

Excerpt from *Sacred and Healing Herbal Beers* by Steven Harrod Buhner
Starting on page 20.

ABOUT HONEY, BEE POLLEN, PROPOLIS, ROYAL JELLY, AND BEE VENOM.

[Eat thee of honey] wherein is healing for mankind.—the Koran

Among the Finns . . . there existed the belief that high in the sky was the storehouse of the Almighty, containing the heavenly honey, which had the power to heal all wounds.

—Robert Gayre, 1948²⁵

Many health-enhancing attributes have long been associated with mead. As the historian of mead, Robert Gayre observes, “From the earliest times men have recognized that honey, and particularly mead, have strong revitalizing qualities, as well as healing virtues. As a consequence of this it was believed to be an elixir to prolong life, and this, no doubt, is why the magic mead of heaven was believed to confer immortality upon the mortals who partook of it.”²⁶ Regular consumption of mead, it was claimed, would restore youthfulness, increase sexual drive, prevent illness, and cure diseases such as arthritis, stomach ulceration, bronchitis, impotency, general weakness and debility, heart disease, and cancer, as well as many others.

Modern writers have generally assumed that these claims are merely fantasy. However, all fermentations, whether beer, ale, mead, or wine, possess the medicinal actions of whatever ingredients they contain or are made from. If the medicinal effects of the ingredients of mead are examined, it is interesting to note that they are identical with many of the ancient claims made about mead. In spite of modern dismissals of the healthy effects of drinking mead, no studies have ever been conducted to see if any of these ancient claims have any foundation in fact. It is important to remember, however, that mead was originally made from the entire hive. That means that everything went into the pot: wax, honey, propolis, bee pollen, royal jelly, and angry bees. It makes sense, then, to look at the medicinal actions of these separate parts of the hive and see if their medicinal actions in any way match the claims made by our ancestors for mead. It could very well be that the medicinal effects of every ingredient in mead combine to produce the healthful effects long attributed to mead. That is, the actions and properties of honey, bee pollen, propolis, royal jelly, bee venom, yeast, and alcohol from the fermentation act together to create highly beneficial effects on human health.

HONEY

Honey is the nectar of the flowers of plants, gathered by the bee and stored in its stomach for transport to the hive. Nectar begins with glucose being produced by the plant. The plant makes glucose by combining carbon dioxide gas and water in its leaves through the use of chlorophyll and sunlight (photosynthesis). Then part of the glucose is converted into fructose, and all of it together is combined into sucrose. This is circulated throughout the plant to produce energy for growth. Some of this sucrose (along with other compounds) is diverted to the plants’ flowers to coax nectar gatherers into cross-pollinating them.

Ignoring the other plant compounds, nectar is primarily sucrose, a disaccharide—that is, it is a double-molecule sugar, made from one fructose molecule and one glucose molecule linked together. The bee’s stomach enzymes take the sucrose molecule and break it apart into glucose and fructose. Glucose is slightly less sweet than sucrose (white sugar), and fructose is sweeter. Because fructose is so much sweeter than glucose, it takes fewer calories of fructose to achieve the same level of sweetening produced by the other sugars. In the hive, the bee regurgitates the nectar into the wax cells of the comb (which brings up images of Odin and the Mead of Inspiration). The nectar is moved from cell to cell to facilitate drying. Eventually large numbers of bees band together, and by fanning their wings, perform the final evaporation to thicken the nectar into what we call honey, which is about 80 percent solids and 20 percent liquid.

Unlike sucrose, fructose and glucose in combination and at such a concentration are very stable. The fructose is the most stable, being nearly impossible to crystallize. When honey does crystallize, it is the glucose you see—the remaining liquid is fructose. Fructose helps keep the honey liquid for extended periods of time.

Ancient honeys were from a profusion of wildflowers, whatever grew locally. It was exceedingly uncommon for honey to be gathered from a single species of plant, such as the alfalfa or clover honeys of today, unless that plant species existed in great abundance (as heather does). As such, the honeys of antiquity generally possessed the essence of a multitude of wild plants—all of them medicinal. Honeybees find a great attraction to many strongly medicinal plants—vitex, jojoba, elder, toad-flax, balsam root, echinacea, valerian, dandelion, wild geranium—in fact, almost any flowering medicinal herb, as well as the more commonly known alfalfas and clovers. The nectar from a multitude of medicinal plants is present in any

wildflower honey mix. That some of the power of the plant from which it is collected remains in the honey can be seen from the fact that honeys made from poisonous plants will poison people who eat them. Charles Millsbaugh in 1892 commented that the honey of Trebisond, produced from the Persian *Rhododendron ponticum*, is poisonous, as is honey produced from *Azalea pontica*.

Ancient records have attributed at least one defeat of Roman soldiers to eating poisonous honey the night before a battle. Even today, bee-keepers are warned to avoid allowing their bees to collect nectar from plants known to produce poisonous honey. It is amazing that it has not been recognized that the concentrated nectar of medicinal plants also holds within it the concentrated medicinal power of the plants from which it is collected. But this concentration of medicinal essence explains, in part, the healing power long attributed to honey and mead. However, in addition to the plants' own medicinal qualities, the plant nectars are subtly altered, in ways that modern science has been unable to explain, by their brief transport in the bees' digestive system. Before regurgitation, the nectars combine in unique ways with the bees' digestive enzymes to produce new compounds.

Honey, often insisted to be just another simple carbohydrate (like white sugar), actually contains, among other things, "a complex collection of enzymes, plant pigments, organic acids, esters, antibiotic agents, and trace minerals."²⁷ Honey, in fact, contains more than 75 different compounds. Besides those already listed, it contains proteins, carbohydrates, hormones, and antimicrobial compounds. One pound of (nonheather) honey contains 1,333 calories (compared to white sugar at 1,748 calories), 1.4 grams of protein, 23 milligrams of calcium, 73 milligrams of phosphorus, 4.1 milligrams of iron, 1 milligram of niacin, and 16 milligrams of vitamin C.²⁸ The content of each of these substances varies considerably depending on which type of plants the honey is gathered from. Some honey may contain as much as 300 milligrams of vitamin C per 100 grams of honey.²⁹ It also contains vitamin A, beta-carotene, the complete complex of B vitamins, vitamin D, vitamin E, vitamin K, magnesium, sulphur, chlorine, potassium, iodine, sodium, copper, manganese, and a rich supply of live enzymes.³⁰ Honey also contains relatively high concentrations of hydrogen peroxide and formic acid,³¹ and many of the remaining substances in honey are so complex that they have yet to be identified.

Honey has been found to possess antibiotic, antiviral, anti-inflammatory, anticarcinogenic, expectorant, antiallergenic, laxative, antianemic, and tonic properties.³² It is also antifungal and an immune stimulant.³³ Because honey increases calcium absorption in the body, it is also recommended during menopause to help prevent osteoporosis.

It has been found to be highly effective for treatment of stomach ulceration; all seven strains of the *Helicobacter pylori* bacteria that cause stomach ulceration are completely inhibited with a 5 percent solution of honey.³⁴ In comparison tests, honey was found to be more effective than a number of other, more commonly used, antimicrobial agents in the treatment of *H. pylori* ulceration.³⁵

The British Journal of Plastic Surgery reported that clinical trials found honey to provide faster wound healing than traditional pharmaceuticals.³⁶ Other studies have found that recovery from Caesarean delivery and gangrene infection by honey-treated patients was far superior to patients treated with antibiotics and pharmaceutical wound dressings.³⁷ These studies have been echoed by a number of other researchers, all finding that honey's antibacterial action and wound-healing properties are exceptionally effective on all types of wounds.³⁸ A number of people have insisted that this antimicrobial activity comes from the high sugar concentration of honey—an activity also found in high concentrations of white sugar. However, even a diluted honey solution of .25 percent has been found to be highly antibacterial, inhibiting *Staphylococcus aureus* bacteria.³⁹ Numerous other studies have shown that, though the high sugar concentration is antimicrobial, honey itself possesses active compounds that are, in themselves, antibacterial.

Some of the wounds that clinicians have seen healed with honey are bed sores, varying in size from the width of a finger to a fist that extended to the bone. Such ulcerations, healed with the use of honey, left no indentation and no muscle loss.⁴⁰ Even wounds that were so infected they would not respond to any antibiotic therapy have responded to honey.⁴¹ Dilute honey solutions have been successfully used to preserve corneas, bones, and blood vessels intended for surgical transplantation.⁴² And Chinese researchers have found honey to be an effective treatment in first, second, and third-degree burns, preventing scarring, inhibiting infection, and in many instances alleviating the need for skin grafts.

Honey is also exceptionally effective in respiratory ailments. A Bulgarian study of 17,862 patients found that honey was effective in improving chronic bronchitis, asthmatic bronchitis, bronchial asthma, chronic and allergic rhinitis, and sinusitis.⁴³ It is effective in the treatment of colds, flu, and respiratory infections, and general depressed immune-system problems.⁴⁴

Generally, raw, unprocessed, and unpasteurized wildflower honey should be used in the production of mead and as food and

medicine. For wounds and burns it is generally placed, liberally, on the affected area and covered with a sterile bandage, the dressing changed daily. For infectious diseases, it is used liberally in food and as a supplement, either undiluted, in tea, or as mead—one tablespoon 8 to 12 times daily.

Honey as food is different from white sugar, though many dieticians will tell you otherwise. Honey is composed of (approximately) 38 to 40 percent fructose, 31 to 34 percent glucose, 1 to 2 percent sucrose, 17 to 20 percent water, 2 to 4 percent identified plant and mineral compounds, and 4 to 7 percent unidentified plant and other compounds. The two primary sugars of honey, glucose and fructose, are monosaccharides (simple sugars) and, as a result, do not require additional processing by the body to be digested. White sugar (a disaccharide) does need to be additionally processed.⁴⁵ Honey is, in health food terms, a live food, and as such, is easier to digest and better for the body. Fruits and vegetables, though high in vitamins, tend to lose them over time. Spinach, for example, will lose 50 percent of its vitamin C content within 24 hours after picking. Honey, on the other hand, stores its vitamins indefinitely. Wildflower honeys generally have the largest overall concentration of vitamins. Single-species honeys tend to increase concentrations of one vitamin to the detriment of others. For example, orange honey is relatively high in thiamin (8.2 micrograms per 100 grams) but low in nicotinic acid (.16 milligrams per 100 grams), while fireweed honey is low in thiamin (2.2 micrograms) and high in nicotinic acid (.86 milligrams).

Though the levels may seem small, honey as a consistent addition to food has shown remarkable results in medical trials. In an Austrian study prior to World War II, of one group of 58 boys, 29 were given two table-spoons of honey each day (one A.M. and one P.M.); the other 29 boys were given none. All received the same diet, exercise, and rest. All were the same age and in the same general health. The group receiving honey (after one year) showed an 8 1/2 percent increase in hemoglobin and an overall increase in vitality, energy, and general appearance.⁴⁶ Other studies in Switzerland and the United States echo these results. A number of modern researchers, in order to test the nutritional value of honey, have subsisted on diets of honey and milk for up to three months. In all cases they maintained their normal body weight and state of health.⁴⁷

One drawback of honey, in terms of mead production, is that fructose is harder for yeast to consume. As a result, fermentation of mead is a longer process than for beers made from other sugars. Initially, the yeast in a fermenting mead will form a vigorous frothy head, which then subsides. In any other type of beer, this would mean that fermentation is complete. However, with mead making, it only means that the glucose in the honey has been consumed. The yeasts are now working on consuming the remaining fructose sugars. This fermentation will be much slower and can easily take several weeks. The only way (besides experience) to tell if fermentation is actually complete is to taste the mead. If it is still sweet, fermentation is not complete. The drawback to this is that every time you expose the mead to air to taste it, you risk infection of the wort. But bottling too early will result in a highly carbonated beer that will either explode the bottles or foam vigorously when opened. Done correctly, mead will taste, depending on the type of honey used, like a fine, dry champagne or wine. And like wine, it benefits from lengthy aging in the bottle. It may be served uncarbonated, like wine, or carbonated like champagne.

POLLEN, LIKE HONEY, contains a number of unidentified plant compounds and other organics. The moisture content is about 25 percent, the rest being proteins, carbohydrates, fats, vitamins and minerals, and unidentified compounds.⁴⁸ The protein in pollen varies from 8 percent to 40 percent depending on the plant source, and it is exceptionally high in water soluble vitamins. It contains vitamins A, C, D, E, B1, B2, B6, niacin (200 mg per 1,000 mg of pollen), biotin, inositol, and folic acid. Pollen also contains minerals such as calcium, phosphorus, potassium (600 mg per 1,000mg of pollen), magnesium, iron, manganese, silicon, sulphur, chlorine, copper, and zinc. It also contains up to some 27 trace elements,⁴⁹ 17 percent of rutin (vitamin P),⁵⁰ and a number of ether oils, plant waxes and resins, flavonoids, and carotinoids.⁵¹ In one of the few studies on the difference between pollen before and after being gathered by bees, researchers found that the pre-bee pollen varies in caloric content from 5.56 to 5.97 calories per gram of weight (C/G). However, after the bee gathers the pollen, the caloric content increases to the range of 6.23 to 6.60 C/G.⁵² Bee pollen also contains a number of amino acids: arginine (4.7 parts per hundred—pph), histidine (1.5 pph), isoleucine (4.7 pph), leucine (5.6 pph), methionine (1.7 pph), phenylalanine (3.5 pph), threonine (4.6 pph), tryptophan (1.6 pph), valine (6.0 pph), and glutamic acid (9.1 pph). It also contains gonadotropic and estrogenic hormones and Human Growth Hormone Factor (HGH).⁵³

BEE POLLEN

Bee pollen has been recognized as a powerful food and medicinal substance for millennia: The ancient Egyptians recognized its importance in a number of their surviving writings, and the Greeks and Romans also used it extensively. Roman legions were issued the dried, pressed cakes of bee pollen as standard issue trail food while in the field. Written

accounts of its use exist among the ancient Chinese and Hindu cultures.

Pollen is a fine, powderlike substance, produced by plants as the male contribution—the semen—of plant reproduction. Plants utilize two types of pollination, one accomplished by the wind and the other by insects. Bee pollen, though often containing small amounts of the pollen from wind-pollinated plants, is primarily composed of pollen from insect-pollinated plants. Pollen grains are remarkably varied in color: yellow, buff, orange, purple, dark red, green, chocolate, and black. (Most of the darker colors are rejected by beekeepers who sell pollen. What you get when you buy pollen is usually limited to the yellow, buff, and orange colors.) Bees don't accidentally gather pollen—it is intentionally harvested for the hive's use. The bees carry the pollen from flower to flower during nectar collection, at each stop gathering more. A small number of the pollen grains are distributed to new flower heads during nectar collection, thus performing cross-pollination. But the vast majority are taken to the hive and stored as food for the bees. The bees carry the pollen in what most beekeepers call “baskets” on the bees' legs. The “basket” is actually a hollow or concave part of one joint on the bees' hind legs. When the bees collect the pollen, they mix it with a little nectar and some digestive juices into a soft mass and place it in the basket on their legs. Long elastic lances, like thick hairs, curve inward around the basket to hold the pollen in place. These spears, or lances, penetrate the pollen mass and keep it from dislodging. The majority of the pollen is carried back to the hive in this manner and stored in the comb as a food source, along with honey, for the bees and their young.

Honey provides a highly charged energy source that enables the bees to perform their work and also serves them as a winter food source. Bee pollen, sometimes called bee food, is also a major food source and contains many nutrients, most especially protein, not available in sufficient quantities in honey to meet the bees' needs. The freshly collected pollen varies a great deal in composition, depending on the plant species from which it comes and the weather.

Little really is known about the medicinal effects of plant pollens as opposed to bee pollen. Like the plant nectar that is altered to form honey, pollen is subtly changed in its interaction with the bees during transport to the hive. To my knowledge, no research has been conducted comparing the medicinal and nutritional effects of any pollen to the plant from which it comes. Such a highly concentrated part of medicinal plant species will inevitably possess medicinal actions, just as the leaves, seeds, and roots do. What little is known about pollen, its medicinal actions, and properties comes from the study of plant pollens after they have been transported and stored by the bees in their hive.

Rita Elkins's exceptional book on pollen and hive products (*Bee Pollen, Royal Jelly, Propolis, and Honey* [Woodland Publishing, 1996]) has some of the best information on the clinical uses and studies of pollen.

Pollen is perhaps the best single source of rutin and protein (assuming you have a high-protein bee pollen). Rutin strengthens capillaries, minimizes bleeding, and encourages coagulation, making it useful for those who bruise easily. The high protein content and other components in pollen have been found to enhance energy and endurance in people who consume it regularly. One British athletic coach, who participated in a clinical trial, noted

In October 1973, I was asked to test the efficacy of a bee pollen product. I was initially skeptical of the results likely to be obtained by the use of this product. However, I asked five athletes training under me to take bee pollen in accordance with the manufacturer's directions; that is, one to three pills a day. Within a period of 12 months, the athletic performance of all of the five athletes had substantially improved.⁵⁴

Bee pollen has been found to be antibiotic, antiviral, astringent, relaxant, tonic, and nutritive. It has been found effective in treatment of allergies, bacterial infections, asthma, capillary weakness, chronic fatigue, immune depression, menopausal symptoms, nutritional disorders, prostate problems, chronic cystitis, and urinary tract infections.

The primary use of bee pollen as medicine has traditionally been nutritive. Chicken embryo heart growth was found to accelerate when treated with pollen extracts, and gastrointestinal damage in test animals was reversed with a significant increase in weight after taking bee pollen extracts, and two studies on hospitalized children showed significant weight gain and increased serum protein levels when bee pollen was added to their diets.⁵⁵ Pollen is so good as a nutritive medicinal that researchers at the Royal Society of Naturalists in Belgium and France noted, “The nutritional tests supervised by the station at Bures on hundreds of mice have demonstrated that pollen is a complete food, that it is possible to let several generations be born and live without the least sign of distress while nourishing them exclusively on pollen.”⁵⁶ A number of clinicians have commented that it is so effective as a nutritive food that human beings could live on nothing more than a diet of pollen and water.

In countries from Japan to Brazil researchers have used bee pollen in treating a number of prostate problems: prostatic hypertrophy, chronic prostatitis, and prostatic vesiculitis. “The experimental-clinical results point to the fact that pollen

extracts can be very valuable as specific drugs in the therapy of [prostate illness].”⁵⁷ In one Japanese clinical trial on the effects of bee pollen on urination disorders caused by prostatic hyperplasia, researchers noted that “sense of residual urine improved 92%, retardation improved in 86%, night frequency improved in 85%, strain in urination improved in 56%, protraction improved in 53% and the force of the urinary stream improved in 53%.”⁵⁸ Numerous other studies showed similar results. Even more studies have shown its beneficial effects on prostatitis. One-third to one-half of the patients in clinical trials reported a complete cessation of symptoms; 75 percent noticed significant improvement. No side effects have been noted in any patients. As one report noted, “In vitro studies suggest that [bee pollen] is a potent cyclo-oxygenase and lipogenase inhibitor and a smooth muscle relaxant.”⁵⁹

A number of researchers have noted “unambiguously good” results from use of pollen extracts in treatment of chronic cystitis and urinary tract infections. One component in pollen, B-sitosterin, was identified as strongly anti-inflammatory and of especial use in cystitis. Researchers commented, however, that there were obvious synergistic actions in pollen that they did not yet understand, noting that the isolated B-sitosterin was not as effective as the bee pollen itself when used for the same conditions.⁶⁰

Though the flavonoids in pollen are not as high as in propolis, another hive product, “these very widespread floral compounds also play a determining role in the medicinal effects” of pollen.⁶¹ Flavonoids provide antiviral action through their ability to stop viral cells from breaking open and infecting the viral host (i.e., us). This antiviral activity combines well with its antibacterial action. Pollen has been found to be effective against *Escherichia coli*, *Proteus*, *salmonella*, and some other strains of *colibacillus*.⁶² It has been found in clinical trial that people who consume bee pollen regularly have significantly fewer upper respiratory infections.⁶³

Bee pollen was also found to significantly reduce the side effects from radiotherapy. In one trial, women being treated for inoperable uterine cancer experienced less nausea, stronger immune system response, an increase in red and white blood cell count, good appetite, and less weakness and sleep disruption.⁶⁴

Many people with hay fever, allergies, and asthma have experienced good results from the use of bee pollen in alleviating or improving symptoms. The HGH hormones in pollen seem to play a significant role in increased body weight and healthier growth in both clinical trials and empirical studies. In studies in Turkey, bee pollen has been found to be effective in the treatment of male impotency, low sperm count and motility, and male sexual drive.⁶⁵ Researchers are presuming the gonadotropic hormones in bee pollen play a role in these results. Conversely, the presence of estrogenic hormones seem to help explain the effectiveness of bee pollen in alleviating the symptoms of menopause in women.

Many of the properties of pollen are in the ether oils and plant resins that are not easily water soluble. Ingesting either the bee pollen itself or an alcohol and water extract, or else including it in fermentation is best.

Unlike propolis and honey, bee pollen does not keep well; the fresher the better. The medicinal activity of pollen over one to one and a half years decreases sharply.

PROPOLIS

There is a balm in Gilead that makes the wounded whole;

There is a balm in Gilead that heals the sin-sick soul.

—From an old Christian hymn

Propolis, called Balm of Gilead in the Bible, is a gummy, resinous substance gathered by bees from the leaves and bark of trees. It is gathered from such trees as aspen, poplar, birch, elm, alder, horse chestnut, willow, pine, and fir. The Balm of Gilead—known to the Muslims as balsam Mecca—was gathered from the Middle Eastern evergreen *Commiphora opobalsamum* and the tree from which myrrh comes, *Commiphora absynnica*.⁶⁶ However, bees who have hives where there is insufficient tree growth will resort to other substances, such as paint, rubber compounds, and asphalt—not the kind of propolis to take for health.⁶⁷ In gathering the resin, the honeybee bites into the sticky substance and transfers it to the pollen basket on its hind legs. It is taken back to the hive, where another bee unloads it for use.

The tree resin is combined by the bees with nectar, pollen, wax, and their own enzymes to make the final propolis mixture. It is then applied to cracks and holes as a sealant in the hive, and it lines the entrance to the hive. Propolis protects the hive from contaminants and sterilizes returning bees as they enter the hive. It is a stabilizer, cement, insulator, filler, varnish for the comb, and antiseptic.

Propolis varies in color from light yellowish-green to a dark brown, depending on the plants from which it is gathered and its age. When warm, it is sticky and pliable (as you might expect in a resin), but when cold, it is hard and brittle.

Though rarely used in medicine in the United States, propolis has a long traditional and contemporary use in Western and Eastern Europe. It was widely prescribed by Hippocrates, and in the first century A.D., Pliny the Elder noted that “current physicians use Propolis as a medicine because it extracts stings and all substances embedded in the flesh, reduces swelling, softens indurations, soothes pain of the sinews, and heals sores when it appears hopeless for them to mend.” It was used throughout the Middle Ages and even recommended by Culpepper for inflammations and fever.⁶⁸

Propolis has more bioflavonoids than oranges—a major bioflavonoid source—and contains all the known vitamins except vitamin K and all the minerals needed by the body except sulphur. It is composed of 50 percent tree resins, 30 percent wax, 10 percent bee pollen, and 10 percent essential oils. As with honey and pollen, not all the compounds in propolis have been identified.⁶⁹

Propolis has been found effective as an antibacterial, vulnerary, antiviral, antibiotic, antifungal, anti-inflammatory, antioxidant, antiallergenic, immune system enhancer, and antiseptic. It retains these qualities, when stored under proper conditions, for many years. Propolis has been used in Soviet medicine to effectively treat tuberculosis (TB), gastric and duodenal ulcers, eczema, puritis, and septic wound infections. Standard Russian clinical practice for TB recommends 15 to 30 grams of propolis two to three times per day or 15 to 35 drops of an alcohol extract for from one to three months. Ulcers are treated with 12 drops of the extract three times a day for 30 to 35 days. Use has alleviated the heartburn, pain, nausea, and vomiting concomitant with ulceration. Soviet physicians have effectively used propolis in the treatment of juvenile ulcerous stomatitis. The propolis is tinctured one to four in 95 percent grain alcohol and, after tincturing, an equal volume of water is added to the tincture. Dosage is as above.⁷⁰ Research has shown that propolis is inhibitory to *Helicobacter pylori*, the bacterium that causes ulcers.⁷¹ The propolis solution described above, 60 drops in a glass of water, used as a gargle, has been found effective in sore throats from colds and flu.

Skin diseases and infected wounds are treated topically,⁷² and propolis has been found to be highly effective in the treatment of herpes zoster. Use of a 5 percent propolis solution in 20 cases of herpes completely reduced pain within 48 hours and significantly advanced sore-healing time.⁷³ Romanian clinicians have used propolis in the treatment of severe acne, prostate inflammation, mouth infections and dental cavities, and burns. Acne and prostate inflammation have been treated with propolis in capsule form. Mouth infections and burns have been treated topically.⁷⁴ Propolis has been used with success in filling cavities, preventing further decay, and killing the invading bacteria.

In antiviral studies, a number of compounds in propolis have been found to highly inhibit the replication of various virus types. In combination, these compounds show a highly synergistic activity, producing inhibition beyond their individual activity.⁷⁵ Propolis apparently strengthens the virus’s protein coat, keeping it isolated from any organism it enters by inhibiting the enzyme that allows the virus to break out of its shell. Propolis also has been found to stimulate phagocytosis and speed detoxification.⁷⁶ As such, it has been found to be effective in the treatment of colds and flu. In addition, it seems to obviate fatigue when taken as a daily supplement.

Both alone and in combination with honey, propolis has been found highly effective in the treatment of serious burns. Russian physicians note that it curbs inflammation, disinfects, and stimulates new skin growth.⁷⁷ Additional controlled trials were preformed in the Netherlands: patients with serious bone necrosis and infection that would normally require amputation and in which standard medical protocols were ineffective were effectively treated with a honey and propolis combination.⁷⁸ And Polish studies using propolis found it to inhibit antibiotic-resistant strains of *Staphylococcus aureus*.⁷⁹

Researchers at Columbia University found propolis effective against cancer, inhibiting abnormal cells without affecting normal ones. The Columbia researchers commented that “caffeic acid esters, present in the Propolis of honeybee hives, are potent inhibitors of human colon tumor cell growth.”⁸⁰ Traditionally, propolis was difficult to remove from the hives, though modern beekeepers have developed methods to make removal easier. Historically, when mead was made from honey, as noted earlier, the greater portion of the comb, including large amounts of propolis, was taken and boiled to produce the wort from which mead was made. The propolis content of such a historical mead would have been high.

ROYAL JELLY

Royal jelly is a truly unique creation of honeybees. It is synthesized by “nurse” bees—young worker bees between 5 and 15 days of age. The royal jelly is synthesized by the nurse bees’ hypopharyngeal glands from a diet of bee pollen and honey. It is a thick, creamy, milky-white substance upon which the queen bee feeds. Royal jelly has remarkable effects upon the

queen bee. Born no different from other bees, her life is extended from the usual six weeks that most bees enjoy to five years. She grows to 17 millimeters in length and attains a weight of 200 milligrams, as compared to the normal bees' length of 12 millimeters and weight of 125 milligrams. The queen lays approximately 2,200 eggs each day (200 times her body weight), more than 2,000,000 in her lifetime—a feat no other creature on Earth equals.⁸¹ The eggs laid by the queen that are destined to become queen bees are identical in every respect to eggs that become workers—the only difference is the exclusive diet of royal jelly that makes a bee a queen. Worker bees, during the larval stage, are given royal jelly for a period of about three days. Royal jelly is even more complex than the other hive products. Like those, scientists have been unable to identify all the compounds of royal jelly. Synthetic royal jelly has been made and marketed, but used on young bees it fails to produce queens, and it does not produce the same effects in clinical trials on people as those produced by bee-produced royal jelly. Whereas honey, propolis, and bee pollen all differ from location to location and country to country, no differences have been found in the royal jelly produced by bees throughout the world. Moisture content is about 66 percent, protein 12 1/2 percent, fat 5 1/2 percent, carbohydrates 12 1/2 percent, and 3 1/2 percent of the content of royal jelly has not been identified. Due to the high moisture and nutritive content of royal jelly, it should be an excellent medium for bacterial growth, but it is not—neither in the hive nor out. One compound of royal jelly that might explain this is 10-hydroxy-2-decenoic acid, which possesses strong antibacterial and antifungal activity and makes up 2 to 3 percent of royal jelly.⁸² Royal jelly is rich in bee pheromones; natural hormones; amino acids (including all eight essential amino acids), particularly cystine, lysine, and arginine; B vitamins, especially pantothenic acid (B5); nucleic acids (including DNA and RNA); sugars, sterols, fatty acids, phosphorus compounds, and acetylcholine.⁸³

Pantothenic acid helps arm the human body against infection, helps process nutrients, and has shown antiaging effects in clinical trials. Studies have shown consistent and significant increases in the life spans of lab mice fed a pantothenic acid-enhanced diet.⁸⁴ Dr. Albert Saenz, in his report “Biology, Biochemistry, and the Therapeutic Effects of Royal Jelly in Human Pathology” (1984) remarking on trials held by the Pasteur Institute of Paris, noted that royal jelly showed remarkable effects in a number of areas. Patients with high blood-serum cholesterol levels who were given royal jelly showed a normalization of readings, patients with Buerger’s disease (thromboangiitis obliterans—another arterial disorder) showed significant improvement of symptoms, and elderly patients with mental disturbances and senility also showed significant improvement—probably due in part to the high acetylcholine levels of royal jelly. Acetylcholine plays a crucial role in the transmission of impulses from one nerve fiber to another across synaptic junctions, making it highly useful in the treatment of Alzheimer’s disease, Parkinson’s disease, and multiple sclerosis. Trials have shown that the trembling associated with Parkinson’s disease is markedly reduced in patients taking royal jelly. Saenz also reported that royal jelly showed significant positive effects in treating “deficiency states, referring to malnutrition, slow convalescence after illness or operation, physical or mental exhaustion, loss of appetite, and abnormal loss of weight caused by anorexia nervosa.”⁸⁵ Researchers in Greece have shown that royal jelly produces significant effects in the treatment of arthritis. And trials in Argentina have documented the high levels of gamma globulin and a precursor to collagen in royal jelly. Use of royal jelly by those researchers in clinical trials produced significant antiaging effects in patient populations, not only slowing tissue degeneration but, in some cases, reversing it completely.⁸⁶ Clinical trials at the University of Sarajevo showed that royal jelly possesses strong antiviral activity. When combined with propolis and honey (10 percent royal jelly) and diluted 1 to 10, significant antiviral activity was detected in the patient population. Only 6 percent of the trial subjects receiving the dilute solution suffered viral infections; 40 percent of the placebo group became ill.⁸⁷ Canadian researchers in trials on nearly 1,000 lab mice found significant antitumor activity in royal jelly. A mixture of active tumor cells and royal jelly were injected into one group of mice, active tumor cells alone into another. All the mice receiving royal jelly survived with no incidence of tumor growth; the non-royal jelly mice all died within 12 days.

Royal jelly is considered antibacterial, antiviral, antibiotic, antitumor, tonic, nutritive, antiaging, euphoric, alterative, adaptogenic, a hormonal normalizer, and antidepressant. It targets nearly all the systems of the body: immune, cardiovascular, endocrine, integumentary, nervous, reproductive, cellular, skeletal, hepatic, and respiratory. Dr. H. W. Schmidt, in a lecture before the German Medical Association in October 1956 remarked:

The effects of the active substances and nutrients contained in royal jelly take place throughout the entire body [and it] regulates all [its] functions. From all the investigations and observations that have been made with royal jelly, it is apparent that this substance is a powerful agent composed of hormones, nutrients, enzymes, and biocatalysts. Royal jelly revives and stimulates the functions of cells and the secretions of glands. It also steps up the metabolism, and stimulates the circulatory system. To summarize, . . . [it] works to preserve life and strength in the organism, . . . delays the aging process and helps the organism retain for as long as possible the physical freshness of the body, elasticity of the mind, and psychic buoyancy of youth.⁸⁸

Although clinical trials have not been conducted on reviving sexual function, royal jelly has a long history (some 4,000 years) of normalizing or revitalizing exhausted sexual function. Royal jelly also produces a natural “high” or euphoria when

consumed that has occasioned comments by a number of researchers. The use of royal jelly is extremely ancient, especially in China, where it is used in a great array of products from skin care to medicines. Interestingly, the Chinese have made a royal jelly wine for many thousands of years.

The scientific evidence for the efficacy of royal jelly is strongly supportive of the claims that have been traditionally made for the use of meads and honey in diet—that they produce remarkable effects on health, mental functioning, sexual activity, and life span.

BEE VENOM

It may seem odd to also include bee venom in this chapter on meads, but it does have its place. Angry bees were often an inadvertent ingredient of mead making. A hive was located, dug out of its hiding place, and the whole thing placed in a kettle to cook off the wax. The bees were anything but passive in this process. Bees, bee larvae, and the queen were often still present in the hive, and angry worker bees ferociously assaulted the hive stealers, following the hive as it was moved. These might seem to our modern sensibilities somewhat unsavory additives to the brew, but are quite important in their own right. At their most basic, the bees and larvae are significant protein sources, but they also include the other thing that the bee is best known for besides honey—its sting.

Bee venom was widely used in nineteenth-century medicine and is enjoying a strong resurgence today in many parts of the world. Today it is often used clinically through the stinging of live bees, but formerly it was used as Apis extract. King's American Dispensary, authored by John Uri Lloyd and Harvey Felter in 1895, described its production for use by physicians. It involved taking a swarm of live honeybees, placing them in a large jar, and shaking it vigorously to "excite their anger." Alcohol was then added to the jar, the mixture left for a month, and the resulting solution then strained for use. Apis was specific for urinary tract and bladder infections, sore throats, hives and skin inflammations, coughs and colds, and neuromuscular disorders. It was considered diuretic, diaphoretic, anti-inflammatory, and alterative. King's American Dispensary (Cincinnati: Eclectic Publications, 1895) notes:

We have known of well authenticated cases, where individuals suffering from rheumatism have been cured of that complaint after having been severely stung by the hivebee. We do not recommend this form of hypodermic injection, but prescribe [Apis] for rheumatic conditions with blanched puffiness and the peculiar stinging pain.⁸⁹

Research and clinical practice in the latter part of this century have shown bee venom to produce significant positive results in the treatment of rheumatoid arthritis, gout, multiple sclerosis, lupus, neuralgia, and shingles.⁹⁰ Russian research has shown that bee venom blocks the transmission of stimuli to the peripheral and central synapses, strongly influencing the nervous system. It raises the functional activity of the hypophysial-adrenal system, prevents development of convulsive states, is hypotensive, anticoagulant, and expands blood vessels in the brain. Russian clinicians have successfully used bee venom to eliminate prethrombosis states in patients suffering from atherosclerosis and thrombophlebitis.⁹¹ A number of bee venom advocates have insisted that live bee venom (that is, an actual sting) is more efficacious than Apis or other forms of gathered bee venom. However, research by a number of clinicians over a five-year period of time failed to find any significant difference in outcomes in treatment of arthritic patients between live venom and collected venom. No toxicity has been reported in arthritic patients who use bee venom therapy.⁹² Sixty-five to 75 percent of the patients with arthritis who used bee venom therapy in clinical trials experienced success with the treatment. Bee venom has been shown to be one of the most potent anti-inflammatories known. One of its components, mast cell degranulating peptide—peptide 401—has been shown to be 400 times as powerful as cortisone. However, hip joints are one of the few areas of the body that do not respond to bee venom.⁹³ Bee venom is no longer collected in the manner John Uri Lloyd described in 1895; today, electric shock stimulates the bees to sting and the resultant venom is collected. Venom consists of a large number of peptides, enzymes, and amines—the exact makeup and action are not understood.⁹⁴ Interestingly, many of the compounds in bee venom also exist in stinging nettles. And nettles have shown positive activity in many of the same conditions for which bee venom is used, such as multiple sclerosis, arthritis, gout, urinary tract inflammation, and hives.⁹⁵

The original meads, made with angry bees included, certainly appear similar to the process of making Apis. It seems quite likely that bee venom was an active component of the ancient healing meads.

HIVE PRODUCTS AND HEALTH

The long-lived of antiquity who ate a diet primarily composed of bee products is impressive: Pythagoras, the Greek philosopher and mathematician, lived to the age of 90. His disciple, Apollonius, lived to 113. A bee hive. Anacreon, another Greek of antiquity, lived to 115. The Greek Democritus, perhaps one of the world's greatest physicists, lived to 109.

Pliny the Elder researched the ages of people living exclusively on honey and hive product diets late in the first century

A.D. He found that in the region of the Apennine mountains, there were an anomalous number of people more than 100 years of age. Fifty-four were 100, 57 were between 100 and 110, 2 were 125 years old, and 7 were 135 years of age or older. In Parma, he located 5 who were more than 125, and nearby another 11 more than 100.

Piast, the King of Poland in A.D. 825, was a beekeeper who subsisted primarily on honey and other hive products. He lived to be 120 years of age. One Hebrew tribe, the Essenes, were noted beekeepers and were renowned for their great age—many passing 100 years.

Plutarch (A.D. 46–A.D.120) observed that the Britons, who subsisted on great amounts of honey, “only begin to grow old at one hundred and twenty years of age.”⁹⁶ The original Bardic name of the British Isles was “the Honey Isle of Beli”—beekeeping was a major industry and honey one of its principle commodities. When Pliny the Elder visited the British Isles, he commented that “These islanders consume great quantities of honey brew.”⁹⁷ A pre–World War II investigation of tombstones in Britain noted that there were many long-lived Britishers who ate a great deal of honey from the comb. A few: Sir Owen of Scotland died at 124 years of age, his last son was born when he was 98, and he walked 74 miles in six days in the last year of his life. Peter Garden, a Scot, died at the age of 131, keeping the appearance of a young man until the very end. William Ellis—130; Mr. Eccleston, Irish—143; Colonel Thomas Winsloe, Irish—146; Francis Consist—150; John Mount, Scot—136; Thomas Parr—152. And throughout the world beekeepers and mead drinkers have been reputed to enjoy extremely long life and good health.⁹⁸ Sir Kenelm Digby (see appendix 2) remarked on this when he commented about one of his mead recipes that

This Meath is singularly good for a consumption, stone, gravel, weak-sight, and many more things. A chief Burgomaster of Antwerpe, used for many years to drink no other drink but this; at Meals and at all times, even for the pledging of healths. And though he were an old man, he was of an extraordinary vigor every way, and had every year a Child, had always a great appetite, and good digestion; and yet was not fat.⁹⁹

Perhaps the most interesting example of remarkable health from modern day is that of Noel Johnson, who at the age of 70 and in poor health began eating a diet consisting largely of honey and hive products. At the age of 90 (1993) he was title holder of the World’s Senior Boxing Championship and a seasoned marathoner competing in events on every continent on Earth. He looks to be about 55 years of age. Too, consumption of mead and honey have long been reputed to enhance sexual prowess and fertility in all cultures that make extensive use of honey. In part, this reflects the procreative supporting properties of royal jelly and bee pollen. Hindus have long eaten honey to increase virility and our own term honeymoon comes from the ancient European practice of newlyweds eating nothing but honey for the first 30 days after marriage (a practice that was instituted to increase fertility of the couple and enhance the possibility of an immediate pregnancy).

Though these reports are anecdotal, science is beginning to bear them out in many areas of research. There is good reason to believe that the remarkable properties of heather and honey together produce all the effects attributed to the ancient Mead of Inspiration