, Vol. 39, 1905).

¹⁰ v. Siebold (l. c., p. 57) expressly refers to the findings of bee-keepers as "the most important work."

¹¹ Bethe drops this expression in "Beer, Bethe, and J. v. Uexküll, *Vorschläge zu einer objectivierenden Nomenklatur*, *Biol. Centralbl.*, 19 Bd., 1899, Nr. 15, p. 517 (also in *Centralblatt für Physiologie*, 1899, Nr. 6); further in Bethe's "Noch einmal über die psychischen Qualitäten der Ameisen," *Archiv. f. d. ges. Physiologie*, Bd. 79, 1900, p. 45.

¹² H. E. Ziegler, *Ueber den Begriff des Instinkts*. *Verhandl. d. deutsch. zoolog. Gesellsch.*, 1892.

¹³ H. E. Ziegler, *Theoretisches zur Tierpsychologie und vergleichenden Neurophysiologie*. *Biol. Centralbl.*, Bd. XX., Nr. 1, 1900.

¹⁴ According to Bethe we must consider the existence of this "hive substance" as a "family odor." "I believe that these family odors, common to all the members of one family, and differing slightly from those of other families of the same species, play an important part in the life-history of the social hymenoptera. This family difference is due to the varying proportions of the constituent odors" (l. c., p. 31). This "hive substance" must be inherited, as Jäger likewise maintains (*Zeitschrift für wissenschaftl. Zoologie*, Bd. 27, 1876, p. 327). I might mention here that I find no proof in Jäger's paper that he concludes the "exhalation odor" of a colony to be solely a "family odor" as Bethe does, and still less proof that he considers this common odor to be "inherited," because it is a mixture of many thousands of inherited individual odors.

Bethe includes, under the term "hive substance," two separate substances, one giving the family odor and the other causing the "various reactions toward hive mates and hive strangers." That this conception will not cover all cases, I believe I can demonstrate in the course of my paper.

I use the expressive term "hive odor" (colony odor, exhalation odor), under which I comprehend only the existence of gaseous substances disseminated in a colony, the presence of which is detected by the bees' sense of smell.

I believe that the following odors are present in a colony of bees:

1. The Individual Odor. It can be easily demonstrated that the queen odor (see p. 7) varies with different individuals, and on the same ground (germinal variation), an individual odor should be assigned to the workers.

2. All offspring of one mother (queen) have a common inherited family odor in addition to the individual odors, belonging only to the progeny of one queen.

3. The brood and chyle odor (p. 9).

4. The drone odor (p. 10).

5. The wax odor. Since the wax is a glandular secretion, an exuded product, it may be safely taken for granted that, considered apart from the specific odor of wax, the individual odors of the wax-generators adhere to the honey-comb. Accordingly the wax structures of different colonies have different odors.

6. The honey odor. That the honey of each colony (mixed with a secretion of the salivary glands) has its specific odor is readily seen from the old practice of bee-keepers to which Bethe also alludes. If a queen be daubed with honey from a queenless colony, she will be accepted readily by that colony when inserted.

7. The hive odor (exhalation odor, colony odor). The hive odor is composed normally by a mixture of the preceding odors, or of some of them. Single bees, therefore, besides their individual odors, possess the family odor and especially the common adhering hive odor, which forms the dominant factor in the various actions toward hive mates and hive strangers—that is, in mutual recognition between bees.

If a strange queen is put into a queenless colony in a cage, a confinement of twenty-four hours is usually sufficient for the queen to have received the "hive substance," as Bethe calls it; that is, she has become "scented."¹⁸ The external adherence of the colony odor therefore suffices to make the bees permanently friendly with the foreign queen. If a swarm is made of the bees hanging in front of several hives,¹⁹ which in strong colonies often form great clusters (beards), by scooping them up in a ladle, there will probably be bees from ten, twenty or thirty different hives. If they are put into a hive and given a queen, with the observance of proper precautions, these bees from let us say, thirty different hives, form a peaceful colony in a few hours, which adjusts itself in its new dwelling and takes up the ordinary tasks of the day. Here we have thirty family odors, and about thirty to forty thousand individual odors united into a special hive odor, peculiar to this colony alone, merely by the scooping together. The proof of this can be found in the fact that a queen placed in such a colony can be set free frequently after only twelve to twenty-four hours; she has taken up the hive odor.

We see, therefore, in this case, a colony without a specific family odor conducting itself exactly like colonies which are made up of the offspring of one mother. In each case the hive odor is formed by the union and mixing of individual odors.

Now the question arises: Is this hive odor inherited? No, surely not, for the hive odor, therefore the common odor, that each individual can take up in an external way is something purely exogenous or acquired.

The power of the hive odor seems to me, therefore, to lie not in the inherent family odor nor in the inherited individual odors, but in the exogenous mixture of the two. What Bethe (l. c., p. 43) alleges for compound nests (Schüttelnester), and communicates in his experiments on bees (p. 71), is not a contradiction of this. He says that bees that had been transferred to another hive did attack almost not at all or with only slight enmity their sisters remaining in the mother hive because the common family odor lessened the hostile reaction. This proves merely that the hive odor differs from the family odor. If the latter were the predominant factor, bees of the same family would always be friendly with each other, which is not the case.

¹⁸ Further on I shall show that in many cases the bees very likely become familiar with the odor of the queen, which is a mixture of the queen odor and the hive odor.

¹⁹ G. Dathé, Lehrbuch der Bienenzucht, 5 Aufl. Bensheim, 1892; Bienenzzeitung, 7 Jahrg., No. 19.

Further, I can not regard this, the only experiment which Bethe employed (l. c., p. 71), as conclusive, since very many circumstances which have nothing to do with the hive odor effect the friendly or hostile attitude of bees, be they sisters or strangers. The forage, weather, time of year, strength of the colonies, quantity of provisions, etc., all have an influence, as is well known to those who have studied the peculiarities of bees for many years. In my experience, estrangement seems to take place between separated hive mates generally much more quickly than Bethe states, yet I think this is on the whole a secondary matter which does not touch upon the principal point.

MODIFICATION OF REACTIONS TOWARD THE HIVE ODOR.

It is contested by Bethe that the "various reactions" are based upon hive-mate and hive-stranger modifications.¹⁷ It seems to me that it is hardly possible to grant such a far-reaching conclusion when Bethe's investigations give no striking proof that reactions toward the hive odor are incapable of modification. We learn nothing from the illustration given above. In the critical examination of robbing between colonies, we find that a great number of factors enter, which can be discovered only after years of keen observation and fortunate circumstances. In the manual of bee instruction which I helped to publish¹⁸ (see p. 9), I recommended also fumigation of the hive of the robbing and not of the robbed colony, but that is no proof that the hive stimulus can not be modified. Bethe believes that no psychic elements enter into the actions of a colony and apparently the short time he could devote to bees led him to this view. I submit the following investigations on this question.

THE SWARMING-OUT OF A QUEENLESS COLONY.

If two hives are placed close together, and the queen and brood are removed from one, it sometimes happens that the entire colony, from which every possibility of rearing a queen has been removed, will enter the queen-right¹⁹ (weiselrichtigen) colony, humming "joyfully." These bees seldom sting, and are received in a friendly manner, although the normal queen-right colony should react hostilely, if it followed a chemical reflex incapable of modification. What causes this swarming-out of the queenless colony we shall see further on.

INTENSIFYING THE REACTION.

If a colony tolerates robbing without attempting to suppress it, a stimulating food should be given it, such as fermenting buckwheat honey²⁰ several years old or a mixture of honey and brandy, and the hive should be shaken to arouse the anger of the bees, etc. Then a better defense is made, the irritability of the colony is increased, and robbers are better recognized and repulsed.

The "courage" and the "attention" of the colony are increased, and therefore we have intensified reactions toward hive strangers.²¹

¹⁷ "It has been thought possible to make the individuals of a hive 'recognize' each other better by fumigating the colony with some strong smelling substance—camphor, naphthaline, baldrian, for instance. If this be done to a colony exposed to frequent plundering it is thought that the bees of this hive will more readily detect the robbers to whom the scent does not adhere. Were this correct, then it would prove that the various reactions toward hive mates and hive strangers could be artificially modified.

"I believe that I can assert positively that such treatment does not increase the reaction toward strange bees in the least, but only that the bees of all strange colonies react more vigorously toward the individuals thus scented. (Therefore if it is desired to defend a colony from robbing, it is the robbing and not the robbed which must be fumigated.)

¹⁸ We see, therefore, that here, as in ants, the various reactions toward hive mates and hive strangers bring us back to a simple chemical reflex" (Bethe, l. c., p. 71).

¹⁹ G. Dathe, Lehrbuch der Bienenzucht, 5 Aufl., published by R. Dathe and H. Reepen (v. Buttler-Reepen), Bensheim, 1892, p. 181.

²⁰ There is no word in common use among English-speaking bee-keepers to indicate the normal condition of a colony in the possession of a queen, either mated or unmated. It seems desirable, therefore, to translate the German term literally, although "queen-right" is an undesirable term. It has already been used by some American writers.—E. F. P.

²¹ Dathe, l. c., p. 179.

²² The Lüneburger bee-keepers sometimes employ a particular method for putting a stop to robbing. If the honey-flow is strong, so that the powerful odor of honey issues from the hive-entrance, a general robbing occasionally goes on; but the robbers are hardly noticed by the bees of the hive, apparently the strong odor of honey covering the strange odor of the robbers, or the certain, quiet entrance deceiving the inmates of the robbed colony. In order to call out a stronger reaction, the bee-keepers turn over the skeps so that the wider opening of the skep is turned to the front. One would think that, since the whole honey-comb is now open to the air, robbing could be effected more easily; but this is not the case, for the powerful odor of honey is now easily "dissipated," and the robbers, because of the change in the position of the entrance, are uncertain, and hesitate. Thus the attention of the colony is drawn to the robbing, the fortification is well protected, and every attack is beaten off (cf. G. Lehzen, Hauptstücke der Lüneburger Bienenzucht, 1900, Hannover).

OVERCOMING THE REACTIONS TOWARD HIVE ODOR.

It is interesting that this powerful reaction toward hive odor, though generally acting hostilely, can be subdued and turned in other directions. Thus bees which blunder into the wrong hive, as they return from the fields with filled honey-sacs, are seldom attacked.

The behavior of such "begging" bees is most peculiar. With the abdomen dragging on the flight-board, the proboscis far extended and dealing out the honey to her tormenters, she is trying to insinuate herself into the hive in order to deposit her honey, and in this she often succeeds. (Here and further on I use anthropomorphic terms for better demonstration. It is understood that many of these actions rest upon reflexes and instincts, but it makes the case clearer to use such terms, as "to insinuate" for example.)

The old practice of transposing hives is based on the fact that strange bees, laden with honey, are received in a friendly way. If a weak colony needs improving, it may simply be put in the place of a very strong one, the two hives changing places. This transfer will be successful only on days in which there is a good honey-flow and all flying bees return heavily laden. If the hives have the same outward appearance, and (most important) have their entrances at the same height, almost all bees will fly in as usual. Thus the weak colony will be strengthened from the strong one, and stinging seldom occurs.

Also, if one wishes to prevent swarming, the flying bees may be drawn off in the same way. I can not at this point go into the many modifications of this practice, and must refer to the manuals of instruction.

If a strong colony stands next to a weak one during a rich honey-flow, and succeeds in filling its own chamber to overflowing, it happens now and then that the strong colony, having no further room, will help to fill the hive of the weak one in the most peaceful way. So we see that of two colonies which should react hostilely toward each other, either one or both may be put under peculiar conditions in order to handle both in the same way with a peaceful reaction between them. For example, if two colonies are sprinkled with some strong-smelling liquid, or powdered with meal, they may be united without risk.

If bees are stupefied with saltpeter, chloroform, ether, or puff-ball, the same thing can be done with no danger of mutual stinging, but at the same time the earlier orientation is completely lost. When the bees recover from their stupor they no longer recognize their own colony, and can be united to other colonies at will. What conclusions are to be drawn from this capacity for learning, etc., we shall see later on.

Incidentally, I might mention here a curious aberration of instinct. The literature of bee economics records some cases in which bees showed unaccountable hostile reaction toward their own hive mates. Thus it has been observed some times that a colony will sting a great number of its own flying bees as if they were intruders. This behaviour has been noticed for a long time, and it finally did lead to the destruction of the colony. Possibly here there is a degeneration of that instinct which causes colonies to place bees at the entrance to control the flying in. Perhaps differences of odor come into account, or perhaps both stimuli act together.

It is probable, too, that we may be dealing with defective observations, although errors of instinct in bees are not at all uncommon, and frequently in the spring it can be proven that bees, in an inexplicable mistake, even attack their own queen and ball her. The colony is then in wild confusion, and between the combs or on the bottom-board is the poor queen in the middle of a cluster of bees; she often comes out of the tumult a cripple. Another case of failure in instinct is as follows: As is well known, bees now and then build queen-cells over drone eggs.²² If a queen-cell is of more than ordinary length it is tolerably sure to contain a drone larva.²³ The too invigorating royal jelly²⁴ seems to be unwholesome

²² O. vom Rath, Ueber abnorme Zustände im Bienenvolk. Berichte der Naturf. Ges. Freiburg i. Br., 8. Bd., 1894.

²³ There is also a prevalent idea that such cells are not as rough as normal cells containing queens; some books on bee-keeping even go so far as to try to figure the difference.—E. F. P.

²⁴ Concerning the varied chemical composition of pabulum for the three kinds of bees, see A. von Planta. "Ueber den Futtersaft der Bienen," and "Nochmals über den Futtersaft der Bienen," Schweiz. Bienezzeitung, 1888-'9; further, A. von Planta, Zeitschrift f. phys. Chemie von Hoppe-Seyler, 1888, Bd. 12, Heft 4, pp. 327-354, and also Bd. 13, Heft 6, pp. 552-561; further, Dathe l. c., p. 24.

for the larva; it falls out from the food because of the abnormal size of the cell, and that is the cause of their always lengthening the cell. Usually the drone dies.

THE ODOR OF THE QUEEN.

The individual odor of the queen is doubtless in many cases a very small part of the odor of the hive, but often may form the dominant factor. The exhalation of the queen is so intense that it can be perceived by man. It is very characteristic and adherent, being somewhat like the odor of thyme. If a queen is crushed on a board, the bees of her colony smell for several days around the place where she was killed. If the bees are allowed to run over the board, they gather there; and, lifting the abdomens, fan their wings in a peculiar way.

It often happens that after-swarms, also swarms with young queens, fly together and unite into a powerful swarm-cluster. The bees in this cluster do not attack each other, in spite of the varied hive odors. The "swarm-dizziness" extinguishes the reactions toward the foreign hive odor, just as it also almost destroys the sense of orientation, so that the impulse to seek the parent colony is lost,²⁵ at least under normal circumstances. The swarming bees, instead, remain in the home they have taken up; the field bees, which some days before, or immediately before the swarming, have been bringing honey, pollen, and water to the parent colony in the usual way, will, a few hours later, after they have become oriented, bring their burdens into the new hive. Under the proper conditions this can be placed adjoining the old one. The memory of the old birthplace has completely disappeared. I shall speak later on of an exception to this.

If it be wished to separate these united swarms, the whole cluster may be put into a large box containing as many twigs of a tree as there are swarms. Over night the colonies separate of themselves, each hanging on a twig.

It is safe to take for granted that a purely mechanical separation takes place here, and, evidently, according to the various hive odors. I nevertheless believe that a still more powerfully determinative stimulus enters—the odor of the queen. Each colony congregates around its queen;²⁶ and if the queen is taken away from one swarm it will unite with another possessing a queen, in spite of the hostile hive odor.

It may be thought that here the family odor, the possession of all the offspring of one mother, enters its claim; but I notice that the swarms may be united ingeniously, even if the queen does not originally belong to the colony in question, but comes from a queen-cell taken from a strange colony. In addition, we continually have to do with unfertilized queens in normal after-swarms, therefore we can not speak of the offspring of one mother at all. The queen of an after-swarm is the sister of the workers, if I may so express myself.

It is the queen odor familiar to the bees which acts with the hive odor (to be sure, the reaction toward the latter seems to disappear during the swarming), and perhaps holds the community together, but the queen odor is the dominant factor. This may be seen from the first experiment (p. 5) also, to which I shall now return. The bees of the queenless colony scent the queen in the neighboring hive, and, paying no attention to the foreign hive odor (toward which, under ordinary circumstances, they would react sharply), they go over into the enemy's camp "humming joyfully." Very probably sound perceptions also come into consideration—that is, the reaction toward the humming of the "queen-right" colony (see later).²⁷

If the odor of the queen is so powerful, it is clear that this individual odor alone

²⁵ Bethe, in dealing with the "psychical qualities," has not considered either the act of swarming, which is an all-important factor, or the individual odor of the queen. We shall see presently what interesting bearings swarming has on this question.

²⁶ Some may take exception to this statement, perhaps, and believe that this gathering together is due to other instincts—the sex instinct or the instinct to swarm which is characteristic of bees; but it must be kept in mind that the bees separate into single colonies only if the queens of the various colonies are present, manifesting their presence by the scent which exhales from them.

²⁷ In this there might be found an apparent contradiction to the "disregard of the queen" (p. 14). The finding of the queen in the next hive is not by scenting from hive to hive, for the distance is too great. The agitated queenless bees run searching over the front wall of their hive and also over the front wall of the one standing next. In this way some come to the entrance of the neighboring hive, where the odor of the queen and the sound of contented humming are issuing forth. At once they begin to lift the abdomens, and fan with their wings. Their mates near by take up the humming, and soon the whole colony enters the queen-right hive in order, with lifted abdomens and fanning wings.

determines the special character of the hive substance, especially when this is particularly strong. This would happen in the spring during the increased sexual activity²⁸ which is demonstrated by the enormous number of eggs laid (2000 to 3500 and more in twenty-four hours). That it is not always the determining factor, follows from the fact that there remains a hive substance capable of causing reaction, even if the queen is taken out and kept at a distance.

At such a season, during the strongest breeding period, the bees care for the queen with special zeal. It may not be the very "sympathetic" odor²⁹ alone which causes them at this time to surround her in a close cluster, for her increased need of nourishment³⁰ increases the constant care of the bees around her. Nevertheless, the singular pleasure that bees take in the strong mint-like exhalation from the queen is shown in the attachment of the "court," this affection being demonstrated by the single "courtiers," who from time to time lick the abdomen or thorax most zealously, humming continually in a characteristic "contented" way.³¹

The bees wish to sniff the odor, so to speak. A queen in an observation hive can be seen constantly surrounded by a circle of brood nurses who continually turn the head to her. If she advances slowly, the bees yield the way, moving backward. From time to time the "caressing," licking, and feeding go on. It can be easily understood how this attitude has often been interpreted as the expression of a peculiar reverence toward the "ruler of the community." The "respectful" walking backward, the "tender" licking, the irreproachable service (as the queen never leaves the hive, she is forced to deposit her fæces in the hive, and the "courtiers" immediately clean away all traces) closely approach anthropomorphic appearances. But perhaps it might be proven that the individuality of the queen is the dominant factor. A foreign queen with the same strong odor of mint would be stung in spite of the pleasure in the smell.

In autumn and winter, also early in the spring, the bees concern themselves relatively very little with the queen, and still less with a young virgin. The lessened exhalation (it is as yet very weak) may explain this phenomenon in part.

It seems to me that if the odor of the queen is extremely penetrating and adherent,³² as it doubtless is, the view (mentioned also by Bethe) that the queen takes on the hive odor of the queenless colony in which she is placed in a cage, is not correct in all cases, for the colony is "scented" by the strong odor of the queen, which is distinctly perceptible to our sense of smell. Very rightly, therefore, O. vom Rath³³ says that "the workers first accustom themselves to the odor of the queen." The stronger, then, the exhalation from the queen, the more easily must be her acceptance or, the scenting of the colony proceed; and consequently the mutual friendliness also. I find from many investigations that a mated queen heavily laden with eggs is more easily accepted than an unfertilized one. The following rules³⁴ of bee-keeping harmonize with this statement: 1. "An unfertilized queen is not accepted by many colonies if formerly they have had a fertilized one." 2. "The older a queen is, the more readily is she accepted." 3. "Weak colonies accept queens more easily than strong ones." 4. "Queens of the same kind are accepted with less difficulty than those of different varieties; as for example, Italians, Caucasians, Cyprians, etc." Here in every case the different odor of each variety plays its part.

It may seem obvious that it is easier to demonstrate this scenting, whether it be on only one side or mutual, with a weak colony, but here other instincts come into consideration too, as we shall see further on.

²⁸ Jaeger, Ueber die Bedeutung des Geschmacks- und Geruchstoffes. Zeitschrift f. wissensch. Zoologie, Bd. 27, p. 327, 1876.

²⁹ In order to keep a swarm in the hive, the hive may be rubbed with thyme.

³⁰ As is well known, the queen can eat only honey independently; but the probosces of the workers are necessary to feed her with nitrogenous food.

³¹ I might say again that anthropomorphic designations are chosen for purposes of clearer demonstration.

³² I took the queen from a strong colony, put her in a cage, and after a few minutes removed her. Fifteen minutes later I placed the empty cage upon the flightboard of the colony concerned. Immediately the bees sensed the odor, and alighted fluttering upon the cage, which they had completely ignored before (see also p. 7).

³³ O. vom Rath, Ueber abnorme Zustände im Bienenvolk, Berichte der Naturf. Ges. Freiburg i. Br., 8 Bd., 1894.

³⁴ Dathc, l. c., p. 211.

THE BROOD ODOR.

It is highly probable that it is not only the odor of the queen at all times which causes a queenless colony to enter a hostile camp (see p. 5), but during the months of greatest increase, from March to June or July, a powerful constituent of the hive odor is the odor of the brood, a warm characteristic vapor exhaling from the thousands of brood-cells. The chemical processes going on at this time in the cells, for the development of the larvæ, are of so intense a nature that a temperature of 28 to 32° C. is maintained in the brood-chamber. On spring days this exhalation from the brood, which smells like freshly baked bread, may be perceived some distance away in the direction of the wind. Very probably this strong odor sets free the same reaction in queenless and broodless colonies as the queen odor does; but as such colonies always go over to the queen-right colony, even if there is no brood at all or only a minimum amount, so in spite of this vapor from brood and pabulum (the larvæ swim in food), it is very likely the queen odor and the humming of the queen-right colony which are of first importance.³⁵

But, on the other hand, the attachment of the bees to the brood is very strong, as may be seen from the fact that an unruly swarm, which has already withdrawn from one unaccepted hive, will certainly remain if a frame of brood is hung in it. Again, swarms can often be enticed from an undesirable place for capturing them (the middle of a hedge, for example), by means of a frame of brood.³⁶

THE INDIFFERENT ODOR OF YOUNG BEES.

Young bees, particularly those just emerging, have an apparently faint and indifferent odor, and they are, therefore, not attacked in a strange colony; the same thing is true of young queens. In cutting out queen-cells, it happens repeatedly that the young queens which are entirely or nearly "ripe" free themselves from their compartments. If such a queen is immediately allowed to run through the entrance of a queenless colony, the queening is usually successful. This depends, perhaps, upon the fact that, as described, the individual odor is not yet developed, analogous to the similar indifferent "infant odor," and that the common reaction-loosing hive odor has adhered but little so far. It is curious that there are colonies which will not allow themselves to be requeened;³⁷ then all artifices are in vain.

However, in the winter months, when the bodily functions which determine the intensity of the individual odor are for the most part quiet or weakened, the strength of the individual odor decreases. In consequence of this we have prompt friendliness with strangers, since the lessened odor of the hive excites only a weak reaction. Therefore a union of colonies can be undertaken in early spring without observing the precautions otherwise necessary.

I noticed one day a change in two hives standing close to each other, which was totally unintelligible to me. Colony "A," in which a vigorous increase was to be expected, showed a constant diminishing of numbers, while colony "B" strengthened in a surprisingly short time. By good fortune colony "A" was of the native brown variety, and colony "B," a yellow Italian hybrid. This color distinction of the varieties, which has helped to solve so many mysteries of the domestic economy of bees, brought the explanation in this case. I was soon sure that colony "B" was taking up the young from the other hive, and I found out how after long observation. A passage through possible crevices could not take place, nor could the crossing be from one alighting-board to the other; therefore only the flying bees had to be taken into consideration. I noticed after some time that the young Italian bees always took their flights of orientation earlier than their neighbors. Now, when a thick cloud of these young bees, humming loudly, would be flying in front of colony "B," the native colony would gradually begin to send out bees for orientation, but its mass of humming bees was always considerably smaller. This was because many bees, attracted by the loud buzzing, immediately plunged into the neighboring tumult, there oriented themselves, and accordingly entered colony "B" thereafter. There they were

³⁵ The "constancy" of bees to their queen, which is always the dominant instinct, manifests itself in a starving colony by the fact that the queen is always the last to die; she is fed to the end by the dying bees. In order to confirm this, I put a queen with a few bees and very little food into a box covered with wire gauze. After forty-eight hours the bees were very weak; two days later only four were still alive; the next day but one was living, while the queen was apparently as vigorous as ever. The last surviving worker lay on its side unable to crawl; but when the hungry queen approached demanding food, it tried feebly to join its proboscis to that of the queen in a vain attempt to give her food. Finally the queen turned away; and when I looked again, half an hour later, the last worker was dead, but the queen showed no sign of weakness. I then put her back in the colony.

³⁶ Dathe, l. c., p. 225 and 230.

³⁷ Bienenwirtsch. Centralblatt, Jahrg. 28, Heft 19, p. 298, 1892.



accepted on account of their indifferent odor, and chiefly, perhaps, because of their entirely "harmless" conduct.

FAILURE OF THE HIVE-ODOR REACTIONS IN QUEENS AND DRONES.

It is of interest that the hive odor of a strange colony causes no reaction at all in a queen. Queens never react either peacefully or hostilely toward strangers or toward bees belonging to the hive. They demand nourishment from every bee, and may maintain themselves even in the most hostile colony as long as it is queenless. Even the "angrily" buzzing bees which besiege the queen-cage in a solid mass, and which try to bite and sting the queen through the wire cloth, put the required food into the extended proboscis of the queen. In this manner a queenless colony will often feed ten or twenty confined queens; but if one should accidentally free herself and be accepted by the colony, then the bees will let the rest starve.

The queen recognizes as an enemy only her "rival," even if reared in the same colony (daughter or sister), and who, therefore, must have the same family and hive odor. If two queens come upon each other, only one will remain on the battlefield.³⁸

If the queen is pleasing to every bee in every colony, the same thing may be said of the drones, who are extremely cosmopolitan, and who loaf about from hive to hive, and in consequence, apparently, of their specific odor, they are received peacefully everywhere, provided, of course, that the killing of the drones has not yet begun. At no time do they display the smallest response of any kind toward other bees, except when they accomplish the object of their existence in the mating-flight.

ABNORMAL HIVE ODOR.

It is worthy of note that drone-producing (fertile worker) colonies, that is, colonies in which the workers take to egg-laying because a queen is lacking, and on account of lack of brood, are not only difficult to requeen, but also equally difficult to unite with queen-right colonies. This is doubtless in consequence of the peculiar hive odor called forth by the presence of so many egg-layers whose number increases the longer this abnormal condition lasts. According to the investigations of Dönnhoff, almost all the bees finally lay eggs without conducting themselves differently from the usual non-laying bees.³⁹ A true queen odor does not seem to develop, and I have observed that drone-laying queens are never rendered the "homage" which a normal queen receives. As long as she is unfertilized, she seems to be unnoticed by the inmates of the hive; but as soon as she begins laying eggs she has around her constantly a ring of "courtiers" (see p. 7). Other colonies very frequently may be united without special precautionary measures, but not so with fertile-worker colonies, which can be joined successfully only by the application of very special precautions.⁴⁰ We therefore have here an abnormal hive odor of a peculiar kind.⁴¹

In any case it is evident from the foregoing that the hive odor is exceedingly complicated—much more so than would appear from Bethe's account; and the idea of a simple chemical substance and a chemical reflex, incapable of modification, is not enough to clear up the proceedings which are involved.

³⁸ The queen is normally the absolute "monarch" in the colony; but in spite of that we not seldom find cases where there are two egg-laying queens. Here we have the successor encroaching upon the old decrepit queen before the latter dies. But under such circumstances there are always two brood-nests—the queens do not come together. The following observation stands alone, and is the more remarkable because it has to do, not only with two queens, but with two of different varieties. "Since I had the opportunity," writes one Mr. Breuer, in the Rheinischen Bienenzeitung, "to obtain a purely mated Carniolan queen, I took out the old queen on July 17th, and put in the Carniolan. She was accepted without delay and immediately began laying. Another queen was positively not present in the colony. The brood developed quickly, but I kept noticing among the young bees Germans as well as Carniolans. When I revisited the hive I found upon the same frame, hardly five centimeters apart, two magnificent queens, peacefully together—one German, the other Carniolan. The brood-nest was not divided, but just as normal as if the eggs had all been laid by one queen." (See reference in Bienenw. Centralblatt, No. 22, 1899, Hannover.)

³⁹ Bienenzeitung, XIII. Jahrg., No. 20. In passing, I might submit the following: It has been shown experimentally that, as in the circumstances cited, the workers (normally sterile) take up egg-laying. I shall here mention only one such investigation, and shall not take up the various anthropomorphic explanations which are usually given. There is a wide-spread view among bee-keepers that the larvae of workers which are located nearest to the queen-cell are fed occasionally on royal jelly by mistake; on account of this exceptional nourishment, it is believed that a better development of the ovaries may take place. This view is held also by v. Siebold and Huber. (The ovaries of workers normally consist of about twenty to thirty egg-tubes, whereas those of the queen contain about four hundred.) Parallel with and partly qualified, by this view is the incorrect idea that there is only one or a few egg-laying bees in a drone-producing colony; but if one realizes that almost all workers in such a colony lay eggs, this view is already weakened. In my opinion we here have to do with the same reflexes which induce a colony to produce a young queen during the lifetime of an old weakened queen that is laying eggs in insufficient numbers. What "prudence" and "deliberation" on the part of the bees this suggests to the ordinary observer! Again the same reflexes impel a colony to erect queen-cells if the queen is kept confined for a long time (see p. 14). It is, I believe, for the greater part an unsatisfied instinct for feeding. In the first case we have the pabulum, which is produced in great quantity, and which is not reaching its natural destiny, acting to produce a hypernutrition of the bees, and consequently the stimulation of organs which normally are not stimulated at all.

⁴⁰ Dathé, l. c., p. 161.

⁴¹ I shall not consider further the special abnormal hive odors generated by disease (dysentery, foul brood, etc.), nor through the irritability over the lack of the queen.



THAT MYSTERIOUS TROUBLE; THE HONEY GATHERED DURING CERTAIN ATMOSPHERIC CONDITIONS WAS THE CAUSE.

On page 1568, Dec. 15, I read Mr. Youngman's article on the loss of his bees. Twice during 43 years my bees gathered honey in the fore part of June that did not agree with them; and if it had not been for a sudden change for the better in the weather conditions my colonies would have gone down as Mr. Youngman's did.

In the summer of 1906, while on my rounds through the province inspecting apiaries I found many apiaries affected just like Mr. Youngman's, only not so bad. For a time sick bees could be seen on the grass in front of the colonies, crawling away to die; and when I examined the colonies I found a good many dead larvæ here and there all through the brood-chamber.

Mr. Youngman asks if this trouble will return. No, not if the atmospheric conditions are right when your bees are gathering honey, and they are generally right then.

Woodburn, Ont.

WM. McEVOR.

GERMINATING BASSWOOD SEED.

I have tried to germinate basswood seed in all kinds of ways, and have never yet been able to make more than a very few grow.

Austerlitz, Mich.

H. W. HYSER.

[It is very difficult indeed to germinate basswood seed. We manage the problem, however, very satisfactorily by taking up the little plants under the basswood-trees every spring. Nature does better than we can. Evidently basswood seeds require considerable freezing and thawing before they will germinate. At all events, the young trees will spring up very numerous under a thrifty basswood providing there is not too heavy an underbrush nor too many dead leaves. If the soil is not too heavily covered with grass the young trees will come up in large numbers. These can then be transplanted.—ED.]

MEETING OF THE LEBANON COUNTY, PA., ASSOCIATION.

The Lebanon County Bee-keepers' Association held a meeting Dec. 29 at the queen-rearing apiaries of S. K. Snyder, Lebanon, Pa., to elect officers for 1908, and transact other important business. A feature of the meeting was a display of wax, ranging through all shades from almost pure white to black, showing the results of careful rendering from clean combs, and carelessly

from old dirty and pollen-clogged combs. There was also a display of fancy comb honey by various members.

The Association holds quarterly meetings at the home of some member, where they display their products, have social chats, tell of their success or failure as the case may be, and try to outdo each other in the production of fancy honey and wax. Much interest is taken in those meetings, and they are looked forward to with pleasure.

The financial condition of the association is good. It has 25 members on the roll, with prospects of a good many more.

E. L. BROWN, Sec.

LIQUEFYING HONEY BY EXPOSURE TO HOT AIR, OR OVER A STEAM-COIL.

In your footnote to Mr. Townsend's article, page 1575, Dec. 15, you say, "The novice should clearly understand that honey should never be heated except over a body of water." Are you sure that this is strictly correct? A few years ago the question of using dry heat to liquefy granulated honey was discussed in our State convention at Madison. Mr. Geo. W. York, of Chicago, said that he placed a 60-pound can of honey on his steam-register, and it was nicely liquefied without injuring the honey. Since that time I have liquefied tons over an asbestos mat placed on the top of a stove-drum over a soft-coal stove, and always without any detrimental effect.

I have seen the plan of placing the cans over an ordinary hot-air register, in any home or building where a furnace is used, put to the test with like good results. I believe that dry heat is all right, only it is slower than the hot-water plan. But in many cases it is very handy, and the element of time may make no difference. The main point is to heat the honey to a temperature not high enough to injure the flavor. The dry heat can be gauged as readily as the other, and is a safe method if properly applied.

HARRY LATHROP.

Bridgeport, Wis., Jan. 25.

[There is not the slightest objection to liquefying honey on a coil of steam-pipes or furnace register; but many do not have these. To heat a can of honey on an ordinary stove-mat we should say would be attended with a great deal of risk, to say the least. You, as an old veteran in the business, would have no trouble, but to advise a novice to attempt that method would be unwise. We still believe that the average person should melt his honey over water unless he has steam-coils or a furnace-register at his disposal; and even then the hot water would be quicker.—ED.]

A REPORT FROM AN AUSTRALIAN BEE-KEEPER.

It may interest some of your readers to know how we are progressing in this part of the world. We are having a very dry spring. The outlook for a honey crop is not at all bright. The bees wintered well, but would not build up except by feeding. I have 130

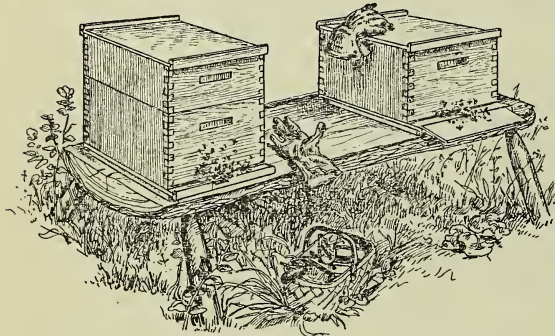
hives of bees, half of them are strong, and the other half fair; but I have been feeding for about six weeks to keep them in good condition should the weather break. I find the articles written by E. W. Alexander, Doolittle, and Dr. Miller very interesting—in fact, some of the kinks we get from the pens of these men are worth dollars to us, which we may never find out in a lifetime by our own experience.

F. C. GOLDER.

Pittsworth, Queensland.

A DURABLE HIVE-STAND.

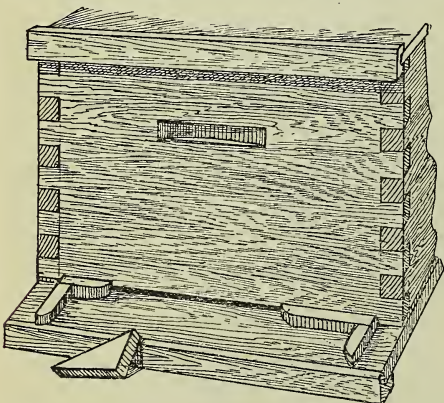
The hive-stand for me is a bench made of slabs from a saw-mill, cut long enough for two hives. Bore two holes in each end for the legs. If for a hill-side, make the front legs longer to even up the grade. I use lo-



HIVE-STAND MADE FROM A SAW-MILL SLAB.

cust or red cedar for legs, and they last a long time. Few men will ever live to use the second set. Such a stand is cheap, and handy to move, and better than cement to save the hive-bottom.

For contracting the entrance to the hive, make a letter L of two strips one inch square. One of these should be three inches long, the other two inches. By reversing we have a



small or medium entrance, said letter L to lie on the alighting-board. A corner may be sawed from a board as shown, and I like

such a block better, only it costs more if the lumber has to be bought.

Blairstown, N. J.

W. E. CONKLIN.

TOP AND BOTTOM STARTERS; A REASON WHY COMBS ARE SOMETIMES IRREGULAR; HOW TO CORRECT THE OCCASIONAL DEFORMITIES.

I have just read W. A. Pryal's trouble with bottom starters in sections, and Dr. Miller's ideas in regard to his failure. I have had the same deformed comb as shown in GLEANINGS, but not more than one in two or three hundred when I used full sheets of foundation.

I use the Hubbard section-press and Daisy foundation-fastener, and the tall Ideal plain section. I cut the starters as wide as they will work well between the walls of the section. My explanation of the cause of the deformity, or not connecting of top and bottom starters, is this: Occasionally a section will not stay square as it leaves the press. When the foundation starter is put in the top, the reëntering side of the section crowds the foundation to the obtuse angle, and, later, when it is placed in the super and squared up, the side of the section next to the obtuse angle strikes the foundation and presses it out of plumb at the opposite lower corner so far that the bees fail to connect it with the bottom starter, but fasten it to the fence, even when I have carefully

leveled the hive-stand with a spirit-level. Sometimes the starter is broken loose from the top entirely.

For these reasons I cut sheets of foundation in two, and used only half-sheets for the top and about a $\frac{1}{4}$ -inch piece at the bottom. This practically overcame the trouble. I have seen the two combs meet half way, but I never saw the lower one tip over to one side. The only combs fastened to the fence was where the upper starter fell down.

After following this plan for several years, getting straight combs, with only the fault that there might be creep-holes on the sides in case of a light honey-flow, I tried again with full sheets at the top of the section, and the lower starter not as wide as usual. I watched those sections that were not square, and corrected their shape till I saw them properly placed in the super. In this way I have reduced the number of deformed ones to a minimum, and believe it pays to use full sheets of foundation in sections, with a bottom starter.

A. D. HOPPS.

LaMoille, Ill.

INCREASING THE CAPACITY OF THE ALEXANDER FEEDER BY THE ATMOSPHERIC PRINCIPLE.

Ever since the Alexander feeder has been on the market I have been watching for somebody to say something about a Board-

man-Alexander feeder. Take a board about $\frac{1}{2}$ in. thick and $4\frac{1}{2}$ wide. Bore a three-inch hole through it and nail it on the top at one end of an Alexander feeder. You can use either quart or one-half-gallon Mason fruit-jars. It can be used either with or without the jar, according to the amount you want to feed. The jar should project down in the feeder about $\frac{1}{2}$ inch or more. I make my feeders out of 2×4 material, boring them out with an expansive bit. No special cap is needed. Just punch some holes in a fruit-jar lid.

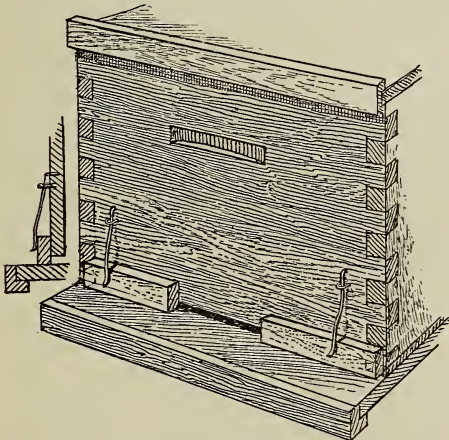
HARLEY CONDRA.

Seymour, Iowa.

[This feeder was illustrated on page 151 of our last issue.—ED.]

SPRINGS TO HOLD THE ENTRANCE-BLOCKS IN PLACE.

I have a very simple device to use for keeping the entrance-blocks in place. I have found the blocks so often moved, and perhaps a weak colony robbed out, that I tried the plan I now use, and find it works perfectly. I use a spring for each block, made from a piece of No. 9 steel wire, 8 in. long, with $\frac{1}{2}$ in. at one end bent at right angles. The short end is driven into the front of the hive about $2\frac{1}{2}$ in. from the side, and high enough so that the lower end is just above



the bottom. A small staple straddles the spring an inch from the top, leaving about 6 in. clear. The entrance-block ($\frac{3}{8} \times 1\frac{1}{2}$ on edge) slips between the free end of the spring and the front of the hive. The springs are perpendicular when in place.

McAlpine, Ont., Can. E. H. CLARE.

LATE FALL FEEDING AS ADVOCATED BY E. W. ALEXANDER.

I wish to say I most heartily indorse what Mr. E. W. Alexander says in regard to late fall feeding of bees. Jan. 1, page 29. I have experimented along that line for several years, and I have found where fed heavily with sugar syrup, owing to climatic changes, or weather, or some other way, possibly the conditions of the colony, the stores fed would granulate unless there was added 5 lbs. of

honey to every 20 lbs. of sugar used. If tartaric acid was used instead, I have never lost a single colony fed this way, and packed five or six inches on sides and back end of hive, 10 to 12 inches of buckwheat chaff on the top, with the cover of the hive slightly raised at the back end of the hive, then closed after zero weather is past. My bees have been always in fine condition in the spring.

Dushor, Pa.

C. W. RUMSEY.

THE ACTION OF THE NEW NATIONAL PURE-FOOD LAW WITH REFERENCE TO HONEY PUT UP IN TIN.

Please tell me if extracted in tin packages is subject to the food and drug law.

North Creek, Ohio.

F. J. KRUMM.

[Honey put up in tin, especially original packages, does not necessarily require labels; but all such honey, when shipped from one State to another, must be exactly as billed; that is to say, it must conform entirely to the representations of the seller to buyer. If labels are used they must exactly represent the contents.—ED.]

PIE-PLATES FOR HOLDING FEED WHEN COLONIES ARE SHORT OF STORES IN COLD WEATHER.

Last fall I bought a lot of bees that had been worked for extracted honey. The one who worked them left enough honey to feed the bees until the next season. But as it was late in the season I concluded not to feed until needed, or to defer feeding until spring if possible; but early in the winter the children where the bees were located moved the lids and cloths on the hives so the stores that they had were robbed and wasted.

After saving the remnants I saw that I would have to feed. After the first attempt at making candy in greased pans I was somewhat disgusted with all the bother and fuss. Then I remembered that some one told me, or I read it or dreamed it, that the prepared hot candy could be poured into pasteboard box lids and bodies cut down to the proper depth.

As I was fussing with this plan and now then expressing my disgust, a friend who was living with me gave me an idea. The next few minutes found me riding as fast as I could to the nearest bakery; and, after arriving home, all the fuss and bother was over, as all I had to do was to pour the hot candy into the paper pie-plates that I purchased, and set them away to cool, after which they were given to the bees.

Before my friend mentioned the pie-plates the different books and papers I had read put loaf sugar in my mind; but I think my friend's plates saved me money, and the bees received the required feed with less difficulty, as I found a few with liquid feed near the cluster, and only a little granulated honey in the hive.

It seems to me as though the editor and some others did a little experimenting on this line last winter, but too late to help me; and as I never read or heard of the paper

plates I thought I would tell the whole thing, even if some things were retold.

Ft. Collins, Colo. R. L. PENNELL

[In our issue for Jan. 15, page 96, we gave some experiments on feeding candy in winter. Perhaps it is this to which you refer.

Candy made of sugar and honey mixed into a soft dough should never be given to a colony of bees *unless* it be given in paper pie-plates, or wooden butter-dishes, or some sort of receptacle to prevent the candy, when it becomes warm or moist, from running over the frames and killing the bees.—Ed.]

THE LOSS DUE TO EVAPORATION IN THE FEEDING OF SUGAR SYRUP.

I see you and Mr. U. H. Bowen overlooked two very important points regarding his experiments in feeding bees, as recorded on page 1599, Dec. 15. 1. The bees had not yet completed evaporating that syrup when he did the last weighing, as will be seen by comparing weights at the different dates. From the 15th to the 17th, out of the 6 lbs. previously fed, there was a loss of 4 lbs. During the next two days the loss was but 2½ lbs., while it should have been as much as during the previous interval. Probably damper or colder weather made the difference. If he had weighed the hive each day for a week longer he would have found them losing all this time more than was necessary for their subsistence, probably causing a shrinkage of 5 lbs. more, reducing his 19 to 14 lbs.

2. When the bees had completed evaporating that syrup in cool damp weather it still contained at least 25 per cent of water, still reducing the amount to 11½ lbs., or 55 per cent of the sugar fed. When the bees had this "honey" capped, the amount was still more reduced.

I am very glad to get his report, as I had contemplated feeding syrup next fall for winter feed, because I thought it cheaper than honey. I think Mr. Alexander loses too much by extracting and feeding back; and his plan evidently unduly excites and wears out his bees, and he can sufficiently stimulate breeding in a way that will save stores and not be so hard on the bees.

Lander, Wyoming. I. W. BECKWITH.

HOW TO FASTEN FOUNDATION TO HORIZONTAL WIRES.

On a cool morning place your frame upside down on the table. Slip the foundation clear down into the groove, but in such a way that every second wire will be on the opposite side. It is easy when the wax is cool. Leave it that way till the day gets warm and the wax soft; then press in the wedge strips; lay the frame down; spur the wire down, first on one side and then the other.

Enumelaw, Wash., Dec. 29. A. BRUHN.

[Your plan is perfectly feasible; in fact, we believe it is the only right way for the wedge-top frames and horizontal wires.—Ed.]



TUBERCULOSIS AS A DISEASE OF THE MASSES.

Oh how I do love good books! and I love the good men and women who give the world good books at reasonable prices. You know I have had considerable to say of late in regard to the "great white plague" (probably because of the dear sister who has been thus afflicted*), and that is why I have been so eagerly watching for reports regarding the efforts of our great doctors to combat it. Well, one of my "happy surprises" was to get hold of Dr. Knopf's prize essay. It is published by Fred P. Flori, 514 East 82d St., New York, and much credit is due Mr. Flori for giving the world such a beautiful book for only 25 cts. paper, 50 cts. cloth. There are 104 pages and 30 illustrations, some of them beautiful half-tones, and I rejoice to learn that the book has *already* been translated into 21 different languages.

The motto of the book, given on the cover, is "To combat consumption, as a disease of the masses, successfully, requires the combined action of a wise government, well-trained physicians, and an intelligent people." The book should be read by everybody, and everybody will be pretty sure to read it after getting once well started. It should be read by all, because the ways of living that stamp out consumption will stamp out a hundred other ailments as well. It is along the lines T. B. Terry and myself have been urging for some time past. Plenty of air, and cool outdoor air at that, is the great theme. I told you last winter and spring, or tried to tell you, that the best place for *chickens* was not an *apartment* warmed up by steam-pipes, and I felt then and feel now that God was revealing it to me that *human beings* should not be warmed by warm apartments. If you can not do any better, perhaps it is better to be warmed thus than to suffer with the cold. If *obliged* to sleep in a warm room, fix something so you can sleep with your head out of the window or on the window-sill with the window up.

The book contains several pictures of arrangements of this kind. A large part of the book (and several illustrations) is devoted to doing away with indiscriminate spitting on the floors and sidewalks, and *pocket spittoons* for consumptive people are described and illustrated. Humidifiers for correcting too dry an atmosphere indoors are described and illustrated. Here we have "Terry" again.

The matter of diet is fully discussed by the

* I am extremely happy to inform all inquiring friends that this sister (Mrs. C. D. Gardner, Manistee, Mich.) is *very much* better, and she has just written me that she doesn't seem to mind the winter weather at all, so far, and that she weighs more than for a number of years.

most able physicians of the world, and the whole book, in fact, as I understand it, is the result of a *congress* of the best medical talent of the world. I am sure great good would come from using this book as a textbook in schools; and if the world were compelled to read it and *live by it* I think it would do more to lessen sickness, pain, and death, than any one thing that has ever been done since the world began. It is a significant fact, and one that points plainly to the trend of the times, that *no medicine* is recommended at all. A tremendous protest is made against liquor, tobacco, and stimulants of every kind.

Reader, if you are a friend of humanity help Fred Flori to put this book in the hands of a suffering world, and *do it quick*.

I submit, in closing, some clippings from different pages:

There is no doubt that alcoholism must be considered the greatest enemy of the welfare of a nation, the most frequent destroyer of family happiness, the ruination of mind, body, and soul, and certainly the most active coöperator of the deadly tubercle bacillus or germ of tuberculosis (consumption).

In families in which there is a fear of hereditary transmission of the desire for strong drink, even the mildest alcoholic drinks should be absolutely avoided. It would also be best if all people so predisposed, or who may have acquired only the occasional desire for drink, would never smoke, for experience has taught that attacks of dipsomania (periodical sprees) are often caused by an excessive use of tobacco.

The love of nature and life in the open air should be more cultivated. In the proportion in which this is done, tuberculosis will decrease.

At the International Tuberculosis Congress which convened in Paris in 1905, the American medical profession was represented by an official delegation appointed by the President of the United States, composed of Drs. Beyer, Flick, Jacobs, and Kropf. There were also delegates from the various medical centers, among whom were such men as Brannan, of New York; Lowman, of Cleveland; McCarthy, of Philadelphia; Pottenger, of Los Angeles, etc.

At the closing session of this congress an invitation was given to have the next Tuberculosis Congress meet in Washington in the fall of 1908. That will be the first time that this distinguished body will honor our country by its presence; and the American medical profession as well as the public at large should rejoice in the distinction and the prospect of having the greatest minds engaged in the combat against the white plague gathered at our national capital.

The first executive order with a view to preventing the spread of tuberculosis among the employees of the government by a president of the United States was issued by Theodore Roosevelt, Feb. 23, 1906.

A sanatorium should not only be a place where a patient becomes cured, but also a place where he should learn some lessons for the future. All that he will have learned from the rules and regulations, and the advice of the physician concerning how to protect himself and others from contracting the disease, how not to take cold, and how not to lose what he has gained, are precious lessons which he will take home with him.

MY 1908 CHICKEN STORY.

Now, dear friends, even if this is to be a "chicken story," and perhaps a good deal of it specially for the children who read GLEANINGS, I think it may pay you all to read it, for in it I shall tell you a good deal about Florida, touching on it as a place for invalids, tuberculosis, lettuce-growing, and perhaps automobiles, and, may be, *flying-machines* also.

On page 63, Feb. 15, 1907, I told you about a White Leghorn hen that would not only

lay eggs and hatch chickens the year round, winter and summer, but that it was her regular habit to commence laying again when the chicks were only two or three weeks old; and by the time she had a nest full she weaned her chicks and commenced to set again. If I didn't tell you this last part, it is because I neglected to do so. I tried to buy this remarkable hen, but she was not for sale; but I told you how I did succeed in buying five of her pullets, because they *persisted* in flying over the fence and getting out of the yard. I told you last winter of my plan to develop this valuable trait in watching the five pullets and their progeny. With the cheap incubator and sitting hens, I secured something like 100 chickens; but a large part were roosters, and many of the pullets were more or less colored; and as I wanted my new strain to be all white I asked Mr. Shumard to send me only the white pullets. He therefore shipped me 26 pullets and 2 roosters. On p. 44, Jan. 1 this year, you will see a report of *one* of these five white hens. Sure enough, she began to cluck almost as soon as she was let out with the other 25; but she kept on clucking (probably because she was separated from her 20 chicks before it was time to wean them), even while she laid an egg every day. Now please turn to p. 498, April 1, 1907, and read the article about "fighting mothers." I soon found, by her leg band, this hen that clucked every day while she laid was the fighting mother of last winter, and I soon found, also, that she was the acknowledged boss of the ranch. Young or old roosters included, cleared the way when she came along. This winter I have a 66-egg Cyphers incubator, besides the old cheap one; and as our people in Ohio had shipped me a new brooder they wanted me to try in Florida, I made no provision for my chicks.

When the chicks began to hatch, the brooder hadn't reached here, and I had been unable to coax a single one of my 26 hens to get broody. The day *after* the chicks were out, this "fighting mother" I have been writing about was on her nest when I went to gather the eggs. She not only "flatly refused" to vacate, but came so near taking several "mouthfuls" out of the back of my hand that I thought I should have to back out. She stayed on the nest over night—just *one* night, mind you. When I spoke of giving her some of the chickens from the incubators Mrs. Root (and the neighbors whom we consulted) said she would kill them, *sure*. I suppose you all know there has been a lot said and written about introducing queens. Well, I think I can tell you something about introducing "day-old chicks." I took one chick first, the one that first broke the shell. I tossed him up against the hen; but as she paid no attention to him he soon traveled back out of the barrel where she was sitting. Just about sundown I tried again. I took a dozen chicks and tossed them one after another over behind her; but she apparently paid no attention to the poor motherless waifs. Mrs. Root said, "There! didn't I tell

you that no hen would take chickens when she has been sitting only one night?"

Right here something happened. Let me digress a little. In some one of the States a law was passed requiring that not only should automobiles stop when horses seem fractious, but that the driver should say "soothing words" to the frightened animal. One of the automobile journals had a good deal of merriment about the "soothing words," and suggested the law-givers should furnish some samples of the words to be used. Well, that Leghorn hen, after considering the matter a little time (as any *good* and *wise* mother should), evidently decided in her wise little head to adopt the newcomers, even if the whole thing was rather premature. She uttered a few "soothing words" to those poor "orphlings" that had never seen a hen before nor heard a cluck. The effect was electrical. They responded in a shout of joy. Of course, it was a very small shout; but the language on both sides was the method of communication that came straight from the great God above. There were 73 in the two incubators, and we gave her about half, that night, and the rest the next day. It is now the wonder of the neighborhood to see her march about with her flock. The second night it was so cold there was ice on the boards; but she cared for them all without a loss. They huddle under and over her, and around her, and keep the whole inside of the barrel at nearly brooder temperature. Mr. Rood looked into the barrel one evening and declared we must have a "flashlight" photograph of the happy family. As nearly as I can make out, they keep slowly changing places during a cold night, much as the bees in a cluster change places. Those that get too warm come out in front and let the chilly ones go back.

Owing to the unusually fine weather and abundant rains, lettuce has been rather a drug in the northern markets, and Mr. Rood has almost a quarter of an acre of the finest "Big Boston" head lettuce I ever saw, with no market for it. As fast as the heads threaten to burst I am taking them by the wheelbarrowful and giving them to my 25 laying hens. Yesterday I got 19 eggs and 20 to-day. A barrowful lasts them hardly two days; and not only is their ration of grain greatly decreased, but as long as they have plenty of lettuce all other garden stuff is unmolesied. You can throw open the gate to the poultry-yard and let them have free range, thus saving expensive fences of netting if you give them plenty of grain and water, and all the lettuce they want. With eggs at 35 cts. per dozen I am inclined to think it will pay to grow lettuce for poultry. My flock of 70, a week old, will consume two good-sized heads a day. I slash it with a sharp caseknife across two ways and then across the top, so as to shred it small enough for them to swallow, and they seem to thrive on it with all the "baby-chick food" they will take.

OUTDOOR AIR FOR CHICKENS AND PEOPLE.
 Before I knew I had a sitting hen I prepared a home-made brooder by covering a square five-gallon can with old clothing and

filling it with hot water. It was placed on its side a few inches over the floor, and curtains put around it in my incubator cellar. The cellar keeps pretty near 70 degrees day and night, with a pretty good supply of fresh air, and the chicks did very well until I gave them to the hen. Mrs. Root protested, however. She said they wanted the outdoor sunshine, and, above all, they needed a *mother*. She doesn't believe very much in lamp-heated brooders. Now listen a minute. Cyphers "Hints" says the temperature of the brooder should be about 95 the first week; 90 by the end, and 85 the second week, and so on. The chicks in that barrel were running all over the dooryard when the temperature was below 50, and they were less than a week old. Some of them would scud out when it was only 40 early mornings, and then back under the hen, or into the "cluster" in front of her, until they warmed up for another trip. I wish you could all see my outdoor chicks, and then take a look at those in the best artificially warmed poultry establishments. You may recall that I visited several of them around New York city last April. If a sitting hen can "handle" 70 chicks in Florida in *January*, what does anybody want of a brooder? Another thing: The "books" tell us gravely, "Chicks should be kept in the brooder 6 or 8 weeks," according to the weather.

Now, dear reader, we come to something of more importance than the chicken business of the whole world, even if it is the most important rural occupation. Thousands of human beings are kept in palatial "brooders," warmed by artificial heat, and breathing bad air, when there isn't a shadow of an excuse for it. Elsewhere I have made editorial notice of a wonderful book on tuberculosis by Dr. S. A. Knopf. Some of the beautiful pictures of the way they cure consumptives (outdoors in the pine woods) brought vividly to mind the picture of those 70 chicks around the mouth of their barrel. The multitude of bright little eyes, and the happy contented "cheep, cheep" (even with a temperature of 40 outside), are never found in brooders warmed with a lamp at a temperature of 85 to 95—that is, unless I am very much mistaken.

While I was watching and enjoying my busy mother with her flock of 70, Mrs. Root said, "There is a fine automobile coming up the road; don't you want to stop and see it?" Please bear in mind it was not so *very* long ago that automobiles were my latest hobby. I considered a minute, and then replied, "Sue, to tell the truth, *just now* I would not trade my 'fighting mother' hen, with her brood of 70, for their whole outfit—that is, for my own personal use."

In conclusion, if other hens can not be made to do what this hen does, then we should "get busy" and develop a strain of fowls that will lay and sit, and take charge of large broods from the incubator, and work cheaper and *do better work* than any artificial mother ever did, or ever can do. Veritable "Florida flying-machines" they will be.



“Put Yourself in His Place”

PUT yourself in the place of the man behind the desk—the man who directs the work of others—the man who is a power in a big city.

- You can do it—
- You can be as big a man as he—
- You can make as much money as he—
- You can enjoy the same advantages as he—
- If you get the knowledge that has put him in his place.

We will send you that knowledge in compact, easily accessible form—easy to read, and with everything fully explained in a plain, simple and easy way.

You can get all this in the **CYCLOPEDIA OF ENGINEERING**—

On free trial, express prepaid, for 5 days' examination at your leisure in your own home.

There is nothing for you to pay in advance. If you do not find these books all we claim them to be, simply return them at our expense and you have not paid us a cent, and do not owe us a cent.

If you want to keep them—the price, for a limited time only, is \$14.80, instead of \$36.00, less than half the regular price—and you can pay the \$14.80 on small, easy, monthly payments.

After you have studied these books in your own home in your spare time, you will have the best foundation for becoming a big man in a big city.

The Cyclopeda of Engineering gives you all the knowledge that working engineers have gained by years of hard work and close study.

The Cyclopeda of Engineering is the most practical—the most complete—the most easily understood work ever published on Engines—Steam, Gas and Oil,—Marine Engineering—Electricity—Automobiles—Steam Engines—Boilers—Pumps—Refrigeration—Heating by Furnace—Steam and Hot Water, and a full list of other engineering subjects.

The greatest authorities, the most practical experts, the best known engineers have helped to make this great work the best in the world for home study.

The “Cyclopeda of Engineering” is made up from the regular courses of the American School of Correspondence, and arranged especially for a practical reference library. It was written by expert teachers and working engineers who have had years of experience in the lines.

Among these men are Louis Derr, A. M., S. B., Associate Professor, Mass. Institute of Technology; F. B. Crocker, E. M., Ph. D., Head of De-

partment of Electrical Engineering, Columbia University; L. S. Marks, S. B., M. M. E., Assistant Professor of Mechanical Engineering, Harvard University; C. L. Griffin, S. B., Mechanical Engineer, Semet-Solvay Co.; W. B. Snow, S. B., Mechanical Engineer, B. F. Sturtevant Co.; L. V. Ludy, M. E., Professor of Mechanical Engineering, Purdue University; C. L. Hubbard, S. B., M. E., Consulting Engineer on Heating, Ventilating, and Lighting; G. L. Fowler, A. B., M. E., Consulting Engineer; L. K. Sager, S. B., Patent Attorney and Electrical Expert; F. W. Turner, Instructor in Machine Shop Work, Mechanic Arts High School, Boston.

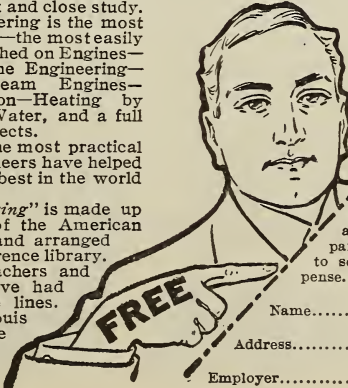
The six massive volumes (page size 7x10 in.) are bound in half red morocco, 3,000 pages, over 2,000 diagrams, sections, tables, formulae, etc. Complete sets of test questions in every volume, thus combining the best features of a text book and reference work.

It will only cost you a postage stamp to send us the free coupon.

Sign and send it to us now and save \$21.20. We have only a limited number of these books that we can sell at this very low price—so let us hear from you at once before they are all gone.

Address O. C. MULLER, State Secretary, Dept. 154, Administration Building,

AMERICAN SCHOOL OF CORRESPONDENCE CHICAGO



Free Coupon
Bee Cult.
2-15-08

American School of Correspondence, Chicago.

Please send set Cyclopeda Engineering for 5 days' free examination, all express prepaid. I will send \$2 within one week and \$2 a month until \$14.80 is paid; otherwise I will notify you to send for the books at your expense.

Name.....

Address.....

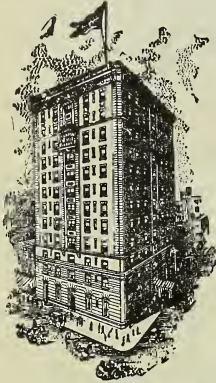
Employer.....

Hotel Cumberland

NEW YORK

S. W. Cor. Broadway at 54th Street

Near 50th St. Subway and 53d St. Elevated, and accessible to all surface lines



Ideal Location.
Near Theaters, Shops,
and Central Park.

New and Fireproof
Strictly First Class in
Every Respect

All Outside Rooms.

No Carpets.
and Hard-wood Floors
Ad Oriental Rugs.

European Plan.

Transient rates, \$2.50 with bath, and up.

Restaurant Unexcelled.

Prices Reasonable.

Send for Booklet.

Harry P. Stimson
Formerly with Hotel
Imperial.

R. J. Bingham
Formerly with Hotel
Woodward.

Let this Free Book tell you how to double your Potato Money



You can learn of the one way to plant your potatoes cheapest, how to save seed and soil, how to double the profit of every acre of your potato land.

You can get this book free for your name on a postal card. It will tell you all about the proper care of potato fields, proper methods of planting and cultivation, how to save hundreds of dollars in fertilizer money alone.

It will tell you how to do all this at a cost of but one dollar. It will describe the one planter that makes this all possible—the famous Acme Hand Planter. It will place in your hands all the great, vital truths of Potato Culture, condensed and plainly written, so it is easy to read and remember them.

You will want this book to put its precepts into practice on your own farm. Send for it now. Just say on a postal, "Send me your potato book."

POTATO IMPLEMENT COMPANY,
Box 520, Traverse City, Mich.

THE "BEST" LIGHT



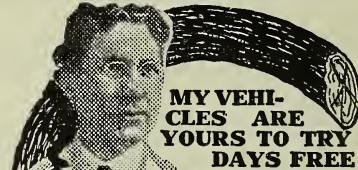
One burner will give as much light as ten ordinary oil lamps; six 16 candle power electric bulbs—six 16 candle power gas jets or facetylene gas jets. Costs 2 cts. per week. Produces a pure, white, steady, safe light. Over 200 styles. Every lamp warranted. Agents wanted. Write for catalog.
THE BEST LIGHT CO.,
306 E. 5th St., Canton, O.

EXCELL IRON and STEEL ROOFING & SIDING



Direct To You from our own factory at lowest factory prices. We are manufacturers and handle no 2nd hand nor short length stuff. Every part of our roofing and siding is made in our factory from genuine Charcoal Iron, Double Refined Puddled Iron or Steel. Put on the kind of roof that wears. Ours is guaranteed. If it isn't the best you can buy anywhere, don't pay for it. Easy to lay. No experience needed. Tell us about your building and let us quote you factory prices. Write for Metal Goods Catalog. It is free.

THE UNITED FACTORIES CO.
Dept. No. R38, Cleveland, Ohio.



MY VEHICLES ARE YOURS TO TRY 30 DAYS FREE

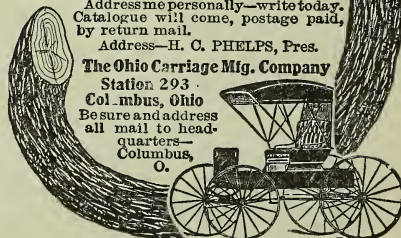
This is the plan that I adopted seven years ago, and it has been satisfactory to both my customers, and myself. In addition to that, I guarantee to save you 1/3 in the cost. I sell my SPLIT HICKORY VEHICLES direct from my factory to the user. There is no middleman's profit between us—no agent between you and me. My goods are backed up by my two big carriage factories—Cincinnati and Columbus, Ohio.

One hundred thousand SPLIT HICKORY Vehicles in use all over the United States.

Thousands of customers everywhere who say they saved money in dealing with me. Write for my FREE 192-page Catalogue today. A postal will get it. Runabouts, Driving Wagons, Top Buggies, Automobile Seat Driving Wagons and Two-in-One Top Buggies, Carriages, Surreys, Spring Wagons and Harness, all at prices guaranteed to save you from 33% to 50%.

Address me personally—write today. Catalogue will come, postage paid, by return mail.

Address—H. C. PHELPS, Pres.
The Ohio Carriage Mfg. Company
Station 293
Col. mbus, Ohio
Be sure and address all mail to headquarters—Columbus, O.



Make your garden pay double

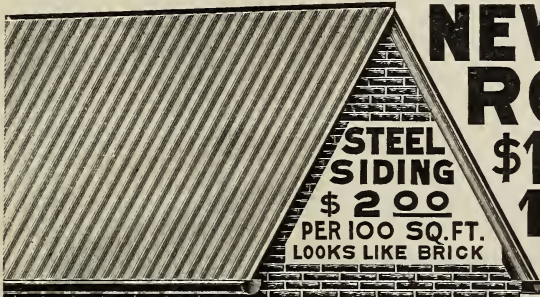
Planet Jr. Farm and Garden Tools save time and labor, take the place of expensive "help", and prepare for a bigger, better crop. They do great work and they last long—made of the finest materials for the purpose, and guaranteed. They pay for themselves over and over again.

No. 25 Hill and Drill-Seeder, Double-Wheel Hoe, Cultivator and Plow combines every useful tool in one strong, light, easy-running, simply-adjusted implement—opens the furrow, sows the seed in drills or in hills 4 to 24 inches apart, covers, rolls, and marks out the next row and does thorough work as a double-wheel hoe, cultivator and plow.

Planet Jr. 12-tooth Harrow, Cultivator and Pulverizer is a great tool for berry growers and market gardeners—invaluable wherever fine close work is needed. The twelve chisel-shaped teeth leave the ground in the finest condition. Turns hard work for three men into easy and better work for one. Write today for illustrated 1908 catalogue describing our 45 kinds of farm implements including Wheel-Hoes, One-and Two-Horse Cultivators, Harrows, and Orchard and Beet-Cultivators. S. L. Allen & Co. Box 1106E, Philadelphia, Pa.



PLANET JR.



NEW STEEL ROOFING

\$1.50 PER 100 SQ. FEET

STEEL SIDING \$2.00 PER 100 SQ. FT. LOOKS LIKE BRICK

Most Durable and Economical Known

Easy to put on, requires no tools but a hatchet or a hammer. With ordinary care will outlast any other kind. Thousands of satisfied customers everywhere have proven its virtues. Suitable for covering any building. Also best for ceiling and siding. FIRE-PROOF AND LIGHTNING-PROOF. Cheaper and more lasting than shingles. Will not taint rain water. Makes your building cooler in summer and warmer in winter. Absolutely perfect. Brand new. \$1.50 is our price for our No. 15 grade of Flat Semi-hardened Steel Roofing and siding, each sheet 24 in. wide and 24 in. long. Our price on the Corrugated, like illustration, sheets 22 in. wide and 24 in. long, \$1.75. For 25c per square additional we will furnish sheets 6 and 8 feet long. Steel Pressed Brick Siding, PER SQUARE, \$2.00. Fine Steel Beaded Ceiling, PER SQUARE, \$2.00. Also furnish Standing Seam and "V" Crimped Roofing. At these prices

WE PAY THE FREIGHT to all points east of Colorado except Okla., Tex. and Ind. Ter. Quotations to other points on application. **SATISFACTION GUARANTEED OR MONEY REFUNDED.** We ship this roofing to any one answering this ad. C. O. D., with privilege of examination if you send us 25 percent of the amount of your order in cash; balance to be paid after material reaches your station. If not found as represented, we will cheerfully refund your deposit. **ASK FOR CATALOG NO. C. K. 688.** Lowest prices on Roofing, Eave Troughs, Wire Pipe, Fencing, Plumbing, Doors, Household Goods and everything needed on the farm or in the home. **WE BUY OUR GOODS AT SHERIFFS' AND RECEIVERS' SALES** Chicago House Wrecking Co., 35th and Iron Sts., Chicago



"A Kalamazoo Direct to You"

We have more than 100,000 satisfied customers in more than 17,000 cities, villages and towns in the United States who have each saved from \$5 to \$40 by buying a Kalamazoo stove or range on

360 DAYS APPROVAL

direct from our factory at actual factory prices. No stove or range has a higher reputation or gives better satisfaction. You run no risk. You save all dealers' profits. We pay the freight.

Send Postal For Catalog No. 416 and see list of towns where we have satisfied customers.

Kalamazoo Stove Company, Mfrs., Kalamazoo, Mich.

Our patent oven thermometer makes baking and roasting easy.



ENJOY YOUR GARDEN Our New Iron Age Book tells how to avoid the tiresome part of gardening and enjoy its recreation with the work left out. Full of helpful garden hints. FREE on application. **Bateman Mfg. Co. Box 120G Greenloch, N.J.**

IRON AGE TOOLS

PATENTS No attorney's fee until patent is allowed. Write for "Inventor's Guide." Franklin H. Hough, Loan & Trust Bldg., Washington, D.C.



Quality of 35 Years Breeding

A WELL bred horse is always a beautiful sight. Admiration grows as we note one point after another. But then this wonderful horse did not just happen to be so beautiful and useful.

It's the result of years of careful breeding.

And so it is with everything that has merit.

Theoretically—on paper—it always seems so easy to reach perfection with a few years experience. But it always lengthens from 10 to 20, 30 to 40 years before perfection is attained.

And that's just the reason that Lowe Brothers "High Standard" Liquid Paint has reached the point of leadership.

It has taken 35 years of careful painstaking effort to make it the best paint produced at the cost of time and money.

Extreme care has been taken to get only the best ingredients that could be obtained.

It is a well bred paint. Bred to a degree of sound idealism.

THE LOWE BROTHERS COMPANY, 450-456 Third St., Dayton, O.
Paintmakers Varnishmakers

NEW YORK CHICAGO KANSAS CITY

It's a *merit*-paint. And the "Little Blue Flag" is the mark that signifies *merit* in paint and varnish.

Thirty-five years of experience—conscientious effort and honesty of purpose is back of that FLAG.

It is YOUR guarantee of good paint and varnish—the best obtainable at any price.

Eliminate all chance of getting *poor* paint by asking for and insisting upon Lowe Brothers "High Standard" Paint.

Valuable information about paint is contained in our booklet, "Attractive Homes and How to Make Them." It's free. Send for a copy.

"The Little Blue Flag"
—Your Protection



MATTHEWS' "NEW UNIVERSAL" GARDEN TOOLS

6 TOOLS IN ONE

Seeder, marker, hoe rake, plow, cultivator, Single or double wheel. Adjustments easily made. For planting and all kinds of cultivation. Send for FREE BOOKLET of valuable information for planting and cultivating the garden and full description of these implements.



AMES PLOW COMPANY, 88 MARKET STREET, BOSTON, MASSACHUSETTS

6 Styles Seeders

Opens furrow, drops in plain sight covers marks.



Hand Wheel Plows
Rear wheel gives steadiness & ease.



Double or Single Wheel Hoe

Cultivator, Plow, Rake. Changes quickly made. Cultivate between or outside the rows. Any depth, any width.



Note High Arch and Plant Guards. Bent Oak Handles on all Tools.

SPRAY PUMPS

"TAKE OFF YOUR HAT TO THE MYERS"

MYERS

The Pump that pumps easy and throws a full flow. The cheapest pump is the best pump, that's a Myers. Pumps, Hay Tools & Barn Door Hangers. Send for catalog and prices. F. E. Myers & Bro. Ashland, Ohio.

ASHLAND PUMP AND HAY TOOL WORKS

Get The Fast-Digging IWAN POST AUGER

Throw a vray that old spade and use the double blade, fast-digging Iwan Post Auger which bores right into the hardest clay, gumbo, sand or gravel. Saves twice its cost the first week. No trouble to unload. Always sharp and lasts forever. Money back to you if you don't find it the best Auger you ever saw

Send today for FREE Book "Easy Digging," and learn all about the scientifically made, tempered-steel Iwan Post Auger. IWAN BROS., Dept. R, Sireator, Ill.

SAVE YOUR BACK

Save time, horses, work and money by using an Electric Handy Wagon

Low wheels, broad tires. No living man can build a better. Book on "Wheel Sense" free. Electric Wheel Co. Bx 98, Quincy, Ill.

TWO MONEY MAKERS




SCARFF'S SMALL FRUITS
 and bees are an ideal combination for bee-keepers or farmers. Order early and plant a generous quantity of these fruits. The bees pollinize them, making them produce in luxurious abundance, and at the same time increase amount and value of honey.

3 Blackberry Bushes Free. I want to prove how well-rooted, strong and vigorous my plants are. I will send free 3 fine blackberry plants, if you write for my new 1908 free catalog. Some of my customers are making over \$350 an acre with my plants. With bees you can increase that profit considerably. I sell a large variety of nursery stock, grown on an 800 acre farm. Write me to-day.

W. N. SCARFF, New Carlisle, Ohio

6

FREE

HARDY BLIZZARD BELT

To prove that our EVERGREENS are HEALTHY, HARDY and Vigorous, we offer to send SIX fine two-year-old trees, entirely FREE OF CHARGE, to every property owner who will answer this advertisement. Mailing expense 3 cts., which send or not, as you please. A postal will bring them and our catalogue which contains many COLORED PLATES of our BLIZZARD BELT FRUITS; SPECIAL BARGAINS and a mine of valuable information for fruit growers. We want to become acquainted with you, and it will pay you to get into touch with our HARDY "BLIZZARD BELT" stock and our liberal manner of doing business. THIRTY EIGHT years' experience in growing HARDY "BLIZZARD BELT" trees. Write to-day.

The Gardner Nursery Co., 26 Nursery Ave., Osage, Ia.

6

SEND
FOR
THEM
TO-DAY

EVER-
GREENS
FREE



Over half a century of fair dealing has given our products that prominence which merit deserves. Everything of the best for

Orchard, Vineyard, Lawn, Park, Street, Garden and Greenhouse

Seeds, Bulbs, Plants, Roses, Shrubs, Small Trees, Etc.

by mail, postpaid—safe arrival and satisfaction guaranteed; larger by express or freight. Hundreds of car loads of **FRUIT AND ORNAMENTAL TREES**. If in want of Fruit or Ornamental Trees, Shrubs, etc., send for Catalogue No. 1, 112 pages. If Seeds, Bulbs, Roses, Palms, Ferns, Geraniums and Greenhouse Plants in general, Catalogue No. 2, 163 pages; both **FREE**. Immense stock of superb and choice **CANNAS**—the queen of bedding plants. **PEONIES** and other perennial hardy plants in large supply. Direct deal will insure you the best and save you money. 64 years. 1200 acres, 44 greenhouses.

THE STORRS & HARRISON CO., Box 139, Painesville, Ohio.

SEEDS

of the **Burpee-Quality** cost but little more than the usual kind, but are worth much more! To convince you that this is true, let us have a talk together. We have spent months of labor and thousands of dollars on

The BEST SEED CATALOG we have ever issued.

It is a **Book of 172 pages** with new half-tone illustrations from photographs and beautiful colored plates. Shall we mail you a copy? It will cost you nothing, if you will kindly give a fair hearing to our claims for your patronage. **Write TO-DAY!**

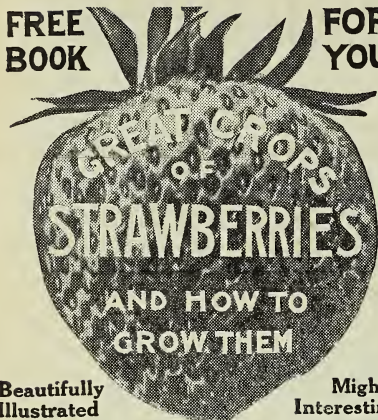
W. ATLEE BURPEE & CO., Seed Growers, PHILADELPHIA, PA.

SEED CORN

DIAMOND JOE'S BIG WHITE. Earliest-maturing Big-eared Corn in the world. Made 146 bushels per acre. It costs but 25 cts. per acre for seed. Big illustrated catalog of seed corn and all kinds of Farm and Garden Seeds mailed **FREE** if you mention this paper.

RATEKIN'S SEED HOUSE, SHENANDOAH, IOWA.

FREE BOOK FOR YOU



Beautifully Illustrated

Mighty Interesting

If you want to know how to grow big crops of big red strawberries and to get big prices, send for our 1908 book. It tells all about soil preparation, setting, mating, pruning, cultivating, spraying, mulching, picking, packing and marketing. All of these essential features and many more are explained in such a way that you can't go wrong. It was written right out in the strawberry field by a man who has made a fortune growing strawberries, and he tells you just exactly how he does things. Send your address. That's all. The book is free.

R. M. Kellogg Co., Box 400, Three Rivers, Mich.

110 VARIETIES STRAWBERRIES

If you want Strawberry Plants the best, strongest, most vigorous and most prolific that can be grown in a good, favored strawberry climate, I am selling that kind at reasonable prices. Millions of them packed to carry anywhere. Also other small fruit plants and special seeds. My Free Catalogue tells about them and gives the price. If interested, write for it today. Address

W. F. ALLEN
35 Market St. Salisbury, Md.

A beautiful colored plate of our **New Eaton Red Raspberry**

and our strawberry catalog of valuable information about varieties with instructions for beginners. Free to all.

THE FLANSBURGH & POTTER CO.,
Leslie, Michigan.



TRADE MARK BERRY PLANTS

We are headquarters for plants of the new "Oswego" strawberry and 50 other best new and old varieties. Also the "Plum Farmer" raspberry and other desirable kinds of Raspberries, Blackberries and other Fruit plants, etc. 24 years experience. Highest awards at World's Fair. We invite correspondence. Catalog free.

L. J. Farmer, Box 808, Pulaski, N. Y.

PATTEN'S TESTED TREES

Seven splendid new varieties hardy Northern grown apples. Specially adapted to the Northwest. Winners of Wilder Medal, highest award in U. S. Rapid growers, big yielders, good keepers and shippers. Money makers for fruit growers. Also,

NORTHERN GROWN

shade and ornamental trees for group, specimen, or windbreak planting. Especially for locations where only hardy stock will thrive. For 5c for postage and packing, we will send beautiful Hybrid Perpetual Rose and illustrated catalog with full description and prices free. Charles City Nursery & Orchard Co., Box 20, Charles City, Ia.

FRUIT TREES \$5

Freight Paid, Per 100

Free from disease; all fumigated before shipping—Apple, Peach, Plum, Pear, Cherry, Carolina Poplar. Order here. Catalog Free.

RELIANCE NURSERY CO.,
Box 816, Geneva, N. Y.

FIFTY MILLIONS OF

Hardy Evergreens \$4.00 and up per 1,000. 50 wonderful bargain lots for 1908, quality the highest, prices the lowest of all, \$1.00 to \$10.00 per 100 prepaid. Pedigreed trees, not wild, but **NURSERY GROWN AND GUARANTEED.** Also full line Fruit, Forest, Shade, Ornamental Trees and Shrubs. Get my Free Catalog and Bargain Sheet. Don't buy till you've seen it. A beautiful Red Cedar Tree free with every order.

D. Hill, Evergreen Specialist, Box 87, Dundee, Ill.

TWO SUPERB NEW FRUITS

FREE

With **ST. JOSEPH MO**

THE FRUIT-GROWER

Send for a FREE Three Months Trial to America's leading fruit paper, The Fruit-Grower, and we will mail booklet telling how to get a tree of Delicious Apple and a vine of Banner Grape, FREE. Two of the best fruits ever introduced, hardy all over the country, finest quality. Delicious Apple sold last season at \$6 a box. If you have only a few trees or plants you need this paper. Tells all about fruit—how to plant, cultivate, prune, spray, pack, market. Regular price \$1.00 a year, and two new fruits included free, but will make special offer if you answer this ad.

THE FRUIT-GROWER, Box 307, St. Joseph, Missouri

Send your paper three months FREE on trial, after which I will notify you to stop or become a subscriber.

Name _____

Town _____ State _____

GOOD SEEDS THE BEST EVER GROWN



Prices lowest of all. Postage paid.

A lot of extra packages given free with every order of seeds I fill. Send name and address for my big catalog. Over 700 engravings of vegetables and flowers.

R. H. SHUMWAY, Rockford, Illinois

TREES THAT GROW

Apples 5c, Peach 5c, Plums 12c, Cherries 17c Best quality, good bearers, grafted stock, not seedlings. Concord Grapes \$2.50 per 100, Forest Tree Seedlings \$1.00 per 1,000 up. We pay the freight.

GERMAN NURSERIES & SEED HOUSE
CAREL SONDERENBERG, Prop.

We have a complete line of Vegetable, Flower and Farm Seeds. Our large illustrated catalog free.

GERMAN NURSERIES,
Box 143, BEATRICE, Neb.

450,000 TREES

200 varieties. Also Grapes, Small Fruits etc. Best rooted stock. Genuine, cheap. 2 sample currants mailed for 10c. Desc. price list free. LEWIS ROESCH, Box 1, Fredonia, N. Y.

BOOK "More Corn to the Acre" FREE

If you send names of 5 corn or stock growers and 10c for a year's trial to Farm & Stock, the only monthly devoted to corn and live stock. Regular rate \$1, but we make this offer to get list of wide awake growers.

Farm & Stock, 824 Charles, St. Joseph, Mo.

EGGS FROM BONE

Green cut bone doubles egg yield. More fertile eggs, vigorous chicks, early broilers, heavy fowls.

MANN'S LATEST MODEL BONE CUTTER

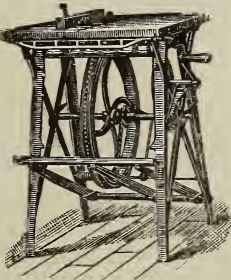
10 days free trial. No money in advance. Send it back at our expense if you don't like it. Cat'g free.

F. W. MANN CO., Box 37, Milford, Mass.

BARNES' HAND and FOOT POWER MACHINERY

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

MACHINES ON TRIAL
Send for illustrated catalog and prices. Address **W. F. & JNO. BARNES CO.** 545 Ruby Street, ROCKFORD, ILLINOIS.



PATENTS.

Twenty-five Years' Practice.

CHARLES J. WILLIAMSON,

Second Nat'l Bank Bldg., Washington, D. C.

Patent practice in Patent Office and Courts.
Patent Counsel of The A. I. Root Co

Peach Trees

Large stock; all straight, healthy.

well-rooted trees. Free catalog. Freight paid. Agents wanted. Special Prices to clear ground.

W. T. Mitchell & Son, Beverly, O.

ALSIKE CLOVER SEED

Medium red, and large; also timothy seed for sale. Write for samples and prices. Catalog of apiary supplies free. F. A. SNELL, Milledgeville, Carroll Co., Ill.

15 CENTS for trial 13 weeks. In this illustrated national weekly all the important news of the world is stated clearly, fairly, and briefly, for busy readers. Many special features of great interest. It is sincere, reliable, entertaining. THE paper for the home. \$1 a year; takes place of \$2 to \$3 papers. Try it, 13 weeks for 15 cts. THE PATHFINDER, Washington, D. C.



Westwood Red-clover Queens

Are the bees that got the honey in 1907. Better try them for 1908. Nuclei and full colonies a specialty. Price list on application.

HENRY SHAFFER, 2860 Harrison Ave., Sta. L, Cincinnati, O.

PHARR'S GOLDENS

took first prize at three exhibits in 1907. We also breed Carniolans, three-banded Italians, and Caucasians, bred in separate yards and from the best breeders obtainable; guarantee safe delivery and fair treatment. Untested, \$1; tested, \$1.25. Address New Century Queen-rearing Co., Berclair, Tex. John W. Pharr, Prop.

Notice to Bee and Poultry Men

When in want of the best winter case, incubator, brooder, and shipping-coops, write me. It will pay you.

R. H. SCHMIDT, SHEBOYGAN, WIS.

FOR SALE.—Big stock bee-supplies, small profit; 8% discount for the next 60 days, to make room for 1908 stock. Take Root Co.'s and Marshfield Mfg. Co.'s illustrated price list for 1907, if you have one; if not, send for them at once. S. D. BUELL, Union City, Mich.



FOR SALE.—It will pay to get our special proposition. A. G. WOODMAN & CO., Grand Rapids, Mich.

LEE

All leading varieties of standard-bred chickens, ducks, geese, turkeys, and peafowls. Send 4 cts. for large catalog.

J. J. BRENNER, D. 12, Mankato, Minn.

40 BREEDS. Fine pure-bred chickens, ducks, geese, and turkeys. Northern raised, hardy, and very beautiful. Largest poultry farm in the Northwest. Fowls, eggs, and incubators at low prices. Send four cents for fine 76-page 14th Annual Poultry-book.

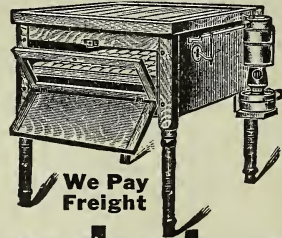
R. F. NEUBERT, Box 778, Mankato, Minn.

Grand Sure Hatch Catalog Free!

SEND NO MONEY, but simply say on a postal card, "Send me a **FREE** copy of the **Big New 100-Page Illustrated Sure Hatch Book**," and give your name and address. By return mail we will send you the greatest book on Incubators, Brooders and Poultry Raising that you ever saw given away.

For the benefit of the poultry raisers of the world, we are putting out the finest, most complete, most practically helpful, interesting Incubator and Poultry Book ever printed, and give the **whole edition away**. We want to make you a present of one of these grand books and catalogs.

The Sure Hatch Book is not only a Complete Handbook of Poultry-Raising Information, but tells all about the



We Pay Freight

Sure Hatch Incubator

which has the **highest hatching record** and **lowest selling price** of any incubator on the market. Over 140,000 Sure Hatches are turning eggs into big round dollars for poultry raisers from Maine to California and from Canada to the Gulf, as well as other parts of the world. This is the incubator that **runs itself** and **pays for itself with one hatch**. A test will prove it. We guarantee the Sure Hatch for **5 years**, and make a wide-open proposition to take it back at **our expense** if it fails to make good on any claim we make for it. The same guarantee applies to our unequaled Brooders. **We pay freight.**

Send for free copy of the **Sure Hatch Book** and our liberal 1908 special offers. Write at once—postal cards are cheap, and the book alone is worth \$1.00. **Tell your friends to write.**

Sure Hatch Incubator Co., Box 107, Fremont, Neb., or Dept. 107, Indianapolis, Ind.

\$750

Complete 50-egg all metal Hatching & Brooding plant for only \$7.50. The only machine made that does the work in the **natural way**. Once filling the lamp hatches the eggs and broods the chicks

METAL MOTHERS

Our new system \$1.00 Brooder works to perfection. No danger of fire, overheating or chilling the chickens. Let us tell you about our new way of keeping poultry to get the largest profits. Catalogue free.

Cycle Hatcher Co., 223 Wm. St., Elmira, N. Y.

Poultry Pays

a larger profit for the money invested than any other business. Anybody can make a success without long training or previous experience.

Our Big New Free Poultry Book

tells in detail how to start. Explains why the double heating system of Reliable Incubators and Brooders have kept them on top for 26 years. Shows why you will get bigger hatches—save time and money. Write today for book.

Reliable Incubator & Brooder Co. Box B49 Quincy, Ill.

125 Egg Incubator and Brooder

Both For \$10

If ordered together we send both for \$10 and pay freight. Hot water, copper tanks, double walls, double glass doors. Our free catalog describes them.

Wisconsin Incubator Co., Box 97, Racine, Wis.

Famous Invincible Hatchers From \$4.00 Up

The safe way to buy an Incubator is on a **Real Free Trial**. Invincible Hatchers are sold that way and results guaranteed. Brooders, Poultry Houses and supplies all at very low prices. **224-page book Free.** Write to-day. **The United Factories Co., Dept. J38, Cleveland, O.**



Hot Air or Hot Water

Miller Pays Freight

A Free Book About Incubators

We issue the best book ever written on incubators—written by a man who has spent 26 years in perfecting them—by the man who made the Racine. It tells facts that you must know to get the right incubator. Don't buy without reading it, for the book is free. **We Pay the Freight.**

Racine Hatcher Co., Box 114, Racine, Wis.
Warehouses: Buffalo, Detroit, Kansas City, St. Paul.

You Haven't Got The Lowest Prices Until You Get Mine

I quote you the lowest prices on the best Incubators and Brooders. I know how to build them.

IDEAL Hot-Air and Hot-Water INCUBATORS and BROODERS

are made to give best results. Send for my handsomely illustrated free book, "Poultry for Profit." Read my trial offer. See how I protect you. **J. W. MILLER COMPANY, Box 43 FREEPORT, ILL.**





HAVE YOU SENT YOUR NAME TO JOHNSON?
INCUBATOR MAN



You are missing it if you have not a copy of Johnson's book describing in detail the famous

"Old Trusty" Incubator

Sold on a positive guarantee to be absolutely automatic; to maintain an even temperature in every part of the egg chamber, and to give hatches of 75% or better; to consume less oil, and to give less bother than any other incubator in the world. Sold on

40, 60 or 90 Days Trial and Johnson Pays the Freight

Write today for Johnson's big Free book. A poultry book by a man who knows. 176 pages. Every page a poultry sermon. 300 pictures and more good chicken sense than you ever saw before in any book. Send your name today to

M. M. JOHNSON, CLAY CENTER, NEBRASKA

Model Dollar Makers
 No machines you can buy for your farm will earn as many dollars as **MODEL Incubators and Brooders**

From its handsome, warmly padded case, and its perfect heating and ventilating systems, its accurate, powerful regulator, the Model Hatcher stands unequalled. The Model Brooders, with their substantially made cases, their diffusive heating system that imparts a gentle warmth, together with copious ventilation, raise strong, healthy chicks.

Poultry is a profitable crop on farms where Model machines are used. If you are not making big money on your chickens, write me today for my book telling how you can. The Model equipment and methods assure success.

MODEL INCUBATOR CO.,
 CHAS. A. CYPHERS, Pres.
 350 Henry St., Buffalo, N. Y.

\$7.15

Buys the Best 120-Egg Incubator Ever Made

Branches
 St. Paul
 Buffalo
 Kansas City
 Detroit

\$4.35 Buys the Best 100-Chick Brooder
 Both Incubator and Brooder, ordered together, cost but \$11.00. (Freight Prepaid East of Rockies.) Incubator is double walled all over, copper tank and boiler, hot-water heat, self regulator, nursery, high legs, glass door. Brooder is the only double walled, hot-water brooder made. No machines at any price are better. Write for our book today, or send the price now under our guarantee and save waiting.

Satisfaction Guaranteed.

BROODER
 Belle City Incubator Co. Box 69, Racine, Wis.

BIG POULTRY BOOK FREE

No matter how many poultry books you now have, send for ours too. Contains 128 pages of 15 years' rich experience in poultry raising —also tells all about the famous

Successful Incubators and Brooders
 and shows you how to hatch and raise chicks for profit. **CATALOG FREE.** Book on "Proper Care of Chickens, Ducks, Turkeys & Geese"—10c. 50c Poultry paper, one year, 10 cents.

Des Moines Incubator Co., 190 Second St., Des Moines, Ia.

2 HATCHES FREE
 And a 5 Year Guarantee

Most liberal offer ever made. Wholesale price. \$3 to \$8 saved. Thousands of users recommend Gem Incubators and Brooders as the favorite. Book "Poultry Profit and Proof," tells why. Sent free. **THE GEM INCUBATOR CO.** Box 53. Trotwood, Ohio.

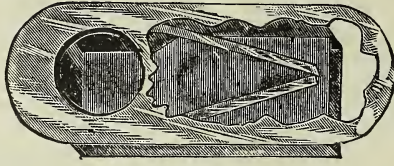
\$5.88
 WE PAY FREIGHT
 AND UP

Hatch Chickens by Steam with the EXCELSIOR INCUBATOR Or WOODEN HEN

Simple, perfect, self-regulating. Hatch every fertile egg. Lowest priced first-class hatches made.

GEO. H. STAHL, Quincy, Ill.

Send for free Catalogue.



PORTER BEE-ESCAPES

HIVE ESCAPE

When taking off surplus this is the greatest saving device. It does away with the shaking of the heavy supers, the cruelty of excessive smoking which causes the bees to uncap their honey and start robbing. Just tip the super to the angle of 45 degrees and insert the board. In a few hours it is free of bees; then take off your super. You can as well afford to be without a smoker as without the Porter Bee-escape.

PRICES

Each, 20 cts.; dozen, \$2.25; postpaid. With board, 35 cts. each; \$3.25 per 10; by express or freight.

TESTIMONIALS

They are perfect in action.—British Bee Journal.

No bee-keeper can afford to be without them.—Prof. Cook in American Bee Journal.

Worthy of highest commendation.—Eugene Secor, judge on awards, World's Fair, Chicago.

I would not do without them even if they cost five dollars apiece.—W. Muth-Rasmussen, Independence, Cal.

They are absolutely perfect. I can not tolerate my own make since using them.—John S. Reese, Winchester, Ky.

They are one of the best things ever brought into any apiary, and should be used in every bee-yard in the whole world.—Wm. McEvoy, Foul-brood Inspector, Ontario, Canada.

There is no robbing or fighting or disturbance in the apiary when the surplus honey is taken off with them. They are simply perfect.—W. Woodley in British Bee Journal.

HOUSE ESCAPE

To be used over the doors and windows in the extracting-house, or any place you wish to clear of bees. The most persistent robber can not return. Some bee-keepers make a practice of taking off the filled supers and stacking seven or eight in a pile. The Porter Honey-house mounted on a board makes the best kind of escape. Don't wait till to-morrow before you get a supply. You can not afford to be without them longer.

PRICES

Each, 25c; dozen, \$2.75; postpaid.

TESTIMONIALS

The Porter bee-escape clears the supers of bees so perfectly and quickly and easily that it makes the taking off of honey a pleasure instead of a dread as in former years.—G. M. Doolittle, Borodino, N. Y.

The removal of full honey-boxes has become an amusement since we began using the Porter bee-escape.—Ed. Bertrand, Editor Revue Internationale d'Apiculture, Nyon, Switzerland.

This number of the Review contains more unqualified praise of the Porter bee-escape than any other issue has ever contained of any other implement; but so long as it is deserved, who cares?—Bee-keepers' Review.

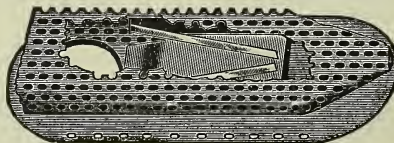
They are the greatest thing on earth for expelling bees from supers.—G. J. Flansburg, South Bethlehem, N. Y.

I would not be without them for four times what they cost.—Dr. W. A. Tufts, Musson, La.

Undoubtedly the best bee-escape is the one invented by R. & E. C. Porter.—W. S. Pouder, Indianapolis, Ind.

Bee-men are certainly behind the times if they can afford to use them and do not.—M. H. Mendelson, Ventura, Cal.

For Sale by Dealers Everywhere!



R. & E. C. Porter, Patentees

Send Orders to Your Dealer

ABC ^{AND} XYZ

of

Bee Culture

By A. I. and E. R. ROOT

New 1907 Edition

NOW ON SALE.

LARGER and BETTER

115,000 Copies have been
Printed

**A BEE-KEEPERS'
ENCYCLOPEDIA**

All the New Ideas

Hundreds of Illustrations to make
every thing plain and practical

Nearly 600 Large Pages

PRICES

Cloth-bound\$1.50
Half Leather..... 2.00
Full Leather..... 2.50
Postpaid to any Country in the World

THE A.I. ROOT CO.
MEDINA :: :: OHIO

Only two years have elapsed since we brought out an edition of 15,000 copies of the well-known A B C of Bee Culture. This brought up the number to 100,000 copies, thereby surpassing in popularity all other bee-books ever printed.

The demand for these has been so great that we were compelled to undertake a new edition at once, and in doing so we took the opportunity to revise and greatly enlarge it again, though it had been generally considered quite a large book.

In doing so we brought in new blood to assist us, give new ideas, and otherwise enable us to produce as good a book as it is possible to make at a popular price. If you will carefully examine a copy you will be prepared to admit the new volume is quite an improvement on its predecessors. To keep pace with improvements it contains nearly 100 double-column pages more than the previous edition.

The new methods of queen-rearing have been carefully reviewed, and the main points incorporated in the new edition, so that the practical bee-keeper who possesses a copy will have the best ideas of the subject constantly by his side for reference.

The new methods of wax-production are treated in an exhaustive fashion; and as this subject is now of more importance than formerly, more space has been devoted to it.

The new power-driven automatic extractors are amply illustrated and described. The subject of diseases has received entirely new treatment to keep pace with the new discoveries of the last few years. The laws relating to bees have for the first time received full treatment. No other bee-book treats of this very important subject. Honey, sugar, nectar, and glucose are carefully defined in accordance with the demands of our new pure-food laws.

In accordance with the ideas of its first author, A. I. Root, the new A B C and X Y Z is *eminently practical*.

German edition (new), paper covers, \$2 00; cloth-bound, \$2.50. Postpaid anywhere. This is the famous A B C in the language of the Fatherland, to suit our many German friends.

French edition (new), cloth-bound, \$2.00, postpaid. This is another edition, translated into the beautiful language of France.

Classified Advertisements.

Notices will be inserted in these classified columns at 20 cents per line. Advertisements intended for this department should not exceed five lines, and you must say you want your advertisement in the classified columns or we will not be responsible for errors.

Wanted, Situations.

WANTED.—Position by young man to assist in apiaary; would prefer the West. B. W. WELTMES, West Salem, O.

WANTED.—Position in apiaary; 15 years' experience; up to date, and understands queen-rearing; would like position to work into partnership. State wages, etc. BEEKEEPER, care of Osborne, 1156 Clement St., San Francisco, Cal.

Help Wanted.

WANTED.—An active young man or boy of good habits to work among bees or on farm; must be a good milkier. P. H. ELWOOD, Rt. 3, Fort Plain, N. Y.

WANTED.—Middle-aged bee-keeper to work on salary, or part salary and percentage of honey crop. Address with references. DR. GEO. D. MITCHELL & Co., Ogden, Utah.

WANTED.—A man to make garden, milk two or three cows, look after a few bees and chickens. Must be sober. On the Milwaukee R. R., \$40.00 per month to right man. DAN SLAYTON, Lavana, Mont.

Post Cards.

Send us your picture and 15 cts. and we will copy it on 12 post-cards and return same by mail postpaid. If satisfied on receipt of cards, send us 50 cts.; if not, return the cards by registered mail. One 8x10 and one 5x7 anastigmatic lens for sale. ACME POST CARD Co., Medina, Ohio.

Your photo copied on one dozen postal cards, and photo returned uninjured, with cards 50 cts. Finest black and white; no crasy red or brown finish; guaranteed permanent. Fancy etching of your name on each, 10 cents extra. Groups will be copied at same rate—2½ dozen, \$1.00. SANDUSKY ART STUDIO, Sandusky, W. Va.

Real Estate for Bee-keepers.

FOR SALE.—454 acres of land in Southern California; two sets of buildings, 117 colonies of bees, \$10 per acre. Plenty of water. Address Box 64, Fallbrook, Cal.

FOR SALE OR RENT.—On easy terms, a nice little poultry-farm of 7 acres, with poultry-houses to accommodate 200 to 300 fowls; a five-room house, barn, and other out-buildings, with a carpet-weaving shop 16x20, and a fly-shuttle loom in good order and plenty of work; also 10 or 12 colonies bees with good extractor and other fixtures. Good chance to make money, for the right party who can handle it all successfully. C. P. IMHOFF, Rt. 1, West Salem, O.

For Sale.

FOR SALE.—43 pairs homing pigeons, young breeders. GEO. STAFFORD, Rt. 4, Middleville, Mich.

FOR SALE.—Opaline honey-jars, all kinds; send for price list. HAROLD E. SHORE, Germantown, Pa.

FOR SALE.—Strawberry-plants. Send for catalog. BUSKIRK BROTHERS' NURSERY, Independence, Ohio.

FOR SALE.—Homestead farm crops in their season, consisting of honey, grapes, pears, apples, etc. C. J. BALDRIDGE, Kendala, Seneca County, N. Y.

FOR SALE.—500 second-hand 8-frame L. and Heddon hives in good condition, at 40 cts. each. f. o. b. Sandusky, Mich. H. & W. J. MANLEY, Sandusky, Mich.

SPECIAL SALE.—1½ story 8-frame dovetailed hives (no sections or starters) \$1.27 each. No. 1 beeway sections, \$4.00 per M. J. F. BUCHMAYER, Iowa City, Iowa.

FOR SALE OR EXCHANGE.—One 260-egg Excelesior incubator, 200 eight-frame hives; supers, and other supplies; also apple-trees of best varieties, 5 to 8 feet. F. H. MCFARLAND, Hyde Park, Vt.

FOR SALE.—Alsike clover-seed, \$10.00 per bushel; sacks included with one bushel or more. G. A. BLEECKT, Jerome, Mich.

FOR SALE.—Cyphers 220-egg and Iowa 120-egg incubators, good as new, cheap. C. H. ZURBURG, Rt. 1, Topeka, Ills.

FOR SALE.—One new Root queen-rearing outfit with instruction-book and foundation-fastener, only \$3.50. HARRY C. KLAFFENBACH, Muscatine, Iowa.

FOR SALE.—An apiaary and all appliances giving an average profit of one thousand dollars a year. For full particulars write immediately to ARTHUR LAING, Acton, Ontario, Canada.

FOR SALE.—Special sale of half a million of best Wisconsin sections; thousands of shipping-cases; big discounts on all supplies till February 1. Seeds of honey-plants. Write at once. H. S. DUBY, St. Anne, Ill.

FOR SALE.—Honey-cans used but once, emptied without steam or water, bright and clean; 100 cases or more, per case two cans, 25c; 50 cases, 30c; 25 cases, 32c; less, 35c. E. R. PAHL & Co., Milwaukee, Wis.

FOR SALE.—Pure maple syrup. A few orders will be taken at \$1.00 per one-gallon can; half-gallon cans, \$6.50 per dozen; one-quart cans, \$3.50 per dozen. Guaranteed first class. E. L. MINER, Williamsfield, Ohio.

FOR SALE.—Comb foundation, both brood and surplus, at a discount. Beeswax worked into foundation at a very low price. Send for price list and free samples to THE DELTA APIARIES, Delta, Colo.

FOR SALE.—If you want an illustrated and descriptive catalog of bee-keepers' supplies for 1907 send your name and address to FRANK S. STEPHENS, (Root's Goods.) Paden City, W. Va.

FOR SALE.—4x5 Premo "Film Plate" camera, 3 plate-holders, film-pack adapter, tripod, Todd's 1st and 2d Steps in Photography. Good condition; cost \$30.00; \$20.00 takes the outfit. E. F. ATWATER, Box 37, Meridian, Idaho.

FOR SALE.—Columbia disc graphophone and 82 records. Excellent condition, \$36. Cost \$80. Also Eastman kodak; cost \$9. Will sell for \$5, or exchange for honey-extractor. E. J. ADKISSON, R. 13, Nashville, Tenn.

FOR SALE.—Best Wisconsin sections, per 1000, \$4.00; 2000, \$7.75; 3000, \$11.10; No. 2, 50 cts. less. Discount on Root's and Danz. hives and other supplies. Fifteen eggs, B. P. Rocks and Wyandotte, \$1.00; Pekin ducks, 11 eggs, \$1.50. H. S. DUBY, St. Anne, Ill.

FOR SALE.—24 ten-frame St. Joe hives; 24 full-depth extracting-supers; 24 comb-honey supers; 470 combs, L. fr. ⅞ wired and built from full sheets of foundation (combs and supers fit above hives); 16 lbs. medium brood foundation, \$95.00 f. o. b. A bargain. H. A. BUSHBY, Rydal, Kan.

FOR SALE.—A fine lot of magnolia-trees. These are beautiful evergreens, and excellent honey-plants. Sometimes we get a 60-days' honey-flow from our trees. There is nothing more beautiful than a magnolia. Trees, 20 cts.; three for 50 cts., postpaid. R. H. MANLY, Riverton, La.

FOR SALE.—*Dried Fruit*, California to consumer, direct from where produced; wholesale prices; finest quality, fresh packed. Write for prices.

CALIFORNIA PRODUCTS CO., DEPT. 27, Colton, Cal.

FOR SALE.—A perfectly equipped apiary in foothills, 30 miles from coast; 150 colonies; excellent location for honey; 160 acres of land—40 tillable, the rest good grazing; fine springs; perfect locality for the health-seeker. Price \$1700. Address

J. D. BENNETT, 629 Clay Ave., San Diego, Cal.

Poultry Offers.

FOR SALE.—40 B. P. R. pullets cheap to make room. Eggs in season. MRS. W. L. BENNETT, Misc. O.

WHITE ROX.—"Fishel's" stock and eggs. Write your wants. DR. C. L. VAN OSDOL, Dillsboro, Ind.

FOR SALE.—White Wyandottes, 15 eggs, 75 cts.; 30, \$1.25. Uncle Sam potato, very productive; 1 pound by mail, 30 cts. J. F. MICHAEL, Winchester, Ind.

FOR SALE.—White Wyandottes. Egg-record strain; standard-bred, farm-raised, unlimited range; healthy, vigorous, prepotent. Eggs, \$1.50 per 15.

F. H. TRENT, Hollybrook Farm, Rockford, Tenn.

Bees and Queens.

FOR SALE.—All who intend to buy bees, queens, and hives, should write postal for Charles W. Zwoily's 1908 catalog. CHARLES W. ZWOILY, Fremont, Ohio.

FOR SALE.—400 colonies Italian bees in 8 or 10 frame Dovetailed hives with Hoffman frames, at \$6.00 per colony. In lots of 10, \$5.00 per colony.

F. A. GRAY, Redwood Falls, Minn.

FOR SALE.—A full line of bee-keepers' supplies; also Italian bees and honey a specialty. Write for catalog and particulars. Choice mellilotus (white sweet clover) seed for sale at eight cents per pound.

W. P. SMITH, Penn. Miss.

EARLY ORDERS booked now for delivery after May 1st. Best Italian bees, \$6.00 per colony. Two-frame nucleus, \$2.00. Queens, tested, \$1.00; doz., \$11.00. Untested, 75 cts.; doz., \$8.50. Virgins, 40 cts.; doz., \$4.50. Cash orders filled first.

GEO. H. REA, Reynoldsville, Pa. Rt. 2.

Wants and Exchange.

WANTED.—75 colonies of bees; prefer in 10-frame L. hives, easy shipping distance of Chicago.

R. B. HOLBROOK, 226 S. Howard Ave., Austin, Ill.

WANTED.—Refuse from the wax-extractor, or slumgum. State quantity and price.

OREL L. HERSHISER,
301 Huntington Ave., Buffalo, N. Y.

WANTED.—Names of parties having bees to sell in South. Give price. Would like to correspond with bee-keepers on or near the Ohio, Cumberland, and Tennessee rivers.

W. W. CRIM, Pekin, Ind.

WANTED.—The address of some person who would let his bees on shares. California preferred. State number of colonies and condition.

PERRIN, 417 S. Flower, Los Angeles, Cal.

Honey and Wax Wanted.

WANTED.—White ripe extracted honey; will pay cash. GEO. RAUCH, No. 5343 Hudson Boulevard, North Bergen, N. J.

WANTED.—Comb, extracted honey, and beeswax. State price, kind, and quantity.

R. A. BURNETT, 199 S. Water St., Chicago, Ill.

WANTED.—To buy basswood, clover, and amber extracted honey for cash. Best prices paid. Send sample, and quote price delivered in Preston.

M. V. FACEY, Preston, Fillmore Co., Minn.

WANTED.—No. 1 and fancy comb honey; 4x5x1½ section preferred. Also light extracted. Must be guaranteed pure. Write, stating grade and how put up, and lowest cash price.

C. M. CHURCH, Arnold, Pa.

Honey and Wax For Sale.

FOR SALE.—1500 lbs. beeswax.

DR. GEO. D. MITCHELL & Co., Ogden, Utah.

FOR SALE.—2000 lbs. honey at 10 cents per lb. f. o. b. anywhere. B. F. AYERILL, Howardsville, Va.

FOR SALE.—36 cases of comb honey in 4¼ and 4x5 plain sections. Clover and raspberry.

E. D. TOWNSEND, Remus, Mich.

FOR SALE.—White-sage honey, case, 125 lbs. net, 9 cts. per lb.; 3 cases at 8¼. Light amber, 7 to 8¼.

I. J. STRINGHAM, 105 Park Place, New York City.

FOR SALE.—4000 lbs. choice white honey in 60-lb. cans—just the thing for bottling purposes; 9½ cts. in small lots, or 9 for the lot. H. B. PHILLIPS, Auburn, Me.

FOR SALE.—Alfalfa extracted honey in 60-lb. cans, 8 cts. per lb., f. o. b. Kansas City; sample sent upon request. One thousand pounds of beeswax for sale at 27 cts. per lb. C. C. CLEMONS & Co., Kansas City, Mo.

FOR SALE.—Buckwheat and amber comb honey, \$3 per case; 12 cases, \$2.85; 25 cases at \$2.70 per case; 24 sections to case; dark amber extracted at 7¼ cts. per pound in 60-lb. cans.

QUIRIN-THE-QUEEN-BREEDER, Bellevue, O.

FOR SALE.—Fancy white comb honey; also extracted basswood, white clover, alfalfa, and amber honey in barrels or 60-lb. cans.

ROBT. A. HOLEKAMP & SON,
4263 Virginia Avenue, St. Louis, Mo.

Bee-keepers' Directory.

SWARTHMORE Golden-all-over, Caucasian, Banat, Carniolan, Cyprian queens. E. L. Pratt, Swarthmore, Pa. *Queen-rearing outfits and books; new catalog free.*

QUEENS.—Clover stock. Experience and methods count. Write me. H. G. LARUE, LaRue, Ohio.

ITALIAN queens bred for honey, untested, 75c each. GEO. H. PLACE, 816 No. 49th St., Omaha, Neb.

Extra honey queens and choice mountain honey. Francis J. Colahan, Bernardo, San Diego Co., Cal.

QUEENS.—Pure Gold, Red-clover, Caucasian, Banat, ROSE LAWN APARIES, College View, Lincoln, Neb.

ITALIAN QUEENS.—Golden and red clover. Send for 1908 circular. G. W. BARNES, Box 340, Norwalk, O.

Bee-keepers' supplies, Italian queens. Send for a free catalog. ARTHUR RATRAY, Almont, Mich.

ITALIANS, CARNIOLANS. No disease. Two-comb nucleus with queen, \$3.00. A. L. AMOS, Comstock, Neb.

ITALIAN BEES and queens—Red-clover strain imp'd mothers. A. W. YATES, 3 Chapman St., Hartford, Ct.

ITALIAN BEES, queens, and Root's bee supplies. E. SCOGGIN, Carlsbad, N. M.

I club a high-grade Italian queen with GLEANINGS, new or renewal. W. T. CRAWFORD, Hinston, La.

Three-band and golden Italian; untested, 75 cts.; per doz., \$7.00. E. A. SIMMONS, Greenville, Ala.

ITALIAN BEES and queens—red-clover and golden strains. E. A. SIMMONS, Greenville, Ala.

Well-bred bees and queens. Hives and supplies. J. H. M. COOK, 70 Cortlandt St., New York City.

ITALIAN bees and queens bred for honey; price list free. B. F. YANCEY & SON, Angleton, Tex.

For bee-smoker and honey-knife circular send card to T. F. BINGHAM, Farwell, Mich.

FOR SALE.—Golden and red-clover Italian queens. WM. A. SHUFF, 4426 Osage Ave., Philadelphia, Pa.

ITALIAN QUEENS by return mail or money refunded. Circular free. D. J. BLOCHER, Pearl City, Ill.

GOLDEN yellow Italian queens—my specialty. Price list free. E. E. LAWRENCE, Doniphan, Mo.

ROOT'S BEE SUPPLIES. Send for catalog. D. COOLEY, Kendall, Mich.

FOR SALE.—Root's bee-supplies, wholesale and retail; factory prices; catalog free. Beeswax wanted. W. E. TRIBBETT, Staunton, Va.

Root's bee-supplies at factory prices, *Black Diamond Brand Honey*, and *bee-literature*. Catalog and circulars free. GEO. S. GRAFFAM & BRO., Bangor, Maine.

QUEENS.—Improved red-clover Italians, bred for business, June 1 to Nov. 15, untested queens, 60 cts.; select, 75 cts.; tested, \$1.00 each. Safe arrival and satisfaction guaranteed. H. C. CLEMONS, Boyd, Ky.

ANGEL is breeding his Golden beauties and bright three-banded Italian queens, but will not offer any for sale this season, on account of not being at home at all times of the season. SAMUEL M. ANGEL, Evansville, Ind.

IMPROVED ITALIAN bees and queens ready in May. Circular and testimonials free; second-hand surplus arrangements for 4/4 sections, also folding cartons, cheap if taken soon, or will exchange. QUIRIN-THE-QUEEN-BREEDER, Bellevue, O.

TENNESSEE QUEENS.—Best that experience can produce. Untested three-band and goldens, \$1.00 each; 6 for \$5.00; 12 for \$9.00. Caucasians and Carniolans, \$1.25 each. Write for circular, order goldens from Ben G. Davis; others from John M. Davis, Spring Hill, Tenn.



DO YOU
WANT A
LARGER
INCOME

Investigate our adjustable concrete-molds. These are suitable for a large variety of work, such as burial-vaults, watering-troughs, and many other things needed in town and country.

INDIANAPOLIS CONCRETE BURIAL VAULT CO.,
442 Board of Trade Bldg., Indianapolis, Ind.

CUTS USED IN THIS MAGAZINE
ARE FROM
THE MUGLER ENGRAVING CO.
MUGLER BLDG. CLEVELAND, OHIO.



We have just received notice of the death of Mr. Henry Alley, the veteran queen-breeder of Wenham, Mass. Our sincere condolence is extended to his sorrowing family.

GREEN'S SEEDS.

This is the title of a new catalog which we have just printed for E. C. Green & Son, of Medina O., who succeeded to the garden-seed department of The A. I. Root Co. several years ago. They would be pleased to mail this catalog to any reader of this journal who will send a request for it. These enterprising seedsmen have originated a new tomato of such value that one of the big seed-houses of Philadelphia sent their tomato expert to Medina to examine it, and was so well pleased that he paid a big price for all the seed they had to spare. If in need of garden seeds, send to E. C. Green & Son, and, as a favor to us, mention that you saw it in this journal.

CLOVER SEEDS.

There has been a sharp advance in clover seed, so that the best price at which we can offer Medium Mammoth or alsike seed, choice, is \$12.00 per bushel; half bushel, \$6.25; peck, \$3.25; per lb., 23 cts.; by mail, 32 cts. per lb. Alfalfa seed will have to go at the same price. Medium grades of seed may be furnished a little cheaper. Write for sample and price if interested. Strange as it may seem, white-clover seed is now cheaper than other kinds, and can still be furnished at \$10.00 per bushel; \$5.25 per half bushel; \$2.75 per peck; 20 cts. per lb. Crimson or scarlet clover will be furnished at \$8.75 per bag of two bushels; \$4.50 per bushel; half bushel, \$2.40; peck, \$1.25; 1 lb., 10 cts.; by mail, 20 cts. Hulled white-sweet-clover seed at \$11.00 per 100 lbs.; \$3.00 for 25 lbs.; \$1.30 for 10 lbs.; 15 cts. per lb.; by mail, 25 cts. Hulled seed, when we have it, 7 cts. per lb. extra.

THE ALEXANDER BEE-VEIL.

We have secured, for making a bee-veil of wire cloth, a special weave of cloth having 8 meshes to the inch, and No. 32 wire painted black. Ordinary window-screen cloth is of the same size of wire, and 12 to 14 meshes to the inch. This special cloth is, therefore, more transparent, and obstructs the vision less, than any other cloth we were ever able to secure. One objection to a veil of this kind is its bulk and the difficulty of transporting it, either by mail or when packed with other goods. We have overcome this one objection by



making it with an open seam from the crown to the bottom of the skirt. Eight small safety-pins are included to pin up this seam when you receive it, or you may prefer to sew it up. The veil is rolled up so as to be placed in a box 3 x 3 x 12 inches so that it can be mailed safely for 12 cents postage, or packed with other goods to go by freight. Price, complete, 60 cts. By mail, 72 cts. Special wire cloth for veil, furnished at 6 cts. per foot or piece for a veil at 45 cts.; by mail, 2 cts. a foot extra, or 20 cts. postpaid for a veil-piece 10 x 33 inches, having edges folded ready to sew on the cloth parts.

COLD-FRAME OR HOT-BED SASH.

We are receiving some nice orders for these sash, and we believe that, if more of the truck-gardeners understood how good they are, and the low price at which they may be had, we should be swamped with orders. We have not seen as low prices quoted by anybody else, not even the cut-rate mail-order houses, as we are making on these. Some of our readers may

know of greenhouse-men in their neighborhood who do not take this journal, and may do them a favor by calling their attention to our prices. Cypress hot-bed sash, 3½ feet by 6 feet, for four rows of eight-inch glass, with hard-wood round rod crosswise through the bars midway between the ends to help space the bars and hold them secure. shipped K. D., 90 cts. each; 5 for \$4.25; 10 for \$8.00. Put together, 10 cts. each more, not painted. If painted, add 10 cts. for each coat of paint. If glazed with 8 x 10 glass, add \$1.00 per sash; 8 x 10 glass, \$2.40 per box; 5 boxes at \$2.30, or 10 boxes at \$2.20.

SECOND-HAND FOUNDATION-MILLS.

We have to offer the following second-hand foundation-mills in good condition. We shall be pleased to hear from any one interested. To such we can send a small sample of comb foundation representing the kind of work produced by the particular machine you enquire about.

No. 079.—6x2½-inch hex. cell thin-super mill, in very good condition. Price \$12.00.

No. 008.—6x2½-inch hex. cell thin-super mill, in good condition. Price \$12.00.

No. 088.—6x2½-inch hex. cell extra-thin-super mill, in good condition. Price \$12.00.

No. 088.—12x2½-inch round-cell heavy-brood mill, in fair condition. Price \$12.00.

No. 077.—10x2 inch-medium brood round cell, old-style frame, in good condition. Price \$14.00.

No. 092.—6x2½-inch hex. cell extra-thin-super mill, in fine condition. Price \$15.00.

No. 2275.—6x2½-inch hex. cell extra-thin-super mill, in good condition. Price \$13.00.

NEW TAPER-PANEL HONEY-JARS.



We show here an illustration of a new style of honey-jar holding half a pound. It is a taper-panel jar with lacquered tin cap lined with waxed paper wad which turns on tight with a one-fourth turn, warranted to hold airtight. We expect to have ready soon the one-pound size of the same style jar. Packed in reshipping-cases of two dozen each, ready to ship again, when filled, without additional packing.

Price ½-lb. taper-panel jar, 80 cts. per case; 6 cases, \$4.50.

Price 1-lb. taper-panel jar, \$1.00 per case; 6 cases, \$5.70.

Put up in crates of 2 gross, ½-lb. size, \$3.75 per gross. Put up in crates of 1 gross, 1-lb. size \$4.80 per gross.

SIMPLEX HONEY-JARS.



The factory have assured us that we may again secure this popular honey-jar in several sizes, including the one holding one pound of honey. We have ordered a fresh supply, but do not expect to have them in stock till next month. They will be packed in reshipping-cases of two dozen each, and the price will be \$1.10 per case; 6 cases, \$6.30.

NO. 25 HONEY-JARS.

During the past year we have had an unusual amount of trouble with breakage of this jar, even in the reshipping-cases packed with corrugated paper. The breakage occurred either in the porcelain cap or the top rim of the jar where the cap rests. We find we can get this same jar with lacquered tin cap without the center being cut out. This cap is lined with waxed paper wad, which seals tight on the top edge of the jar. This style of cap not only does away with breakage almost entirely, but enables us to furnish the jar at a lower price. We are not yet supplied with the new stock, but expect to have them next month at the following price. They will be packed as usual, two dozen in reshipping partitioned cases. No. 25 jars, tin cap lined, 90 cts. per case; 6 cases, \$5.10. We can still furnish from stock the usual style of No. 25 with porcelain caps at \$1.10 per case; 6 cases, \$6.30.

A NEW SIZE OF SECTION.

There seems to be a demand in some localities, where bees are inclined to daub with propolis or oth-

erwise discolor the wood in sections for a wide frame completely enclosing the sections. Our regular supers are adapted to the regular sections in section-holders without a top-bar. To provide a top-bar as well as a bottom it is necessary either to make the super deeper or the section shorter. In order to use the regular deep super we have decided to make a new section, 4¼x4¼x1½ or 1½ plain, no beeway. This will be used in a section frame hanging by top-bar in the regular deep super, interchangeable with the shallow Hoffman frame 5½ deep. This will necessitate a new fence adapted to this size of section, which will be designated by the letter N. The 4¼x4¼x1½ will hold a full pound, and will work best in the eight-frame super, 24 to the super. In the Danz. width (16¼) ten-frame super the 4¼x4¼x1½ will fit best 32 to the super. These sections may be splitter inserting foundation by the Hand method, and the correct size of sheets for that purpose would be 4½x17½. Price of N section-frames, \$2.50 per 100 in flat. Price of N fences, \$2.00 per 100. Sections 4¼x4¼x1½ or 1½, same price as regular Danz., \$4.75 per 1000, No. 1; \$4.25 for No. 2. Unless you specify we will send frames and sections 1½ wide, and supers fitted with the same. Deep super fitted with N section-frames, N fences and springs, either 8 or 10 frame, will be designated 2 N 8. Price, nailed and painted, 70 cts. each; in flat, 55 cts.; 5 for \$2.50.

2 N 10. Price, nailed and painted, 75 cts. each; in flat, 60 cts.; 5 for \$2.75.

With sections and foundation-starters included. 4 N 8. Price, each, nailed and painted, \$1.00; in flat, 75 cts. each, 5 for \$3.50.

4 N 10. Price, each, nailed and painted, \$1.05; in flat, 80 cts. each; 5 for \$3.75.

With sections and full sheets of foundation. 1 N 8. Price, each, nailed and painted, \$1.40; in flat, \$1.00 each; 5 for \$4.50.

1 N 10. Price, each, nailed and painted, \$1.45; in flat, \$1.05 each; 5 for \$4.75.

These are not listed in our catalog this season, and not in stock with any of our dealers. If you wish to test them you will have to make special orders to secure them. You can get them through your dealer if you order in ample time and are not in a hurry to receive them. This section will require a new size of carton and a new size of shipping-case to put them up for market. We offer the new size for experiment this season to see if it has sufficient warrant for introduction into the catalog another year. By cutting beeways in the top and bottom they could be stored without fences or separators, and four could be placed in a shallow Hoffman frame for storing, though they would not be as well protected as in a section-frame. The latest style of shallow frame with ¾-inch ends would be rather scant in length inside to take four sections, but those made earlier would have room.

Convention Notices.

The Northern California Bee-keepers' Association, F. J. Lewis, Pres., will hold its fourth semi-annual convention at Pioneer Hall, Seventh St., between J and K, Sacramento, Feb. 19 and 20. Morning session at ten; afternoon, 1; evening, 8. The objects of this association are to promote and protect the interests of its members. Headquarters at the Western Hotel. All bee-keepers are requested to attend.

B. B. HOGABOOM, Secretary-Manager.

SHORT COURSE IN BEE-KEEPING.

The University of Tennessee will give a short lecture course in bee-keeping extending from February 27 to March 11, inclusive. The tuition is free. The whole State of Tennessee is suited to bee-keeping and this short course ought, and deserves to be well patronized. There are other short courses on different subjects which are well worth while attending by young men and women of the State.

		1	6	12
Abbsbaz	{ Tested queen.....	\$1.45	\$7.00	\$13.00
	{ Select tested.....	2.00	11.00	20.00
	{ Select breeding.....	3.00	17.00	32.00
Caucasian	{ Extra select breeding..	7.00		
	{ Tested.....	2.00	11.00	20.00
Banats	{ Select tested.....	2.50	14.50	25.00
	{ Select tested breeding..	5.00		

Safe delivery and genuineness of breed guaranteed. Write orders distinctly, especially the address, and indicate by letter the queen ordered.

. Ivanhoff, Georgievsk, Province Terskaya, Russia (Caucasia).

Mr. Bee-keeper,

Was 1907 a POOR YEAR for you?

It was a GOOD YEAR for users of

DADANT'S FOUNDATION.

One dealer used 14,000 pounds.

Another dealer used 7,250 pounds. Another dealer used 4,500 pounds. Another dealer used 4,500 pounds.
Another dealer used 6,000 pounds. Another dealer used 4,500 pounds. Another dealer used 3,000 pounds.

Thousands of pounds sold to the bee-keeper direct, or worked up for him out of his beeswax.

The DEALER likes DADANT'S FOUNDATION because the bee-keeper likes it.

The bee-keeper likes it because his BEES like it.

The BEES like it because it is exactly like their own comb, so PURE and SWEET and CLEAN.

DADANT'S FOUNDATION is the Standard because it is the BEST.

Wax worked into foundation.

Send for our Supply Catalog.

DADANT & SONS, HAMILTON, ILL.

SUPPLIES FOR BEE=KEEPERS

Every thing you want; all made by us
in our own factories--at
LOWEST PRICES.

The American Bee-keeper (published 17 years), a monthly at 50 cts.
a year. Sample copy and illustrated catalog and price list free. Address

W. T. FALCONER MFG. CO.

DEPARTMENT G, :: :: :: :: :: :: :: ::

JAMESTOWN, N. Y.

"If You Want a Good Recommend

for Your Buggy, Ask My Wife for It."



That's the way one of our customers wrote us recently. He also said,

"I want to tell you how well pleased I am with my Sheltertop Cab. It is far better than you represented it to be. I would not sell it for twice what it cost me if I could not replace it. It is the only buggy I ever had that I could take my wife riding in on a windy day, and enjoy myself. PERCY STITES, Wauseon, O."

The Sheltertop Buggy can be changed from the wide open form shown above to the tightly closed form shown below, in four seconds, without leaving the seat, dropping the lines, or stopping the horse. When closed it is absolutely storm-proof; wind, rain, mud, dust, snow, or sleet can not enter at any point; but your view in any direction remains unobstructed. There are no swinging or sliding doors on the Sheltertop Cab—no storm-apron, side curtains, no detachable parts of any kind; nothing to be lost, loaned, stolen, or forgotten.

The Sheltertop Buggy is built of the best material money can buy—built to wear well on rough roads—built to run light and run right through mud and sand and over rocks and ruts. It is not the cheapest buggy on the market so far as first cost is concerned, but it is the cheapest buggy in the world "in the long run."

WHAT THE USERS SAY ABOUT IT :

I have used my buggy in all kinds of weather, over all grades of roads, and am well satisfied with it as a storm-proof buggy and with the material and workmanship. I like it because it protects me from winter weather and mud; because it is easy to get into and out of; because it is roomy, comfortable, and safe; and because it is a high-class buggy in every way.
E. A. SILVER, Sullivan, Ill.

The Sheltertop buggy came all right, and is properly named, as I consider it the best storm carriage I ever saw. It is light, and the only true storm carriage made anywhere.
F. H. CAMPBELL, Philadelphia.

The Sheltertop buggy reached me in perfect condition. For stormy or good weather I think it unequalled. It is a fine-running buggy, not heavy, and is much admired by all who see it.
LOUIS F. GRANDY, Chili Center, N. Y.

We will ship the Sheltertop buggy to any point in the United States on 30 days' "suspicion."

Write for our free catalog. It explains all about the Sheltertop buggy; illustrates and describes in detail fifteen different styles; tells you all about the material and workmanship, trimming, painting, etc.
Write for it to-day.



FOUTS & HUNTER CO.

333 S. THIRD ST.

TERRE HAUTE, IND.

DEEN LOOM



Flying Shuttle

WHY not put your spare moments to work bringing in extra cash? Some people in your town are waiting for some one to make up their rags into carpets, rugs and portieres.

It's genteel, honest work that any man or woman can do and make good profit at it. Just to prove it, here are the names and addresses of fifteen out of hundreds of people who have woven carpets and rugs at a good profit. They use a Deen Loom.

Good Profits Made At Home

- Mrs. C. R. Stover, Bradford, Ohio
- Oma Cooper, Dale, Indiana
- R. P. McGowan, Piedmont, W. Va.
- Mrs. Rob. Record, Seymour, Illinois
- Mrs. Henry Clark, St. Anthony, Iowa
- Mrs. A. L. Clark, Central Square, N. Y.
- Mrs. H. C. Blannah, New Lathrop, Mich.
- Mrs. T. E. Alley, Sylvan Grove, Kansas
- Mrs. O. E. Albin, Kearney, Nebraska
- Mrs. H. Goebel, West Point, Iowa
- Mrs. J. S. Gilbert, Milton Junction, Wis.
- Mrs. L. E. Foster, Bedford, Indiana
- Mrs. Salanda Gunckel, Osgood, Ohio
- Mrs. D. E. Williams, Pickering, Missouri
- M. H. Vining, Waterloo, Iowa

Remember these are only fifteen of scores and hundreds who at this moment are hustling out work and getting good money for it.

You Who Read This

Haven't you often wished for a useful employment by which to make money in your spare hours? No doubt you know of people who would gladly pay you for weaving their rags into carpets and rugs.

It's not only the poorer people that have hand-woven carpets and rugs on their floors, but well-to-do people of city, village and country-side appreciate the handsome and useful products of home-weavers.

By canvassing among your friends you can work up a good business. Profitable, too. Besides, it's done at home with the children, where you can have an eye on everything in house and yard.

It's Not Hard Work

Weaving with a Deen Loom is soon learned. The Loom itself is a simple affair, easily handled, and soon understood. May Vittum, Barclay, Kansas, says:

"I can weave almost twice as much as I could with the old loom. I would not go back to the old one for anything. The new one is faster, easier, and does the best work."

Having a steel frame well-braced, and rigid, it resists the shock and stroke of the shuttle mechanism, remaining solid for years without repairs.

It will accommodate any size rug or carpet demanded.

What May Be Woven

Any design can be made in any number of colors that taste and fancy may dictate. You can weave rugs, hammocks, all kinds of hand-weaves, carpets, portieres, etc. The materials to use are common carpet warp which can be purchased of any dry goods store; carpet rags, old clothes of any kind, old ingrain and brussels carpets, blankets, or nearly any kind of fabric. Your customers furnish you all material; you do the weaving and get good pay for it.

A Few Prominent Reasons for Buying

- 1.—You can make from \$2 to \$3 a day if you weave 8 hours daily.
- 2.—You can make from \$4 to \$10 a week using only part of your time—say evenings after work and an hour in the morning.
- 3.—We help you personally by letter if you wish. But this is seldom necessary, because we send you simple, detailed instructions with pictures of the loom and its parts. This book makes everything plain. You have no real difficulty in handling the loom.
- 4.—The Fly-Shuttle is easily filled, quick to handle, doesn't bother.
- 5.—The Winding Mechanism and Feed-Governor are new improvements. The latter keeps the warp and weft mechanism within control. It saves much material and prevents hours of thrown-away time used by old-style looms.
- 6.—It takes up much less room than many other styles. It requires a room but 10 feet square for a complete weaving shop.
- 7.—We send you everything with the Loom. You can go right to weaving as soon as you get warp and rags.

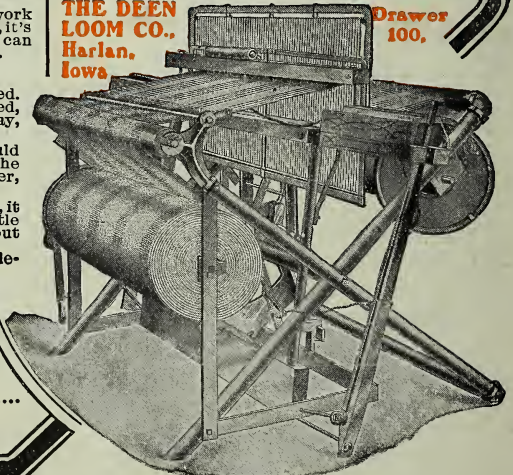
You Needn't Pay All At Once

Pay something down. As Loom brings in profits send balance by easy installments.

Fill in the coupon and mail. We'll send our free catalog and a letter about our easy-pay plan.

**THE DEEN
LOOM CO.,
Harlan,
Iowa**

**Drawer
100.**



COUPON

Deen Loom Co.— Date.....19....

Please send me your free catalog and detailed explanation of your "Easy Pay Plan" of selling your Deen Loom.

Name.....

Address.....

Town.....State.....

