



A P A S S I O N F O R

Chocolate



Once upon a time a prince went to battle, to defend the borders of his father's kingdom against a hostile tribe. His wife, the princess, was left to guard the kingdom's vast treasure. The invaders were fierce—they defeated the prince's army and advanced on the capital city. Alarmed, the princess hid the treasure. The barbarians took the city, captured the princess, and ransacked the royal keep, seeking the treasure. Not finding it, they tortured the princess. Despite her prolonged suffering, she did not reveal the treasure's hiding place. Enraged, the barbarians killed her. But from her blood sprouted the cacao plant, and ever since that time people have known that there is treasure hidden in its seeds, as rich and strong as love itself, but as bitter as love torn asunder.

This is one of the Aztec legends concerning the origin of the cacao tree. The more common legend, the story that predates the apex of the Aztec culture, involves the man-god Quetzalcoatl, who was led into paradise, the realm of the sun god. On his return to the world of men, Quetzalcoatl brought cacao seeds with him.

Both of these legends speak to the reverence that the peoples of Central and South America hold for cacao. They call it “the food of the gods.” What else but chocolate could live up to the name?

Chocolate is the world’s favorite flavor. There is a mystery, excitement, and wickedness associated with chocolate you’ll find in no other food. Chocolate desire is expressed with a sense of mischief; more than sneaking a few potato chips or a second order of nachos, indulgence in chocolate—indeed, the very mention of the word chocolate—evokes wanton giggles and stabs of guilt. Chocolate passion is akin to its sexual counterpart in so many ways. Consider the gleam in a person’s eye when the subject of chocolate is raised, the anticipation when it is near, the rapture when it is enjoyed.

For the past 15 years, we at *Chocolatier* magazine have experienced America’s passion for chocolate firsthand. We’ve seen a steady growth in Americans’ chocolate consumption, as well as an increase in the quality of chocolate and the sophistication of consumers. Americans have begun to appreciate the simple, unadorned chocolates fashioned by hands-on craftsmen: truffles or pralines—delicate, balanced confections that melt perfectly and impart a quiet silken wave of chocolate flavor. They are willing to pay a little more for quality. They can appreciate the subtle, European-style filled chocolates, and are developing a taste for dark chocolate. But Americans will never lose their love for chocolate bars studded with nuts, peanut butter, caramel, nougat, or coconut.

At our restaurants and hotels, pastry chefs fashion chocolate desserts into towers, stoves, pianos, cones, and pyramids. And that’s

Crunching the Numbers

- ↔ The average American consumes 12.1 pounds of chocolate per year. Americans have, on average, increased their chocolate consumption by 2 pounds over a 13-year span.
- ↔ 3.1 billion pounds of chocolate are purchased per year in the United States.
- ↔ The manufacturer value of that 3.1 billion pounds of chocolate is \$7.6 billion.
- ↔ \$11.7 billion is spent by Americans on chocolate products every year. Approximately \$600 million of that amount is spent in February, for Valentine’s Day.
- ↔ The percentage of Americans who expressed a preference for milk over dark and white chocolates: 73%.
- ↔ The people of Switzerland consume more chocolate than the citizens of any other country in the world: 20.7 pounds per person per year. Switzerland is followed by Austria (19.6 pounds), Germany (18.6), Belgium/Luxembourg (18.4), Norway (17.4), United Kingdom (16.8), Denmark (16.0), United States (12.1), Sweden (11.2), Ireland (11.0), France (10), Netherlands (9.6), Finland (7.2), Italy (5.4), and Spain (3.3).

Sources: U.S. Department of Commerce (1996, 1997), CAOBISCO Secretariat, Brussels (1997), and Chocolate Manufacturers Association of America.

just the beginning. People want their chocolate in the form of an Easter egg or bunny, a Santa, a pumpkin or a valentine, a lion, a tiger or a bear, a car, truck or plane, a baseball, golf ball or puck, a champagne bottle or hatbox (filled with truffles), a chocolate videotape, a company plaque or business card, a chocolate photo (see yourself in chocolate!), a flower, leaf or rock, or a body part molded in chocolate—and we do mean any body part. Chocolate is formed into regional maps, state parks, and mountain ranges. Chocolate pizza features drizzles of white chocolate to represent the mozzarella. Chocolate serves as the canvas for re-creations of Monet paintings in edible paint. Chocolate enrobes potato chips, pretzels, and insects. It is combined with liqueurs, fruits, and jalapeño peppers. Adventurous chefs create all-chocolate meals featuring chocolate pasta, shrimp swimming in a chocolate sauce, and, of course, chicken in a mole sauce. We have known people who take a bite of every piece in a variety box and leave the bitten pieces for the next person, without apology. Some people who claim to eat a pound every day say that it is the secret of their health and longevity. We have seen women with their bodies entirely dipped in chocolate (not as pretty a sight as you would imagine). We have sampled chocolate body paint and its rival product, chocolate body frosting. Chocolate inspires toys: we've seen a Choco-holic Relief Spray, a Chocolate Deprivation Survival Kit, and a chocolate “patch” to help relieve chocoholics of their craving. The intoxicating scent of chocolate is the basis for a chocolate body wash and cocoa-scented soaps. We've sampled chocolate cologne. Chocolate beer. Just when we think we've seen it all, someone devises another chocolate something. And we are kids again.

Why does chocolate arouse such passion? Like any passion, there are reasons, but no final answers. Like any passion, it is best not to analyze it too much, or the mystery is ruined. Here are some obvious reasons why chocolate is the world's favorite treat.

THE MOUTHFEEL Cocoa butter, the fat in chocolate, melts at almost exact body temperature. Other foods melt, of course, but there is that moment in chocolate in which it is neither solid nor liquid, both and neither. All the while it is sending sparks of that flavor, vibrating deliriously from the mouth to the extremities. Or as a scientist would explain, heat is absorbed from the lining of the mouth, which creates a most pleasurable sensation.

PLEASANT MEMORIES We associate chocolate with comfort, good times, and special occasions of childhood. When we enjoy chocolate, we evoke these memories.

CRAVINGS Food chemists point to chocolate's combination of fat, sweet and carbohydrate ingredients; the survival mechanisms in our brain are naturally attracted to this cocktail. Some have theorized that chocolate releases opiates in the brain; cravings may be linked to this desire on the part of the brain for chemicals such as serotonin.

PRIMAL INSTINCT Giving sweets to loved ones is primal behavior—primates really do it. While a taste for hot and bitter foods is acquired, we were all born with a love of sweets.

FLAVOR The primary reason we love chocolate is for its rich flavor, mouthfeel, and aroma all working as one.

Composition of Chocolate

Chocolate is a complex food, and this may account, at least in part, for its marvelous flavor. So far, scientists have identified some 400 compounds in the cacao bean, twice as many as the closest other food. They think there may be as many as 1200.

Over half of a chocolate nib (the shelled bean) is fat. Ten percent is protein and starch. The rest is composed of these 400 (and counting) biochemical and pharmacological components. They include polyphenols, which are flavonoids; amino acids, which contribute bitter and sweet tastes; organic and phenolic acids, whose influence on flavor is unknown; carbohydrates, including glucose, fructose, and sucrose; pectins, cellulose, crude fiber, mucilage, and gums; and ash, tannins, and magnesium. There is serotonin, a mood-enhancing hormone also found in the brain, and phenylethylamine. There are the alkaloids: tyramine, caffeine, and theobromine, which are stimulants.

To date, chemists have not been able to understand the nature of chocolate flavor, which is the sum of hundreds of these substances. There have been attempts to manufacture a synthetic chocolate, based on the known compounds. They have failed, and many tests with human subjects to satisfy cravings with similar foods or components of chocolate in combination also fail. The international craving for chocolate appears to be more than can be explained by brain chemistry, sensory pleasure, or childhood memory.

A History of Chocolate

Chocolate passion may not be hardwired into the human brain, but men and women *have* enjoyed it in one form or another for thousands of years.

The genus *Theobroma* dates back millions of years. It evolved, for the most part, on the eastern slopes of the Andes in South America. There are some 22 species of *Theobroma*. The species *Theobroma cacao*—the only species that produces beans that will create chocolate—probably first appeared ten to fifteen thousand years ago. This is roughly the same time that the human species began to populate that region of the world.

In that primeval jungle, under the canopy of trees, in the oppressive heat and humidity, cacao beans waited. They sat in a milky pulp, enclosed in a pod, on a slender tree. The first to discover the beans were animals—monkeys, squirrels, rats, and bats probably chewed on the pods to get to the pulp, or they would wait for the pods to burst and then feed. At first, the primitive mountain people mimicked the animals and fed on the pulp. They ignored the seeds, which were bitter. These discarded seeds then had a chance to sprout into new cacao trees.

At some point, these cultures discovered that the beans tasted interesting, or at least different, if they fell on the ground and were exposed to the sun—if they fermented, in other words. Once washed, they would have been ready to be pulverized, perhaps by members of the next generation. Roasting? Primitive peoples were always throwing things in fire, and quickly learned its alchemical properties.

The cacao that first appeared in the northern and western portions of the Upper Amazon Basin is the antecedent to the form forastero. The type that eventually came to be known as criollo originated in pre-Conquest Mesoamerica (the highly cultured areas of southern Mexico, Belize, Guatemala, and corners of El Salvador and Honduras).

THE DEMISE OF QUETZALCOATL

We know some specifics of the cultures that first domesticated cacao. The civilization of the Olmecs flourished in the rich lands of the Mexican Gulf coast, peaking around 1500 B.C. and beginning to dwindle about 400 B.C. It is believed that a word similar to cacao was in their vocabulary.

The Mayan civilization reached its apex around 250 A.D. The Mayans established the first known cacao plantations. Legends point to King Hunahpu, the third Mayan king, as the one who encouraged this cultivation. It is through Mayan writings that the word cacao (*u kakaw*) first appears. Archeologists have unearthed elaborate and substantial pots, tools, and other containers that clearly indicate chocolate use, and its importance in their culture. Between 800 and 900 A.D., in what historians call the Collapse, the Mayans suddenly abandoned their magnificent cities. Possible reasons are the decay of their environment due to humidity and heat, the aggressive growth of surrounding jungles, and overpopulation.

The Toltecs moved into the territory abandoned by the Mayans. The culture of the Toltecs thrived between the decline of the Mayans and the true ascent of the Aztecs. They also knew of cacao beans; they called them “sun beans.”

Chocolate by Any Other Name . . .

*W*here do the words “cacao” and “chocolate” come from?

Though there is no written record, historical linguists have traced a word roughly pronounced “kakawa” back to the Olmecs (1500 B.C.). The word was passed down to the Mayans; the word “ka-ka-w” first appears in their writings (250 A.D.), and it was probably their word for the tree and the beans.

The Mayans also formed a word for the substance extracted from the bean and the beverages made from it: xocolatl. This word is most probably a combination of the native words xoco (bitter) and otl (water). But easily the most appealing theory for the origin of the word comes from Thomas Gage, in a 1648 essay entitled “New Survey of the West

Indies.” Gage expresses the belief that the word is a combination of the Indian words *atta* (water) and *choco*, from the sound made when cacao paste and water are stirred with a molinet: *choco, choco, choco*.

The Aztecs (1400 A.D.) inherited both the word for the tree (*cacahuatl*) and the word for chocolate (*xocolatl*) from the Mayans. Europeans adapted the pronunciation and spelling of the word, to give us chocolate.

Today, we use the word cacao (ka-KOW) to refer to the tree, the pods, and the unfermented beans. Once the beans have fermented, they are referred to as cocoa beans. And cocoa, is, of course, the word we use for the powder used for drinking, food manufacture, and dessert-making.

It is from this powerful, cultured people that the myth of the man-god Quetzalcoatl springs. Over the centuries, the story of this simple man and his exile was passed from the Toltecs, to become a part of Aztec mythology. It is a unique example in history, many historians feel, in which myth and reality collide—a circumstance that perhaps accounts for the Aztecs’ maddening passivity and generosity toward the plundering Spanish some 600 years later.

Quetzalcoatl was the political leader of the Toltec nation in the tenth century; though he was a wise and popular leader, plots from within his palace forced Quetzalcoatl to flee his capital in northern Mexico. He finally settled in a small town, Tollan, in what is now the Yucatán. It is here that legend replaces history: there are stories of a lavish treasure stored in Tollan—gold, silver, gems, and cacao trees of many colors. But three evil sorcerers trick Quetzalcoatl into drinking a beverage that drives him insane. Setting sail on a raft of snakes Quetzalcoatl is disguised, or transformed, into a serpent god. As a hint of the treasures to come, Quetzalcoatl gives mankind cacao. He promises to return, and he is specific: According to the Aztec calendar, he will return in a year falling under the sign of *Ce-acatl* (“one reed”) to the same place (the eastern coast of Mexico), bringing with him an entire palace bulging with a treasure of the gods.

AZTEC NATION

The ascent of the migrating Aztecs coincided with the decline of the Toltec culture. The two warred in 1325, and the conquering Aztecs settled in the Valley of Mexico. They set about vanquishing neighboring city-states. By 1375, they had a king, an army, a government, and a culture in place. They established as their capital Tenochtitlán, and constructed dazzling, imposing palaces, public buildings, temples and common areas. The Aztecs’ was a sophisticated culture, with an estimated 10 to 11 million people, 200,000 of them living in the capital. Although human sacrifice was a part of their culture, the scale and barbarity were probably exaggerated in accounts by the disapproving Europeans (particularly the priests), and these accounts have been passed down and reinforced through the ages.

Cacao was an important part of the economy and culture of these peoples, so how barbaric could they be? They believed that cacao conferred a sort of cosmic wisdom that would continue in the afterlife.

For the most part, the Aztecs and Mayans consumed their chocolate in liquid form. After fermentation, they dried the seeds in an earthen pot over a fire. Then they broke the seeds with stones and ground them into a “flour”; they transferred the flour to gourds and moistened it gradually with water, adding “long pepper” (chili) and perhaps maize and other spices as they went. Often they would beat the liquid or pour it from vessel to vessel; this was to give the drink a frothy, foamy crest, which was very highly prized. This procedure might have also allowed the fat to rise to the surface so that they could skim it off. Once it was sufficiently foamy, they drank it. This was the basic chocolate recipe of the Mesoamerican peoples and, to contemporary palates, it would have been a bitter drink indeed.

Both the Mayans and the Aztecs developed several additional “recipes” for chocolate. These recipes probably evolved as these cultures matured, and they would have been employed only to honor a personage of high status. These chocolate recipes included porridges, powders, possibly solids, and

drinks that were flavored in a variety of ways and perhaps colored red or green. It is documented that Montezuma ordered retainers to obtain snow from mountaintops and pour it over his xocolatl, to make a sort of bitter chocolate snow cone.

The Aztecs were known to flavor their chocolate with chili peppers (a very pleasant burn to the drink), fruits, vanilla (which was native and familiar to them), honey, allspice, and pita juice. The drink was served either hot or cold, but in general the Aztecs preferred their chocolate drink cold, while the Mayans drank it hot.

Sometimes, perhaps for storage or transportation purposes, the chocolate paste, rather than being immersed immediately in water, was shaped into loaves (about the size of an adult fist) by wrapping it in leaves of maize and binding it with grass stalks. To make xocolatl, the loaves were unwrapped, grated, and melted in a lightly salted corn mush. Another way of treating the loaves was to heat the chocolate to the point at which the cocoa butter melted; it was then molded and cooled. In other words, the Aztecs were familiar with many of the basics of chocolate manufacture. It is thought that early Spanish missionaries to the New World in Mexico had a flourishing side business creating solid chocolate sweets and selling them.

Xocolatl was for the elite of Aztec society. It was preferred over the other exotic drink, *octli*, which was a sort of wine. Intoxication was frowned upon in their culture, so xocolatl gained prominence among the military, religious, and merchant classes. It was drunk primarily by the royals, lords and nobility, the elite warriors, and important merchants. The drink was customarily served from fine gourds at the end of a meal, with the smoking of tobacco. The only commoners who received it as a matter of course were soldiers on the march. Ordinary people did not drink it, except perhaps for those who lived near the cacao trees.

An historian of Cortés's time, Diaz del Castillo, makes reference to xocolatl's aphrodisiacal properties (a report that in no small part would account for its ready acceptance in Europe). It is not known whether the Aztecs prized it for that, but it was known as a stimulant and as a carrier of medicines.

The beans were also used as a form of currency. A rabbit cost ten beans, and the services of a courtesan could be purchased for twelve. One bean would buy you a tomato or a tamale. One hundred beans purchased a slave. Tribes conquered by the Aztecs had to pay tribute in beans. The Spanish were surprised to discover that the Aztecs prized the beans over gold.

The peoples of South America were cultivating cacao for some 1,000 years before the arrival of the Europeans. It was an important facet of their religious rituals and social fabric. But the Aztec culture, like its predecessors, was fated to decline.

IN THE TIME OF CORTÉS

In 1502, Christopher Columbus, on his fourth voyage to the New World, came to the island of Guanaja, 30 miles north of what is now Honduras. He and his men encountered natives piloting one of the distinctive, 25-man “canoes.” Onboard, native nobles were resplendent in their elaborate, feathered headdresses. The boats were tied off, and there were trades offered. During the encounter, some cacao beans spilled and the natives gathered them up with great eagerness and care. The Europeans noted how closely the natives prized these “almonds” (according to an account by Columbus’s son, Ferdinand); they traded for some. Columbus himself apparently never tasted chocolate. He was the first to bring cacao beans back to Europe (1504), which he offered as an example of New World currency.

In 1519, Hernán Cortés of Spain led a fleet of 11 vessels to the coast of Tabasco, west of the Yucatán peninsula. With him was an army of some 700 men, armored, carrying cannon and primitive firing weapons called harquebuses. They began to march inland; many contingents of Aztec nobles dispatched by Montezuma met them, among them Montezuma’s brother, Atauci. From the nature of the gifts offered him and the lavish dress of the nobles, Cortés correctly guessed the riches of this country and resolved to march to its capital, Tenochtitlán. He ordered his ships to be burned to prevent desertions and set off for the capital. There were some minor skirmishes with Aztecs along the way, but once he reached the capital, he was greeted warmly by Montezuma.

Montezuma declared to Cortés and his own people that the Spaniard was “home in his native country.” Historians have often wondered why he offered this warm greeting to these aggressors. The answer may lie in the legend of Quetzalcoatl’s return.

It so happened that 1519 was a *Ce-acatl* year, the year that legends indicated Quetzalcoatl would return. Emperor Montezuma received word of a house on the water (such unimaginably large ships must have impressed him as the serpent-god’s promised palace). Further reports were that the people on it shone like treasure (armor) and had plumes like the serpent (plumed helmets). Not only did Montezuma bid Cortés welcome, but he is quoted by reliable historians as offering to return Quetzalcoatl’s kingdom to him. This may be why the Aztecs offered no resistance when the Spanish plundered the Aztec palaces and treasure hordes without respite.

All was at Cortés’s disposal; this included the fruits of a cacao plantation. Cortés immediately recognized the value the Aztecs placed on the bean; he and his nobles closely observed the cultivation of the plant and the making of the brew. Cortés sent ships laden with New World treasure in 1519 and again, in 1528. He sent novelties like bouncing rubber balls, jaguars, armadillos, actual Indian nobles, gold, and trinkets. It was on the second shipment that he sent cacao beans to Europe as an element of a recipe, which he also provided. “A cup of this precious beverage permits a man to walk an entire day without food,” he wrote to the court.

King Charles V of Spain and his queen enjoyed the beverage, and members of the court felt obliged to also enjoy it, though privately they confessed they didn’t like it much. History records that an adventurous duchess determined to improve its flavor. She added sugar, and soon this sweeter and smoother beverage soared in popularity at court. Nobles drank it from silver goblets, and ladies-

in-waiting competed to see who could further improve the drink's flavor with more spices. Mace and cinnamon are among the spices tried, often in stomach-churning abundance. At times it was served hot.

CHOCOLATE CONQUERS THE WORLD

In 1585, the first official shipment of cacao beans from Veracruz arrived in Seville. The court entrusted the secret of chocolate-making to monks, who managed to keep the recipe secret for nearly a century. In the meantime, Aztec civilization collapsed; this was not due to its own corruption or the superiority (militarily, culturally) of the Europeans, but primarily through alliances of enemies in city-states all around, and through the epidemics of smallpox and measles that the Europeans brought with them.

The Spanish conquistadores settled in for a long stay among the Indians. They did not like the chocolate drink at first; in fact, they rejected all New World foods and crops. But it was offered so often by the Indians that the Europeans gradually began to accept it, particularly the Spanish women. The colonists learned to press the "flour" into the form of a tablet, which could easily be transported and immersed in water. They learned to separate the cocoa butter and use it as a cosmetic, mimicking the Aztec priests, who, on high ceremonies, smeared the chocolate paste on their faces. They occasionally served the chocolate drink hot; this was probably due to the surging popularity of coffee and tea, which was being imported from China and Arabia at the same time. The Spanish are credited with introducing the *molinillo*, a special jug for preparing chocolate. The dried paste or loaf was placed with hot water in a special jug; on the jug was a lid with a hole to accommodate a stick that was spun to beat the chocolate.

But most crucially, in the 1600s the colonists added sugar to the chocolate; so successful was this that the Spanish planted sugar cane in Mexico and what is now Haiti. In this way, chocolate use spread throughout the colonies of the West Indies. Drinking chocolate became an important morning custom; in time *chocolaterías*—appointed public places for the drinking of chocolate—came into being. The Spanish also experimented with flavorings, such as aniseed, cinnamon, almonds, and hazelnuts.

By the early 1600s, chocolate had become so popular among the colonial Spanish, particularly the women, that it sparked a religious controversy. In the village of Chiapa, where

The Poisoner's Guide to Chocolate

"Beware the Chocolate of Chiapa." The unfortunate bishop of Mexican legend was not the first or last to (allegedly) experience death by chocolate. Because of its full flavor, rich texture, and the variety of spices that can be used in it, chocolate has historically been a favorite disguiser of poisons.

In Italy in the eighteenth century, chocolate was the favorite carrier of poisons among the clergy. It was rumored to be the vessel by which Pope Clement XIV was poisoned in 1774, and it was very popular in the 1600s Spanish court of the Hapsburgs for the same reason. It is recorded that Mme D'Aulnoy, a Spanish lady, got revenge on a lover who had spurned her by poisoning his cup of chocolate. When the poison began to take effect, and the man realized he was doomed, it is said that he took the time to advise Madame that next time she might add more sugar to eliminate the bitterness of the poison. With that gallant gesture, he died.

villagers were predominately Catholic, the women complained that they could not endure the kneeling and standing of an interminable high mass without some hot chocolate and sweet meats; chocolate was already perceived to have medicinal properties. The bishop, seeing servants rush in and out of church with chocolate for their ladies during services, forbade them to do so. The women defied him. The bishop called in soldiers to enforce his rule, but townsfolk armed themselves as well, and eventually the bishop relented. But shortly after the incident, he died, and it was rumored he was poisoned by the chocolate-drinking women. (It sparked a phrase that resonates to this day: “Beware the chocolate of Chiapa.”)

The story, though true, is deceptive: the members of the clergy were never against chocolate, as they were against tobacco, which was newly discovered and distributed at that time. The bishop of the story, in fact, loved chocolate, which is the reason it is suspected as the vessel of his doom. He simply didn’t want it at services.

The story points to the reason that monks, nuns, and priests of the time loved chocolate: it helped fortify them through fasts. This chocolate devotion led to a widespread debate about whether chocolate was a food or not. Most held that it was not, that it was more of a medicine, and that to use it during a fast was acceptable. The controversy would last for more than two centuries. The issue was clouded by the fact that some religious orders were actively involved in the cacao trade.

The Spanish brought the beans to Trinidad, and tried to keep the cultivation procedure a secret because the sweetened drink was gaining popularity in Europe. They kept the secret for 100 years, but eventually the beans were cultivated across the West Indies, the Philippines, South America, and Africa. For the greater part of the seventeenth century, Madrid had been the center of the chocolate world. All cacao flowed from Spain and its colonies. The decline of Spain as a world power coincided with this escape of the secret of chocolate.

Chocolate followed the conventional trade routes of the time. From Spain, it was first known in Portugal. It may have reached Italy as early as 1606, when it was imported by an Italian merchant who had enjoyed it in Spain. It was an instant hit and spread quickly throughout the country, partially because it was a time of ferocious warfare of city-states, and there was busy traffic from court to court. Italian *cioccolatieri* were soon exporting their product to other countries.

The French referred to Spain in a contemptuous manner as “the country without forks,” but the French embraced this product of Spain as quickly as other countries. In 1660, Infanta María Teresa of Spain married Louis XIV, King of France. The Infanta’s personal maid was nicknamed La Molina; it was a critical part of her job to prepare chocolate for her mistress. Historians record that the queen drank six or seven cups of chocolate a day. Within ten years chocolate was popular at Versailles and among aristocrats and the intelligentsia. Marie Antoinette, doomed wife of Louis XVI, employed her own personal chocolatier, who made her preferred mix of chocolate with orange flower water and orchid powder.

The drink soon spread to Holland and neighboring countries. By the 1650s, chocolate caught on in England. From England it traveled to the colonies in North America. In these countries, it was

still very much a seventeenth-century luxury item, out of reach of all but the aristocracy. Part of its popularity stemmed from its reputation as a medicine. Scientists of the time analyzed chocolate and attributed all sorts of benefits to it, particularly as a stimulant and for its digestive benefits. It was also said to be good for the breath and voice, a curative for hypochondria and consumption, and as an aphrodisiac.

THE DRINKS OF KINGS

By a quirk of culinary history, Europeans were discovering coffee and tea at the same time as chocolate. Tea was the most expensive beverage of the three, and the most prized. Coffee was the least expensive.

For the most part, chocolate was now offered in paste form, available in quarter-, half- or full-pound quantities. The paste typically consisted of cocoa, vanilla, cloves, cinnamon, and sugar. A typical recipe for a single serving of chocolate at the time called for four ounces of chocolate paste, four cups of boiling water, and four ounces of crushed sugar. When the water boiled, the chocolate and additional sugar were poured in and stirred well. The pot was removed from the heat before it boiled over, and the mixture was beaten with a stick until it frothed. It was then poured into a cup and served.

Hot chocolate was generally drunk in the mornings and during receptions. Tea was the beverage of choice in the afternoon, while coffee was reserved for after meals. The man of the house also might take an hour from work, at around four or five o'clock, to go home and have a cup of chocolate. By and large, chocolate was considered to be the ultimate feminine drink. It was the custom among royalty, nobles, and the leisure class for the lady to take chocolate in bed, upon rising. In general, men preferred coffee.

Chocolate at this time was served in chocolate pots and apportioned in chocolate cups. There is dispute as to whether the French or Spanish invented the *chocolatière*, or chocolate pot. This is a reworking of the molinillo introduced by Spanish colonists. The chocolate pot is a vessel wider at the base than at the top, with a spout and a horizontal wooden handle for serving. In the lid is a hole for the whisk, which stirred the chocolate. Sometimes the pot was mounted on a stand and heated from underneath. Chocolate pots were made of ceramic, tin, copper, or pewter. The pots of the nobles and royalty were fashioned of silver, porcelain, and even gold, with matching sets of cups and saucers. The chocolate pots of the rich and royal were elegantly appointed, and designed to confirm the drink's erotic, sensuous qualities. The wildly baroque Austrian pieces are the most extreme. The most elaborate chocolatière ever fashioned was said to belong to Madame de Pompadour, of the court of Louis XV.

The early eighteenth century saw a very gradual transformation, as chocolate consumption, once reserved for the rich and royal, began to be enjoyed by commoners. Smuggling cacao beans became unnecessary as taxes, particularly in England, fell. Prices fell with it, and the drink that had been perceived first as a medicine, then as a delicacy, began to be enjoyed by all. And the popularity of these consummately social beverages—coffee, tea, and chocolate—gave birth to the coffee and chocolate houses. As rivals, these houses became important centers of social and political life.

Is Chocolate an Aphrodisiac?

Everyone knows that Montezuma consumed 50 goblets of chocolate a day, much of it before entering his harem; the drink was intended to bolster his stamina and desire. The problem is that this story is probably not true; there is no evidence that the Aztecs actually considered chocolate an aphrodisiac. It was sacred, yes, and medicinal, yes, but any talk of aphrodisiacal properties was probably the result of feverish Spanish imagination.

Still, chocolate's reputation in this area followed it to Europe. It positively flourished in the courts of the French kings of the eighteenth century. The art and literature of the time are thick with erotic imagery in connection with chocolate, partially propelled by the of the Marquis de Sade, who mixed the erotic qualities of chocolate with its ability to disguise poisons. Casanova, too, used chocolate (and champagne) as a means of seduction.

In the court of Louis XV, Madame de Pompadour took her chocolate with ambergris to stimulate her desire for the king—it was said that she was cold to him. Madame du Barry was the opposite: she was reputed to be nymphomaniacal and encouraged her lovers to drink chocolate in order to keep up with her.

Chocolate's reputation as an aphrodisiac lasts to this very day. There have been persistent rumors that eating the green M&M's (only the greens) is an aphrodisiac, or at least will summon good luck in love. So pervasive was this story that a woman formed a company to sell only green candy-coated chocolates.

Part of this contemporary re-stimulation of the legend stems from a 1980 study by Columbia University. Researchers observed that a significant number of patients with depression who were hypersensitive to romantic rejection also craved chocolate. The researchers isolated phenylethylamine (PEA).

Phenylethylamine is a stimulant (found in small amounts in some foods, and also found in the brain) that raises blood pressure and heart rate. A miniscule amount of PEA is released by the brain at moments of emotional euphoria.

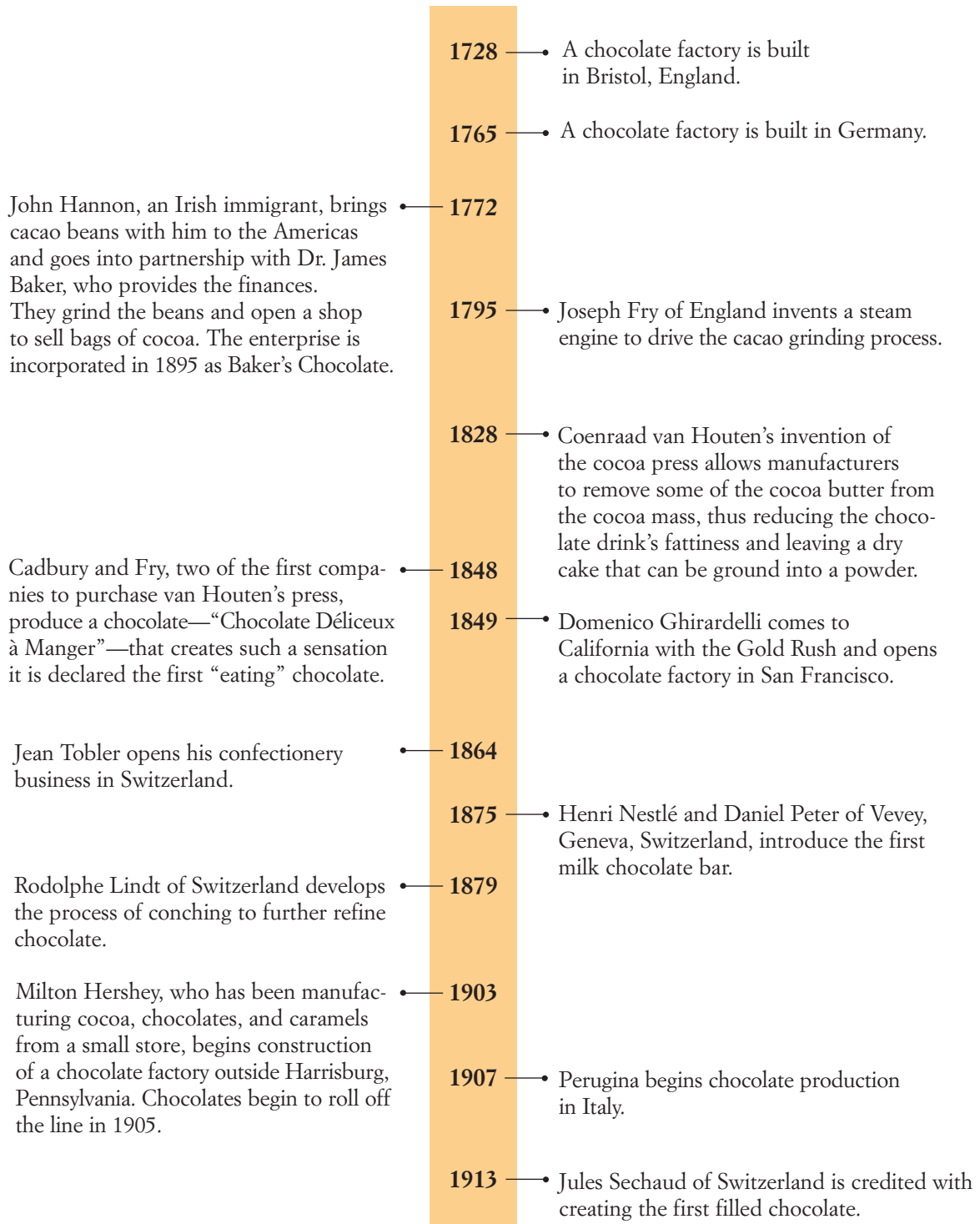
The Columbia researchers hypothesized that when a person consumes a food containing the substance, romantic feelings were enhanced or the euphoria of being in love was reproduced. (On further study, however, the researchers rejected these conclusions, particularly the chocolate link.)

The problem is that there is no evidence that dietary PEA increases PEA in the brain. PEA in food is quickly broken down by digestive enzymes in the body so that it does not reach the blood or the brain. Other intrepid scientists literally ate pounds of chocolate and then were measured for their PEA levels. There was no change.

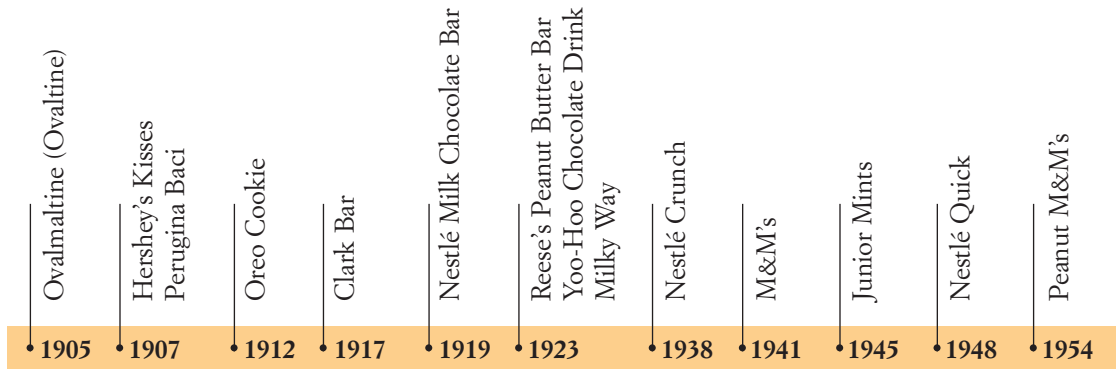
Perhaps they were eating the wrong food. Among the foods that contain more PEA than comparable servings of chocolate are cheddar cheese, salami, and pickled herring. A standard serving of smoked salami, for example, contains more than four times the PEA of your average chocolate bar.

History of Chocolate

The history of chocolate, anticipating the Industrial Revolution, began to take the form of giant, industrialist steps:



Dates of Birth



The first English chocolate house opened in 1657. Here, gentlemen would enter, slap a penny on the counter, peruse the newssheets, order a cup of chocolate (which was generally served hot), and sit and swap lies with their neighbors. Sherbets, savory dishes, cider and other drinks were served to patrons, who would spend hours disseminating rumors and news, as well as playing cards or dice. The most fashionable of these houses for hundreds of years was White's. In London and small towns all over England, the chocolate houses became critical to the lives of the people.

Sometime during the Baroque era in Europe (before 1750), solid chocolates took their place alongside other sweets on the banquet tables—candied fruits, sorbets, and sugar candies. Chocolate sticks were sold in English chocolate houses and by the early eighteenth century chocolate was available all over Europe in bars, tablets, and lozenges. It was also served as an ice, and there were drink recipes for chocolate with milk, with wine, and with egg yolk. Drinks were more often flavored with lemon peel and other citrus fruits, jasmine, almond paste, and flowers.

In 1753, the Swedish naturalist Carl von Linné (Linnaeus), who was the inventor of the binomial system of classification of living things, officially named the cacao tree *Theobroma* (from the Greek *theos*, meaning god, and *broma*, beverage, or “food of the gods”) *cacao* (the native term for “the chocolate tree”). It was as though he was conferring a blessing, or firing off a starter's gun.

It is interesting that most of the major inventions involving the manufacture of chocolate were made in the seventeenth and eighteenth centuries. The process has not changed all that much since these first giant steps were taken. And the cultivation and harvesting of cacao has not changed appreciably since the Aztecs.

How Chocolate Is Made

People often ask us: What is the best chocolate? The answer is both subjective and complex. A better question would be: Why is one chocolate better than another? What contributes to quality in a chocolate? There are crucial points in the cultivation and manufacturing processes that can contribute to, or detract from, quality.

CULTIVATION

Chocolate is the product of the cacao bean. The beans are found in pods that grow on trees that thrive only in geographical areas within 20 degrees (roughly 600 miles) north and south of the equator. Only in these regions are there the necessary stable climate of heat (temperatures that never fall below 68°F), humidity, rainfall (between 70 and 90 inches a year), damp soil, and heavy shade the trees require. The smaller cacao trees have slender trunks, with dark green leaves and yellow flowers. In the wild, the flowers, which spring from the bark, are pollinated by midges; on plantations, workers sometimes pollinate them with brushes. Successfully pollinated flowers bear fruit directly on the trunk or on the largest branches. The fruit becomes *cherelles*—long oval green pods much like small footballs, which grow to between six and fourteen inches. Cacao pods are either rounded or pointed at the end, smooth or ridged. Within each is a viscous, pink-white pulp called mucilage, and sitting in the pulp are perhaps fifty almond-sized, pale cacao beans.

Mature trees produce some 6,500 flowers per year, of which only 60 to 120 will become pods. Pods contain 20 to 40 seeds, or cacao beans. On average, a tree yields one to two pounds of dried beans a year (the beans lose half their weight during drying).

There are two basic types of cacao bean, and a third that is a hybrid. The finished chocolate that we enjoy is most often the product of a blend of the following three.

Criollo is a thin-skinned, very aromatic bean with a slightly bitter, yet complex and delicate flavor. The tree is relatively rare and fragile, requiring meticulous care in cultivation. Thus, yields are low—criollos represent only ten percent of the world's crop. Criollos bring balance, acidity, and complexity to fine chocolates. The bean is mainly cultivated in Central and South American countries where cacao originated—Venezuela, Mexico, Nicaragua, Guatemala, and Colombia, plus Trinidad, Grenada, and Jamaica.

Forastero has been thought of as a somewhat one-dimensional bean, lacking in flavor and aroma, requiring relatively intense roasting to bring out its qualities. In recent years, however, cross-breeding has yielded more flavorful forasteros. In most chocolate blends, forasteros give body to the finished chocolate. They are principally grown in African countries, but also in Brazil, the West Indies, Central

Name That Candy Bar!

*A*ctual names of candy bars and confections of America's past:

B'Gosh	Alabama Hot Cakes	18th Amendment
Tingle Bar	Idaho Spud	Roasty Toasty
Bool-a Bool-a	Snirkles	Prom Queen
Yacki-Hula	Big Eats	Playboy Bunny Chocolate
Eatmor	It's Spiffy	Abba-Zaba
That's Mine!	Heavenly Hash	Hot-Air
But-a-Kiss	Jolly Papa	Big Hunk
Chicken Bone	Reggie Bar	Baffle Bar

—Thanks to Ray Broekel

America, and, increasingly, other countries in South America. This bean represents some 85 percent of the world's production of cocoa beans. It is the mainstay of cocoa bean blends.

The third bean, trinitario, is a hardy cross-breed of forastero and criollo. It represents 10 to 15 percent of the world harvest, and contains a high cocoa butter content. Trinitarios are primarily found in Sri Lanka, Central and South America, and Indonesia, but the highest quality are found on Trinidad, their country of origin and namesake.

Many of the characteristics of these beans depend on their country of origin. Brazilian beans are said to be slightly smoky but robust, Guyaquil beans are sweet, Sumatra beans are acidic, and Indian Ocean cacaos are pungent and sourish but not bitter. Madagascar cacaos are strong in flavor and aroma. Venezuelan cacaos, primarily criollos, are considered by many chocolatiers to be the finest. But these terms can be deceiving; since chocolates are the result of a blend of cocoa beans, a slightly acrid bean, such as the variety grown in Trinidad, might be an excellent element in a certain blend.

Cacao in a Nutshell: A Summary of the Chocolate Industry

Chocolate manufacture is a four-tier process. The first tier is the **plantation** where the cacao is grown; cacao beans are cultivated in countries within 20 degrees of the equator. The beans are then acquired by companies primarily in Europe and the United States; this is the second tier—the **plant** where the cacao beans are converted into chocolate. (There are only about ten chocolate manufacturing plants in the United States.) These companies process the beans into chocolate, primarily in the form of 5 and 10 pound tempered bars or pastilles (large chips). These bars and chips are sold in bulk to the third-tier **companies** that make a product with it, often called candy. (There are approximately 760 such companies in the United States.) Candy in the chocolate world is a technical term; it means the confections made by the third-tier producer from chocolate made by a second-tier manufacturer. These third-tier companies generally sell chocolate products to the fourth-tier **shops**, who sell directly to the consumer.

FERMENTATION

The growing season of cacao pods is continuous. The trees are too delicate to be climbed or shaken, so the fruit is cut down by hand, with long-handled knives. The pods are split open with machetes, then the pulp and the beans are scooped out and placed on banana leaves on the ground, and covered with more leaves. Different plantations in different countries vary in the way they place beans for fermentation; in addition to banana leaves, beans can be placed in baskets, buried in pits, or arranged on trays or in crates, but the final step of covering them is universal.

It is the sugar content of the pulpy flesh that ignites fermentation. The pulp turns into acetic acid, which ferments the cocoa (formerly cacao) beans before it evaporates. The seed's embryo is destroyed, preventing germination, but in the process it generates the chemical precursors to the bean's chocolaty aroma. In general, quality beans undergo more rapid fermentation. Criollos need some two days; forasteros and trinitarios take a week or more. But the timing is crucial; the beans must not be allowed to ferment too long, or to be pulled from the pulp too quickly, or the maximum flavor from a cocoa bean will not be evoked.

The seeds, which were bitter, are now sweet, and they have changed color; criollos turn yellow-brown, and forasteros are darker, almost violet.

The fermented beans are next spread out in single layers on raised mats, sometimes in enclosures, and are left out in the open air to dry. Portable roofs may be rolled over the beans to stabilize the conditions. In some areas, the beans are dried in ovens to facilitate the process, but this often results in tainted, malodorous beans. These smoky beans, even in small numbers, can ruin a batch of chocolate, and such beans will not be purchased by quality manufacturers.

Once dried, the beans are packed in 110-pound sacks for inspection and shipment.

INSPECTION, TRADING, AND PURCHASE

Government inspectors visit the plantation and take a large sample from the sacks. They split the beans lengthwise and classify them by grades. Fine grade, second grade, and third grade are determined by the color of the beans. More inspections take place at the plantation, at the port of departure, and before loading.

Generally, cocoa beans are not processed into chocolate in their country of origin, but rather are shipped to Europe and the United States. There are a few manufacturing companies in Venezuela, Brazil, the Ivory Coast, and other countries, but these are exceptions. In general, cocoa beans are purchased in the country of origin by private import-export traders or international brokerages or exchanges; these might purchase all or part of the country's production. These beans are then sold to negotiators, who supply various chocolate manufacturers.

We have seen how the type of bean and the correct fermentation are important indicators of quality. Now it is up to the chocolate manufacturing companies to discern not just quality beans, but beans of various characteristics (and prices) that they believe, once blended, will give them a desirable, and profitable, final product. A few globe-trotting buyers from elite chocolate companies will inspect the growing and harvesting conditions at plantations, and even offer advice on cultivation; they purchase beans at the plantation. These exclusive chocolate companies source the best beans on the best plantations. They then use the best production methods. In general, chocolate companies get what they pay for. Brands of chocolate differ because companies have different budgets for purchasing beans. And as we will see, they also have distinct approaches (and varying budgets) to blending, roasting, grinding, flavoring, and conching.

BLENDING

At the chocolate factory, the beans are checked (for impurities), sorted (for size, toward uniform roasting), and often cleaned of any incidental impurities, such as earth or pests. Now the beans are turned over to the chocolatiers.

The chocolatiers—as few as 1, as many as 20—evaluate the imported beans. At Valrhona, for example, some 20 criteria have been established, including acidity, bitterness, and a spectrum of flavor “notes”—terms like “head notes” (the first flavor) and “heart notes” (the undertones) and the after-

taste, or lingering flavor. Having evaluated the beans, the chocolatiers create various blends. A chocolate is generally the result of a blend of four to seven different bean batches. In creating a blend, the chocolatiers attempt to balance the strength of certain beans with the aromas or acids of others. Chocolatiers generally adjust blends, roasting times, and other factors to create a final product that is consistent with the products made up to that point.

After the beans are analyzed, but before they are physically blended together, each batch of beans to be used in a particular blend is roasted separately.

ROASTING

Qualities the master roaster must take into consideration include a cocoa bean's type, fermentation state, geographical origin, and moisture level. Poor-quality beans are roasted at higher temperatures (as high as 266°F) in an attempt to maximize their few good qualities and conceal their shortcomings. The lower range of temperature, for finer cocoa beans, is in increments below 248°F. Beans may be roasted in the shell, or after the shell has been removed.

Roasting takes anywhere from 10 to 35 minutes. The first phase is little more than a drying; the water content of the beans is reduced to 3 percent and the shells become loosened from the kernel. Afterwards, the actual flavor development begins. Although the roasting process is, by and large, dominated by high-tech, precision equipment with computerized controls and measuring instruments, the best guides remain sight and smell. A bean roasted to perfection has purplish highlights and a strong cocoa aroma. Certain types of cocoa beans are preferred for the manufacture of certain chocolates, of course. For fine milk chocolate, Java beans are chosen for their natural caramel flavor, which blends perfectly with milk. Cocoa beans intended for a milk chocolate recipe are generally roasted lightly.

Next, the beans are winnowed; the now-brittle beans are cracked open and subjected to jets of air to remove their skins. What remains is called the nib. Now, as a nib, it is sent to be blended in the company's "house formula(s)."

THE RECIPE

At this point, the manufacture of cocoa and chocolate diverge. In one process, the ground nibs are hydraulically pressed. The cocoa butter melts, separating from a cocoa powder "cake," which contains some traces of cocoa butter (10 to 20 percent). The cake is pulverized and sifted into cocoa powder.

The separated cocoa butter is eventually reintroduced into the manufacture of chocolate, or is molded into bars and sold separately. (Among the buyers is the cosmetics industry, because cocoa butter's body-temperature melting point makes it ideal as a base for lipsticks and creams.)

Meanwhile, the nibs destined for a chocolate recipe are pulverized in giant rollers. The paste that results is called cocoa mass, or chocolate liquor. This paste is placed in a mixer with precise formulas of sugar, cocoa butter, vanilla (or vanillin), lecithin, and milk products, if they are called for. Obviously, the quality of these additional ingredients and the proportions are crucial to the quality of

the finished chocolate. How much cocoa mass remains in the finished product? How much sugar is added? Too much sugar or too little can make all the difference. The aims and budget of the manufacturer come into question here, because sugar costs somewhere between a fifth or a quarter of cocoa beans, and is about a tenth as expensive as pure cocoa butter. Some manufacturers try to disguise inferior beans with overdoses of sugar in order to maximize profits. Likewise, vanilla. Do they use real vanilla, or vanillin? How much cocoa butter is used? Are other fats used, in whole or in part?

Lecithin is a soybean by-product, used here as an emulsifier and stabilizer. It improves the texture and storage qualities of the chocolate, and is part of the formula of virtually all chocolates.

The chocolate mix is still pasty at this point. Now it is refined: the mixer pulverizes it or passes it through refining rollers.

CONCHING

The refined chocolate is then poured into huge vats and subjected to a rolling process called conching; the early paddles resembled conch shells, thus the name. The late stage of conching is a splendid sight, like something out of a chocolate lover's fever dream: huge paddles rolling slowly through great vats of chocolate, smooth and creamy and thick.

Conching develops flavor, eliminating any remaining bitterness by aerating the chocolate and expelling volatile acids; it gives the chocolate a smooth texture by encouraging cocoa butter to coat the sugar and cocoa particles, which reduces grittiness. The paddling is continuous for a period of time. Swiss and Belgian chocolates, known for their smoothness, are conched as much as 96 hours. Some chocolates are not conched at all, or for only 4 to 12 hours. There is an upper limit to conching, however; because contemporary technology allows the chocolate particles to be ground extremely fine, conching times can be reduced.

After conching, the chocolate is tempered; the molecular structure is changed as it is heated, cooled, and heated again. Tempering gives the chocolate a good sheen, smooth texture, and ensures that it will keep well.

Finally, the chocolate is run on conveyor belts through cooling tunnels and molded into blocks (for chocolate companies to use to manufacture chocolate, or for restaurant pastry chefs), pastilles (which are like coins, and also used by manufacturers and restaurateurs), or bars (for smaller manufacturers' use, and sometimes for the consumer). Some companies make their own candy on site, but for the most part, the blocks and bars are wrapped, then stored for shipment.

Chocolate at Home

RECOGNIZING QUALITY

When the container or wrapper is removed, a chocolate should emit a good chocolaty aroma. There should be no hint of chemicals, cloying sweetness or a dusty quality, which indicates poor storage or age. The chocolate should have a smooth, glossy surface. Waxiness, grittiness, or greasy surfaces can indicate inferior ingredients or manufacture.

Color can run the spectrum from the deepest, darkest brown to auburn; many fine chocolates display mahogany highlights. If your white chocolate is white, beware; a quality white chocolate is deep yellow, indicative of high cocoa butter content. A quality chocolate will be smooth and glossy and free of bloom; bloom is caused by a separation of cocoa butter crystals and shows as white splotches. Proper cocoa butter content will determine many of the features of a quality chocolate: it will begin to melt in your hand or between your fingers within a few seconds. If it is a quality chocolate in bar form, it will make a distinct snap when it is broken; the break will be crisp and distinct.

To properly taste chocolate, a small amount should be placed on the tongue and left to melt. It should melt uniformly. The first sensation you should have should not be overwhelming sweetness; flavor notes should sound (as those hundreds of compounds begin to play on the tongue) and there will be a feeling of warmth, as your body heat and the chocolate synergize. There should be no grittiness to the chocolate; that indicates too much sugar was used. There should not be a waxy or greasy texture. It should be balanced between sweet and bitter. The vanilla should be subtle, not striking, and not artificial tasting. The chocolate should have a good, long finish, which is wine-speak for a pleasant aftertaste. There should be no chemical aftertaste.

Quality chocolates do evidence “notes,” just as a wine does, and it is fun to refine the palate and reconfigure one’s thinking to recognize chocolate notes. Dark chocolate is the Mozart of chocolates, producing a greater number of notes. Among common notes of chocolate you may be able to distinguish are fruitiness, nuttiness, and highlights of vanilla or caramel. Nuances of chocolate flavor are often compared to flower blossoms, to states of nature as in smoke or earth scents, and teas. Good white chocolate should be rich, mellow, not too sweet, and not dominated by vanilla flavorings.

When analyzing the texture of a pure chocolate, you want to find smooth, velvety, creamy. You want to avoid gummy, lumpy, sticky, crumbly, greasy, powdery, sandy, coarse, and waxy.

When enjoying filled chocolates, connoisseurs look for the coating to be thin, and the filling in harmony with, not fighting, the chocolate’s flavor.

Did we use the word “connoisseurs?” Ouch. We would hate for this little discussion of flavor notes to turn a simple chocolate lover into one of those insufferable wine people, who bludgeon everyone at a table with their knowledge and narrow proclivities. Chocolate will always be fun, first and foremost. Americans often take a beating for their love of milk chocolate; it is said that truly sophisticated chocolate lovers—like your average European—prefer dark. Yes: Dark chocolate is more

More Descriptive Terms for Chocolate

- Other positive terms for chocolate flavor include fudgy, fresh, buttery, rich, intense, clean, consistent.
- To describe poor-quality chocolates, words like thin, artificial, medicinal, bitter, odd, soapy, harsh, over-sweet, and watery can apply. The list goes on: sour milk, cheesy, dusty, smoky, musty, chalky, harsh, sour, flat, perfumy, metallic, rubbery, fishy, burnt, and cardboard-like.

nuanced, flavorful and has more character than milk, but milk chocolate offers a buttery smooth, silky, and wonderfully chocolaty experience. And statistics indicate that milk chocolate is a slight favorite over dark for candy consumption in every country except France. The best chocolate is your favorite chocolate, n'est-ce pas?

IS THE BEST THE BEST FOR EVERY OCCASION?

Judging a chocolate for its usefulness in baking and candy-making is a tricky issue. Often, the chocolate that tastes best is not the one that will work best in a recipe. There are subtle differences between chocolates, but such differences are often lost when you blend in quarts of cream or add nuts and zests. Valrhona, for example, is generally considered to be the number one choice for use by professionals when chocolate is the star of the dessert, and for candy-making. Professionals generally value Valrhona for its consistency, smooth texture, and ease of use—quality chocolates with high cocoa butter content are easier to re-temper. And yet Valrhona consistently ranks quite low in simple taste tests when sampled beside less expensive, domestic brands.

In a series for *Cook's Illustrated* magazine, as well as tastings in the *Chocolate Report* (a 1993 supplement to the *Cookbook Review*), milk and dark chocolates and cocoa were tested, and often the results were inconclusive. A chocolate might taste great when sampled by itself but lose flavor when melted or combined with other ingredients. Or it might take on undesirable qualities when joined with certain liquid or solid ingredients.

In general, high-quality chocolates are crucial for candy-making, less crucial in baking. To the extent that this matters to you or your budget, the best solution is to work with one chocolate, and get to know its characteristics: the way it behaves when it is melted, how it reacts to the addition of other ingredients, how its flavor melds with other ingredients, and whether it is consistent from purchase to purchase. In general, the quality chocolates are easier (less frustrating and time-consuming) to work with, with more predictable results; the extra money is well worth it. But that is not to say that quality resides only in imports, or more expensive chocolates; some chocolates react to, and flavor-coordinate better, with different types of contrasting ingredients—nuts, citrus, caramel, and so on. Experiment to find the right chocolate for your desserts, your temperament, your kitchen.

TERMS AND TYPES OF CHOCOLATE

The U.S. Standard of Identity, an arm of the FDA, has established certain requirements that chocolates must meet in order to earn the coveted titles of “white,” “dark,” “bittersweet,” and so on. It's all in the spirit of consumer protection, but sometimes it seems the government can squeeze the fun out of any subject, chocolate included. We will note these requirements when applicable.

CHOCOLATE LIQUOR is composed of cocoa solids and cocoa butter—in other words, pulverized cocoa beans minus the shells and impurities. The cocoa solids contain the flavor; the cocoa butter helps carry it. It is pure chocolate and is inedible. The word liquor is used in the sense of “essence”: it contains no alcohol.

COCOA BUTTER, the natural fat of the cocoa bean, helps carry the incomparable taste of the chocolate and is responsible for the mouthfeel. It is also responsible for the finicky and unpredictable nature of chocolate as an ingredient.

UNSWEETENED CHOCOLATE (sometimes called bitter, baking, or plain chocolate) is chocolate liquor. It contains between 50 and 58 percent cocoa butter and the rest pure cocoa solids (plus some flavorings such as vanilla, flavor extracts, salt), the percentages varying from brand to brand. It should not be confused with bittersweet chocolate.

COCOA POWDER is the result of a hydraulic press operation, in which virtually all of the cocoa butter is separated from pure chocolate liquor; the cake that results is ground into powder. There are several types of cocoa powder. Breakfast cocoa contains 22 percent cocoa butter, which is restored at the plant. Dutch-processed cocoa powder is alkalized; that is, an alkali such as potassium carbonate, is added to the powder during processing in order to neutralize the sour, astringent qualities of the cocoa beans. By also controlling color and flavor, this process creates a darker cocoa with less harshness. Non-alkalized cocoa powder is often lighter in color than alkalized and many brands may convey a more acidic and fruity chocolate flavor. Most European cocoas are alkalized. We do not recommend that you change the cocoa powder called for in a recipe. And, of course, instant cocoa mixes for drinks cannot be substituted for baking cocoa.

BITTERSWEET AND SEMISWEET CHOCOLATE must contain at least 35 percent chocolate liquor. The chocolates in this category are manufactured with such a variety of mixtures of added cocoa butter, sugar, lecithin, and vanilla, that their characteristics differ from brand to brand. If a recipe is tested with one brand, and you choose to use another, you can expect a difference in taste (particularly sweetness) or texture. In general, European companies label this chocolate as bittersweet or dark, while American companies refer to this chocolate as semisweet. There is no standard, technical distinctions between the two chocolates. In general, bittersweet chocolates will carry a stronger chocolate flavor.

EXTRA-BITTER CHOCOLATES (sometimes known as super-dark chocolates) are relatively new. These are chocolates with chocolate liquor content (aka cocoa content) of 53%, 66%, 77%, and more. They are generally available in bulk for professional chefs. A few are being marketed to the consumer in bar form. These chocolates will obviously pack a considerable chocolate wallop, but do not casually substitute them in recipes calling for semisweet or bittersweet chocolate.

MILK CHOCOLATE, American's favorite chocolate delivery system, must contain at least 10 percent chocolate liquor, plus a minimum of 3.7 percent milk fat and 12 percent milk solids. Manufacturers also add sugar, cocoa butter, lecithin, and vanilla or vanillin. European milk chocolates are generally made with condensed milk. American and British chocolates are most often made with a milk and sugar mixture. Milk chocolate is milder and sweeter than dark chocolate, and lacks its subtlety. A good milk chocolate strikes a balance between the milk and cocoa—the milk should not mask the chocolate flavor. It should melt on the mouth without a greasy feel. Because of the milk component, it is intolerant to heat, and is therefore difficult to cook and bake with.

WHITE CHOCOLATE is composed of differing amounts of cocoa butter, butterfat, sugar, milk solids, lecithin, and flavorings. Because this product contains no cocoa solids it is not labeled as “chocolate” in the United States because it does not meet the U.S. Standard of Identity’s criteria for “chocolate.” Instead, it is sold as “white confectionery bar” or “summer coating.” However, the FDA is expected to issue a new standard on white chocolate, determining that a product with a minimum of 20 percent cocoa butter can be labeled as white chocolate. This will be a useful ruling because now the consumer will have a clear way of distinguishing “real” white chocolate (contains cocoa butter) from the “coating” products (made with vegetable fat). Avoid the “coating” products when preparing the recipes in this book, or any other. Read the label to be sure the product you’re considering for purchase contains cocoa butter or observe the color of the product: white chocolate is ivory-colored while the vegetable-fat coating is bright white.

White chocolate morsels and chips contain less cocoa butter than any other form of white chocolate; white chocolate in general is very sensitive to heat, so be careful when melting it and storing it.

Cocoa butter has little effect on the chocolate flavor of white chocolate, though it does have an effect on the depth or impact of the flavor. Cocoa butter carries mild chocolate flavor, but also many residual flavors and odors from the earth and climate of its country of origin. Most cocoa butters, in fact, are deodorized as part of the manufacturing process; this is done because chocolates are a result of a blend of different cocoa beans; these blends would be confused with several odors and flavors if the cocoa butter were not deodorized. (One exception is El Rey. Because these chocolates are from a single source [Venezuelan criollos] they have no need to be deodorized.)

White chocolate can be a star in its own right, in desserts or as a treat. But it is most often employed as a back-note, or undertone, in desserts, used to support or contrast the main item in flavor and/or texture.

GIANDUJA (jon-DOO-yuh) is a blending of pulverized hazelnuts and milk chocolate.

GRAND CRU CHOCOLATES are produced from a single cocoa bean, rather than a blend.

SWEET CHOCOLATE is a blend of chocolate liquor (at least 15 percent) and varying proportions of sugar, cocoa butter, lecithin, and flavorings.

COUVERTURE is not a brand or a type of chocolate; there are dark, bittersweet, milk, and white couvertures. Couverture is a term that applies to professional-quality coating chocolate with a high percentage of cocoa butter—from 32 to 39 percent cocoa butter. This extra cocoa butter makes it easier to work with the chocolate in melted form, and it can be used to form a thinner, more delicate shell to enrobe fillings. Though the word ‘couverture’ translates as ‘coating,’ this is emphatically not to be confused with confectionery, compound, or summer coating.

CHOCOLATE MORSELS AND CHIPS are formulated especially to retain their shape when used in baking and other desserts—cocoa butter is partially or completely eliminated in favor of vegetable fat so that the chips can tolerate high heat without their flavor or texture being altered; they are the exception to the rules cited in the Melting Chocolate section about chocolate coming in contact with

direct heat. They cannot, however, be substituted in a recipe calling for a specific chocolate; semisweet chips will not melt, taste, firm up, or in any manner succeed the way properly chopped semisweet chocolate will if it is called for. A semisweet chocolate, chopped just so, cannot be substituted in a recipe calling for chips.

CONFECTIONERY COATINGS are mixtures of hard vegetable fat, sugar, and milk solids or cocoa powder. Even when made with cocoa, these cannot be labeled as chocolate. Because most confectionery coatings don't need tempering, they are commonly used in bakeries for glazing cakes, cookies, and pastries. Confectionery coatings include compound coatings and summer coatings and are not to be confused with white chocolate. Compound coatings include a small amount of milk solids and cocoa powder. Summer coatings contain milk solids and hard vegetable fat and are sometimes color-tinted.

CHOCOLATE PLASTIC is a mixture of a small amount of chocolate solids with either corn syrup, cottonseed oil, or palm kernel oil in place of cocoa butter. Dull of finish and bereft of chocolate's flavor and snap, chocolate plastic is nonetheless pliable enough to be used as a garnish for desserts—flowers, ribbons, wraps, and much more. It is also known as compound coating or summer coating because even at high temperatures it does not melt.

STORING CHOCOLATE

This section refers only to storing chocolate by itself, not chocolate desserts. Refer to individual recipes for how they can best be preserved.

Chocolate must be stored carefully because it absorbs odors and seems to act as a magnet for moisture. It should be wrapped first in plastic, then in heavy-duty aluminum foil, then (optional, but

Professional Chefs' Chocolate Preference

*W*e asked dozens of professional chefs to express their preferences for types of chocolate and their uses.

FOR MOUSSES and BUTTERCREAMS: baking chocolates (not couverture); their lower cocoa butter content contributes to a lightness in the finished product.

FOR MOLDING, coating, and shells in candy work: high-quality couvertures; their high cocoa butter content contributes fluidity, and their high cocoa solid content heightens

chocolate flavor.

FOR GLAZING: couverture, for its ease of handling.

FOR GANACHE: couverture is preferred for its high-impact chocolate flavor as well as its rich, smooth texture.

FOR SAUCES: unsweetened chocolate.

FOR CAKES: a quality chocolate with a high cocoa butter content will help the cakes retain moisture.

FOR FINE CHOCOLATE WORK and decorations: couverture provides strength and fluidity.

a good idea) placed in an airtight container. Ideally, the chocolate will be stored in a cool, dry place with good air circulation, a place with a consistent temperature of around 65°F, and relative humidity of 50 percent. Stored in this way, dark and unsweetened chocolate may keep for as long as several years. Milk chocolate will keep for one year and white chocolate for seven or eight months. Ten degrees warmer and a comparable increase in humidity will not alter this formula significantly, but conditions above that—or wildly inconsistent conditions—will affect the chocolate’s quality.

Few of us live in such ideal conditions, so the question becomes: Can chocolate be refrigerated? There is disagreement on this point among chocolatiers, but let’s get real: You would do anything to avoid wasting good chocolate, so our advice is to buy only as much as you’ll need for a given project, then store any leftover food of the gods as carefully as you can. If the refrigerator is needed, so be it.

Chocolate stored in the refrigerator should be stored in plastic, aluminum foil, and an airtight container; it must not absorb odors or moisture. You must wrap the chocolate with the minimum amount of air. Plastic bags and wrap allow you to force air out before sealing. When wrapped airtight, you can refrigerate or freeze it, extending its life. Baking or couverture chocolates should not be stored in the refrigerator or freezer for any length of time; the humidity may cause sugar bloom, affecting the flavor and texture of the chocolate. When it is time to use the chocolate, do not unwrap it until it thaws; otherwise, condensation may form. (We do not recommend that you freeze chocolate that will be thawed and used for candy-making. It would be better to make the candy first and then freeze.)

White chocolates must be stored away from light because of the milk solids. Light accelerates its oxidation, so that the chocolate can go rancid overnight. Store in a dark place with a dark covering.

Chocolate that is not stored or shipped properly will bloom. There are two kinds of bloom. Sugar bloom results when chocolate has been exposed to too much moisture; as the moisture that has gathered on the surface evaporates, sugar crystals come to the surface, making the surface rough and pitted. The second type, fat bloom, results when chocolate has been exposed to warmer-than-acceptable temperatures; here, stable cocoa butter crystals melt, are destabilized, and then stabilize again, but this time as large crystals on the surface of the chocolate. You will see gray-white streaks and blotches. Chocolate that has bloomed can be re-tempered and used—sugar-bloomed chocolate can be used for cooking and baking, but not candy-making; fat-bloomed chocolate, after tempering, can be used for baking and candy work.

MELTING CHOCOLATE

Melting chocolate should be a simple procedure, but of course it isn’t. If you apply too much heat, the chocolate will scorch, lose flavor, and turn coarse and grainy. If there is a drop of moisture in the pan or too much moisture in the air, the dry particles suspended in the cocoa butter in your chocolate will clump together. In other words, your chocolate will seize—it will harden to a grainy, clotted, dull, thick paste and become unworkable; it cannot even be remelted. Add alcohol, and even vanilla, to chocolate during melting, and it can sometimes seize. Add a small amount of a cool liquid to the melted chocolate, and it will seize.

But enough about seizing, scorching, and so on. You can melt chocolate! Here's how:

First, know that chocolate cannot be melted over direct heat. Gentle indirect heat in a meticulously dry environment is required. Milk and white chocolates especially should be stirred often during melting.

Chocolate should be chopped into ½-inch pieces to maximize the melting surface. Use a serrated knife in a rocking motion. Some people prefer to chop their chocolate caveman-style: they cover the chocolate with cloth and go at it with a meat hammer.

To melt chocolate alone, make sure that no moisture comes in contact with it—the bowl must be perfectly dry, as must be the knife used to chop the chocolate, the cutting surface on which it will be chopped, and the spoon used to stir the melting chocolate. Dry, dry, and dry again.

Now select a method. Many people today tend to use the microwave oven in order to completely eliminate the moisture factor of the double boiler. Some people prefer a water bath over a double boiler for melting chocolate, because of the inflexibility—in terms of size—of double boiler components and because most do not allow you to see inside the pot to check the procedure. Again, if the water is kept below a simmer, moisture should not be a factor either way.

IN A MICROWAVE OVEN: Place the coarsely chopped chocolate in a microwave-safe glass container (such as Pyrex) and microwave it at medium (50 percent) power for 1½ to 4 minutes, until the chocolate turns shiny. (You must check often because the chocolate will retain its shape and look solid even though it has liquefied.) Stir milk and white chocolates after about 1½ minutes.

On average, 6 ounces of chopped semisweet chocolate will require 3 minutes to melt at medium power. The higher the cocoa butter content, the faster the chocolate will melt. And believe it or not, chocolate melts faster on medium or low microwave power than it does on high.

IN A DOUBLE BOILER: Place coarsely chopped chocolate in the top of the double boiler over hot (not simmering, not boiling) water. Melt the chocolate, stirring until smooth. Do not cover the bowl of chocolate while it is melting. You risk the possibility of condensation forming under the cover. When the chocolate is melted, remove the top part of the double boiler from the bottom.

- ↔ Always melt chocolate uncovered; moisture could condense on the lid, drop onto the chocolate, and cause it to seize.
- ↔ The bowl containing the chocolate should be either unlined copper (very responsive to temperature changes), stainless steel, or heatproof glass; enameled cast iron is not appropriate because it retains heat, which will overheat the chocolate.
- ↔ Make sure that the bowl is larger than the pot so no steam gets into the bowl. The chocolate container should come in contact with the water. If there is a space between the water and the container, the steam could scorch the chocolate.
- ↔ You might remove the chocolate from the heat before it is completely melted; it will continue to melt on its own. Rewarm it if necessary.

SPECIFICS OF MELTING DARK, MILK, AND WHITE CHOCOLATES: Chocolate should always be coarsely chopped into small chunks: ¼ inch for milk and white chocolate; dark chocolate chunks can be larger, if desired—but no more than ½-inch thick. Stir often. When in doubt, stir. Milk and white chocolates must be stirred frequently, if not continually, or the milk solids may form lumps. (This depends partially on the storage of the chocolate. Milk solids are very sensitive to heat and humidity.) Stir dark chocolate intermittently.

White and milk chocolates should not be heated above 110°F, and should be removed from the heat at 105°F. Dark chocolate should not be heated above 120°F. This may seem to be very hot, but it is considered warm. Remove dark chocolate from the heat when it reaches 115°F because the temperature will continue to rise to its maximum point.

MELTING CHOCOLATE AND LIQUIDS: In general, 2 ounces of chocolate can melt safely with 1 tablespoon of a liquid such as milk, cream, liquor, coffee—even water. Chocolate will seize if it comes in contact with small amounts of liquid. Follow the recipe and your good sense; again, cocoa butter content will help to determine this tolerance. (So don't try adding a splash of your favorite liqueur to melting chocolate; you're only hurting yourself.)

To melt chocolate with a liquid, combine the cut-up chocolate with the liquid (in the proper proportion), and then warm them together. If you add cold liquid to warm or warming chocolate, the liquid will harden the chocolate, and it will form gritty particles. (If you add melted chocolate to cold ingredients, the cocoa butter will harden, and all will be lost.)

Chocolate can be melted with milk or butter directly over low heat, but it must be stirred frequently and watched very carefully.

TEMPERING BASICS

The subject of tempering strikes terror into the hearts of amateur dessert-makers and chocolatiers everywhere. The message here is: relax. Chances are, you will never need to temper chocolate. If you are going to make some or even most of the desserts in this book—or any dessert/baking book—you will not need to temper. You do not need to temper the melted chocolate you will be using for cookie doughs, cake batters, buttercreams, frostings, mousses, custards, and ganaches. Even the chocolate for a glaze does not need to be tempered if the dessert is to be consumed soon after it is made.

If the Chocolate Seizes

*P*our 1 teaspoon of vegetable oil per ounce of chocolate into the pan and beat vigorously. Make sure the liquid is warm enough not to compound the problem; it should be the same temperature as the chocolate. This should revive the chocolate.

An alternative is to save the chocolate and store it for a use when liquid must be added to it. (Scrape the chocolate onto waxed paper, let it harden, and store it safely for later use when a recipe calls for it to be melted with butter or cream or liquor.)

Many people do choose to temper the chocolate to be used for curls, ribbons, and leaves. If you are planning to make the candies in this book, or if you plan to learn the discipline of candy-making—for molding and coating and dipping chocolate candies—you will need to temper chocolate. Professional chocolatiers and chefs temper because they want their chocolates and garnishes to look and taste as fabulous as they can be. Properly tempered chocolate is lustrously glossy in appearance, breaks with a pleasing snap, and melts properly on the tongue. Tempered chocolate shrinks slightly as it hardens, and thus will release from molds more easily. Tempered chocolate, if stored properly, will retain its snap and shine for months.

Tempering is the process of heating chocolate to between 110°F and 120°F (in order to melt out stable and unstable cocoa butter crystals) and then cooling it to between 82°F and 84°F (at which temperature-stable crystals can re-form, but unstable ones cannot). This “seeded” chocolate is then heated again to between 84°F and 91°F to give it a workable consistency, and maintained at that temperature while it is being used. The temperatures given here are generalized; specific temperatures apply to different chocolates. These specific temperatures may be included on a package of couverture and should be adhered to. In general, however, the following guidelines apply:

DARK, SEMISWEET, AND BITTERSWEET: 88°F to 91°F

MILK AND WHITE: 84°F to 87°F

All chocolates do not react the same way in the tempering process. And temperature and humidity changes in your kitchen will also drastically affect this process. Do not get cocky if it goes brilliantly the first time; chances are, it will be a time-consuming mess the next.

Remember that chocolates are tempered during the manufacturing process. The solid chocolate bars you buy, of whatever size, should be in proper temper when you purchase them, provided they were properly stored and shipped. They will, however, go out of temper once you melt them.

Also be aware that there are tempering machines on the market. But like any tool, it is best used after you have learned the technique behind it. A short list of tempering machine manufacturers can be found in the back of this book.

TEMPERING METHODS

To successfully temper, you will first need an instant-read thermometer, one with a gauge that runs from 80°F to 130°F in increments of one or two degrees. Fortunately, there are many fine, inexpensive digital thermometers on the market that will do the job. (Remember not to rest the thermometer on the side or bottom of the pan, but do submerge it at least 1 inch into the chocolate.)

There are several methods of tempering chocolate; we will highlight three—the microwave and direct methods, and a simple alternative. Our microwave method is a modified, updated version of the slab method, which has traditionally been the most frequently used tempering method. Our quick-tempering, direct method also involves the microwave.

MICROWAVE METHOD

1. Chop the chocolate into ¼-inch chunks. Put half of the chocolate in a 1½-quart microwave-safe bowl. (Use a 1-quart bowl when tempering 8 ounces of chocolate or less. When tempering more than 2 pounds of chocolate, use a large bowl.) Microwave uncovered on medium (50 percent) power for 1½ to 6 minutes, stirring every 1½ minutes, until the chocolate is completely melted and smooth (A). Stir in the remaining chocolate chunks (B).
2. Microwave uncovered on medium (50 percent) power for 1½ to 5 minutes, stirring every 60 seconds, until the chocolate is almost completely melted. Gently stir the chocolate and when it is completely melted, check the temperature. It should read between 110°F and 120°F (or the temperature recommended by the manufacturer). If necessary, put the chocolate back in the microwave set on low (10 percent) power for 5- to 10-second intervals, until it reaches the correct temperature. (Stir the chocolate for at least 1 minute before checking the temperature.)
3. Transfer the melted chocolate to another 1½-quart (or a smaller or larger bowl, depending on the amount of chocolate being tempered). This will bring the temperature of the chocolate down to approximately 100°F.
4. Wrap a heating pad (normally used for backaches) in plastic to protect it from chocolate stains. Set the control dial to the lowest setting (C).
5. Pour one-third of the melted chocolate onto a clean, dry work surface (such as marble or Formica). Keep the remaining chocolate in the bowl on the heating pad.
6. Using an offset metal cake spatula, spread the chocolate evenly across the work surface into a rectangle (D). Using a pastry scraper, bring the chocolate together, and as you do so, scrape the chocolate off the spatula. Continue this spreading and scraping process until the chocolate cools to 80°F to 82°F for milk and white chocolates and 82°F to 84°F for dark chocolate, loses its shine and forms a thick paste with a dull matte finish. Work quickly so that the chocolate does not lump. This process can take anywhere from 2 to 10 minutes, depending on the amount of chocolate, the type and brand of chocolate, as well as the temperature of the kitchen. The chocolate is now seeded. The professional term for this is “mush.”
7. Add the mush to the bowl of 100°F chocolate (E) and using a clean, dry rubber spatula, stir the chocolate gently until smooth. Be careful not to create air bubbles as you stir the chocolate.



8. Check the temperature of the chocolate. It should register between 86°F and 91°F depending on the type and brand of chocolate. (In general, dark chocolate should register between 86°F to 90°F, and milk and white chocolates should register between 86°F to 89°F.) If necessary, heat the bowl of chocolate in the microwave on low (10 percent) power for 5- to 10-second intervals, to raise the temperature the required number of degrees. (Stir the chocolate for at least 1 minute before checking the temperature. Be very careful not to overheat the chocolate.) The chocolate is now ready to work with. As you work, regularly stir the chocolate and check its temperature. Adjust the temperature and fluidity of the chocolate by turning the heating pad on and off. If for some reason the chocolate becomes too cold, simply reheat it in the microwave oven set on low (10 percent) power for 5- to 10-second intervals. (Stir the chocolate for at least 1 minute before rechecking the temperature.) Never let its temperature exceed 92°F, or the stable cocoa butter crystals will start to melt and the temper will be lost.

DIRECT METHOD (QUICK TEMPERING)

This method breaks the rules of the more traditional methods of manually tempering chocolate. Rather than stabilizing the cocoa butter crystals by melting and reforming the chocolate, this method calls for you to heat the chocolate very slowly just until it melts, and to maintain the chocolate's temperature at 91°F. In other words, even though the chocolate is melted, it is still in temper. It is important that the chocolate you use—preferably couverture chocolate—be in good temper when you open it; it should have even color and smooth grain, and show no evidence of streaking or blotching. You must watch the melting chocolate and monitor its temperature carefully. Always stir the chocolate for at least 1 minute before checking the temperature, as the residual heat in the melting chocolate and the glass bowl will cause the temperature to continue to climb even after the bowl of chocolate has been removed from the microwave.

This method is less messy and very fast, once you have become accustomed to the process. If you should accidentally overheat the chocolate during the melting process 1 or 2 degrees above 91°F, don't panic. Quickly transfer the melted chocolate to another microwave-safe glass bowl (this will help bring down the temperature), and add 1 more ounce of chopped chocolate. Stir gently until melted, then recheck the temperature.

1. Wrap a heating pad (normally used for back-aches) in plastic to protect it from chocolate stains. Set the control dial to the lowest setting.

The really simple but not so quick method

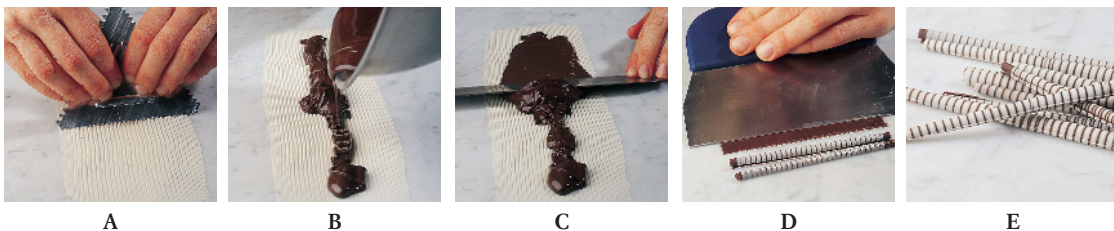
1. Melt the chocolate in a manner you are most comfortable with—but make sure that the chocolate reaches a temperature of between 115°F and 120°F.
2. Allow the chocolate to cool by itself (at cool room temperature), stirring occasionally, until it reaches a temperature in the low 80s. (Look for the chocolate to set around the top edge of the bowl.)
3. Raise the temperature of the chocolate to 86°F to 91°F (for dark chocolate) or 86°F to 90°F (for milk and white chocolate). Be careful not to allow the chocolate to go above those maximum temperatures. Maintain that temperature range while working with the chocolate.

2. Chop the chocolate into ¼-inch chunks and put it into a 1½-quart microwave-safe glass bowl. (Use a 1-quart bowl when tempering 12 ounces of chocolate or less. When tempering more than 2 pounds of chocolate, use a large bowl.) Microwave at medium (50 percent power) for 1½ to 5 minutes, stirring a couple of times with a clean, dry rubber spatula, until about one-third of the chopped chocolate has melted.
3. Remove the bowl from the microwave and gently stir the chocolate for 2 to 5 minutes, until it is almost completely melted. (This may seem like a long time, but the residual heat will continue to melt the chocolate.) Using a digital thermometer, with the stem of the thermometer immersed in at least 2 inches of melted chocolate (tilt the bowl if necessary), check the temperature of the chocolate. It should read between 86°F and 91°F depending on the type and brand of chocolate. (In general, dark chocolate should register between 86°F to 91°F, and milk and white chocolates should register between 86°F to 90°F.) If necessary, microwave on low (10 percent power) for 5- to 10-second intervals until it reaches the correct temperature and any remaining bits of chocolate are completely melted.
4. Place the bowl of tempered chocolate on the prepared heating pad. The chocolate is now ready to work with. As you work, regularly stir the chocolate and check its temperature. Adjust the temperature and fluidity of the tempered chocolate by turning the heating pad on and off. If for some reason the chocolate becomes too cold, simply reheat it in the microwave oven on low (10 percent power) for 5- to 10-second intervals. Stir the chocolate for at least 1 minute before rechecking the temperature.

DECORATIVE TECHNIQUES

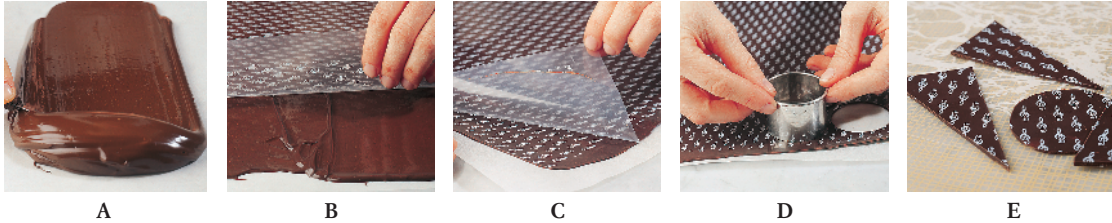
STRIPED CHOCOLATE CIGARETTES

1. Using a metal spatula, spread the tempered white chocolate thinly over a marble slab. Drag a confectioners' comb through the chocolate (A).
2. After the white chocolate has set slightly, pour a contrasting chocolate over it (B).
3. Using a metal spatula, smooth the chocolate into a thin layer (C).
4. After the chocolate has set but is still pliable, form cigarettes with a bench knife: hold it at a 45-degree angle and shave the chocolate off the slab—it will naturally form into tight cylinder (D and E).



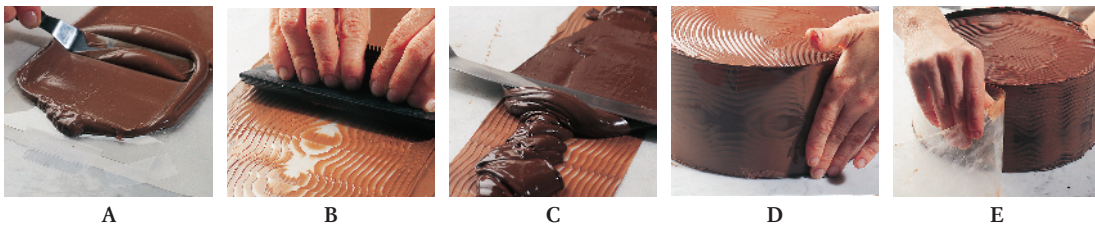
TRANSFER SHEETS

1. Using a metal spatula, spread a thin layer of tempered chocolate onto parchment paper (A).
2. Press a transfer sheet, print-side-down, onto the chocolate (B).
3. After the chocolate has set completely, peel off the transfer sheet (C).
4. Use cutters or a paring knife to form various shapes for garnish (D and E).



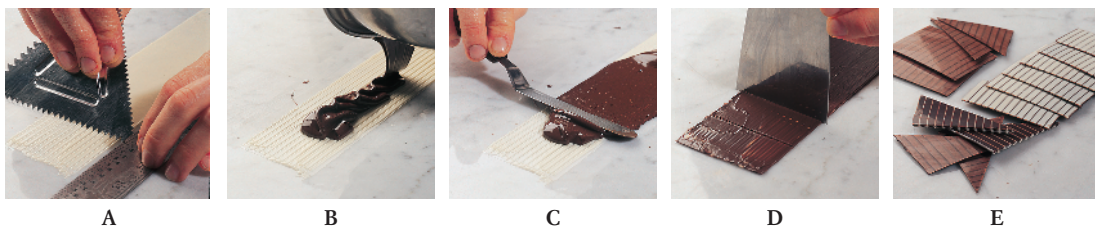
THE WOOD-GRAIN EFFECT

1. Using a metal spatula, spread the tempered chocolate onto a food-grade acetate band, making it a little wider than the wood-grain tool (A).
2. Drag the wood-grain tool in a rocking motion through the chocolate (B).
3. Once the wood-grained chocolate has set, pour a contrasting chocolate over it and spread into a thin layer (C).
4. Before the second chocolate layer sets, wrap the acetate band around the desired dessert form (D).
5. When the chocolate has set completely, peel off the acetate (E).



STRIPED CHOCOLATE DESIGNS

1. Using an offset metal spatula, spread the tempered chocolate in a thin layer onto a food-grade acetate. Using a ruler as a guide, draw a confectioner's comb through the chocolate (A).
2. Once the chocolate has set slightly, pour a contrasting chocolate over it (B).
3. Spread the contrasting chocolate into a thin layer (C). Using a cutter or paring knife, cut into desired shapes (D). Allow the chocolate pieces to set completely, and peel off acetate (E).



INGREDIENTS FOR BAKING BASICS

AMARETTO is an almond-flavored liqueur.

BAKING POWDER is a mixture of baking soda, an acid (such as salt crystals) and cornstarch, as a stabilizer. In double-acting baking powder, air pockets form when the powder comes in contact with wet ingredients and then those air pockets expand when they are subjected to heat, causing the product to rise. Pay attention to baking powder's sale date, or test for freshness by adding a teaspoonful to about four ounces of hot water. If it bubbles, the powder is still good.

BUTTER Unsalted butter is used exclusively in the recipes in this book. Some recipes specify the temperature the butter should be when incorporated. Pay close attention and plan ahead. Butter temperature is crucial to finished results. Wrap unused butter in plastic in the refrigerator, or store it in the freezer.

COFFEE In our recipes you will frequently see instant espresso called for; this is truly the best way to deliver intense coffee flavor without too much moisture. If the recipe calls for granules, it does not mean the liquid.

CORNSTARCH is a thickening agent.

CORN SYRUP is a starch extracted from corn kernels; the kernels are treated with an enzyme to create this sweet syrup. Its role in baking is to prevent sugars from crystallizing, which helps the product to retain moisture and extend freshness.

CREAM Use heavy whipping cream, which contains 36 to 40 percent butterfat. It will be pasteurized, but avoid creams that are labeled "ultrapasteurized." This process, designed to extend shelf life, also flattens flavor.

CREAM OF TARTAR is a white powder found, in trace amounts, in baking powder. By itself, it is used to help prevent beaten egg whites from drying out.

CRÈME FRAÎCHE is a French variation of sour cream; it is very rich and slightly fermented. It can be substituted for sour cream, but it is quite expensive.

EGGS Grade AA large eggs are the best choice for baking, for their thick white and strong yolk. Water and protein material make up the white; the white is used to add volume and air to sponge cakes and mousses. The yolk contains cholesterol, fat, protein, vitamins, and minerals; it is used as a thickener and binder in creams and custards. In general, eggs must be brought to room temperature before using. Before beating eggs, be sure the bowl is absolutely clean.

FLOUR Always use the flour called for in a recipe, paying close attention to addendums like "self-rising," "bleached," or "unbleached," and so on. If a recipe does not call for self-rising flour, do not use it. All-purpose flour is the result of a blend of hard and soft wheats, to produce a flour of medium strength and protein content of 10 ½ to 13 percent. Wheat flours contains some gluten, which provides elasticity and strength, as well as certain characteristics in certain pastries—flakiness, for example. Cake flour, milled from soft winter wheat, does not contain gluten; it is more refined than all-purpose and produces a soft, delicate crumb.

GELATIN is used to help set certain mousses and Bavarians. It must be softened before use, which is a simple matter of placing or sprinkling in cold water and waiting for 5 minutes or more until it swells and absorbs the moisture (blooms).

GLUCOSE is used to replace part of the sugar in ice cream and sorbet recipes; it performs the same function as sugar but is not as sweet.

KAHLUA is a coffee-flavored liqueur.

KIRSCH OR KIRSCHWASSER, is cherry brandy.

MASCARPONE is a smooth, rich cream cheese.

NUTS It is crucial that nuts be fresh. Shelled nuts are available natural (raw, with skins intact) or blanched (skins removed). Nuts can be stored in the freezer, well wrapped, for several months (for blanching and roasting information see Basic Techniques).

PHYLLO, or **FILO**, is pastry dough presented in paper-thin sheets. It is packaged fresh or frozen. Unopened, phyllo will keep in the refrigerator for a month. Once opened, it should be used in two or three days. Phyllo can be frozen for up to one year; thaw completely in the refrigerator before using.

PRALINE PASTE is a combination of almonds and caramelized sugar that is ground to a paste.

RUM Myers's dark rum is preferred for its full flavor.

SALT is used as a flavor enhancer in products containing eggs, butter, and certain fruits, and can cut the sweetness in other desserts when desired.

SOUR CREAM Do not substitute lowfat sour cream.

SUGAR Use the sugar called for in the recipe; when the recipe calls for granulated sugar, use either regular granulated or the superfine variety. Superfine sugar is granulated sugar that has been processed to reduce particle size. Confectioners', or powdered, sugar is granulated sugar that has been milled to powder, with cornstarch added. Brown sugar is granulated sugar with molasses added. Light and dark brown sugar can be used interchangeably, but for precise flavor, use the one called for in our recipes.

VANILLA is a pod fruit from a vine that is in the orchid family, and it produces an irreplaceable sweetness and aroma. Two quality vanillas are Tahitian and Madagascar (or Bourbon). The recipes in this book frequently call for vanilla extract, but when the vanilla flavor must be fresh and impactful, the beans must be purchased, scraped, and the seeds removed, then either the seeds or the seeds and the pod are added to the cooking liquid. Vanilla beans can be stored long-term in the freezer, or short-term in the refrigerator, wrapped tightly in plastic.

BASIC EQUIPMENT FOR THE HOME BAKER AND CANDYMAKER

It is not necessary to run out and buy every piece of equipment shown here in order to make delicious desserts. Not all of the recipes in this book require every device. But if you're serious about applying and improving your skills, you will in time need many of these items. It's a fact of life in kitchens, both

professional and at home: pastry-making requires more specialized equipment than savory cooking. This is due, in part, to the delicate chemical reactions that take place, the precise temperatures and mixing times and methods that can spell the difference between success and brilliance.



1

PHOTOGRAPH 1

RUBBER SPATULAS For folding and mixing batters as well as scraping down the sides of or bowl. They are produced flat-sided or in a concave, spoon-like shape and are available in rubber or in heat-resistant (up to 500°F) silicone.

WOODEN SPOONS Indispensable kitchen tools for many uses; available slotted, unslotted, flat, or concave. Wood is porous and will absorb odors so it is wise to keep a separate set for savory cooking.

CONFECTIONERS' FORK Also known as a dipping fork. Used for dipping chocolates and other confections into couverture.

CANDY THERMOMETER A thermometer that is used to precisely measure the temperature of cooking sugar.

CHOCOLATE THERMOMETER Should have wide spacing between 1°F increments and need not measure very high temperatures (above 130°F).

LONG SERRATED KNIFE Ideal for slicing a cake on the horizontal and also excellent for chopping chocolate. If the serrations are deep enough, it may be suitable for use in place of a cake comb.

CHEF'S KNIFE The most essential knife in the kitchen. Its long, tapered blade ranges in length from 8 to 14 inches.

PARING KNIFE The 2- to 3-inch, easily manipulated blade makes it useful for tasks such as peeling fruit, splitting vanilla beans, and creating garnishes.

METAL SPATULA May be used for icing or glazing cakes and spreading chocolate into thin sheets for creating decorations and garnish. Available flat or offset and from 4 to 12 inches in length.

METAL SCRAPER A rectangular heavy metal scraper is excellent for cleaning off work surfaces; also great for transferring chopped chocolate to a bowl.

WHISKS Whisks are made in different sizes, suited to different functions: large, for whipping ingredients that require a lot of air to be incorporated and for folding other ingredients into these delicate mixtures; medium to small, for making egg- or starch-based sauces and combining ingredients, such as chocolate and cream for ganache, when you do not want a lot of air incorporated.

PASTRY BRUSHES Broad and flat or thick and round, these brushes are ideal for soaking layers of cake with flavored syrup before assembly or for brushing a thin coating of oil or butter on a pastry prior to baking.

ARTISTS BRUSHES For decorative purposes.

PASTRY WHEEL Also known as a pizza cutter. May be used to cut pastry dough, rolled fondant, and other items.

ZESTER A traditional zester may be used to remove the flavorful outer skin of citrus fruit. A metal ginger grater or the fine side of a box grater covered with plastic wrap (facilitating easy removal of the zest from the grater) will also work well.

BOX GRATER Used to grate chocolate for decoration or garnish, and for the removal of citrus zest.

WOOD GRAIN TOOL A rubber piece with conchoidal ridges that has been adhered to a convex surface attached to a handle. It is used to impart a wood grain-like pattern to chocolate by running it over a spread sheet or strip of melted, tempered chocolate, allowing the chocolate to partially set up and then spreading an alternate color of melted, tempered chocolate over the first layer. Most readily available in hardware or paint stores.

PHOTOGRAPH 2

MIXING BOWLS Glass or stainless steel bowls are equally suited for mixing. Plastic is a porous material and will retain odors and oils, making such bowls unsuitable for fragile egg whites.

DOUBLE BOILER Two pans that fit together. The lower pan holds water, which is heated to a simmer; the top pan contains what is to be heated. A metal (stainless steel) bowl works well. Used for foods that need gentle heat.

CAKE BOARDS Sturdy corrugated cardboard rounds and rectangles in various sizes, used to support a cake at the base. Also available with a wax coating, and in decorative gold and silver with scalloped rims.

COOLING RACKS Work well for cooling baked goods in and out of the pan because they allow for full air circulation around the cake or pastry. They are also ideal to use when glazing because they allow for the excess glaze to drip off the cake, creating a clean bottom edge.

SILICONE BAKING MAT A thin, flexible mat that has been treated with silicone to make its surface nonstick. These mats are reusable and are available in full and half-sheet pan sizes.

TURNTABLE A pedestal approximately 5 inches tall, with a rotating top to facilitate decorating and frosting a cake.

HEAVY-DUTY ELECTRIC MIXER A 4½- to 5-quart bowl is necessary to properly develop volume by the incorporation of air. A stronger machine of 325 to 350 watts is ideal for mixing stiff doughs. A paddle, whip, and dough hook attachment are also important. We recommend the KitchenAid.



FOOD PROCESSOR The metal chopping blade is most often used in the pastry kitchen. Indispensable for chopping nuts, mixing doughs and batters, and for the emulsification of ganaches (especially when making truffles).

TARTLET PANS Used for making individual tarts. The sides are usually fluted, but may also be plain. Range in size from 1¼- to 4¾-inch diameter and ⅝- to 1¼-inches in height.

FLEXIPANS Flexible baking pans that are available in varying sizes and shapes. These pans withstand temperatures from -40°F to 536°F and may go from freezer to oven or microwave.

CAKE PANS Aluminum is preferable because it has good heat conductivity, but will not retain heat as do glass pans. Light-colored pans are better because they will not absorb extra heat from the oven.

JELLY ROLL PAN Made of heavy-gauge aluminum with rolled edges to prevent warping and rusting, and to facilitate even heat conduction. Standard size is 11½-by-17½-inches.

ROLLING PINS Available in a wide range of sizes and materials: plastic, metal, glass, marble and hardwood. It is useful to have two types of rolling pins for dessert-making: the hardwood broom-handle type, which is a wooden dowel 18 to 20 inches in length having a diameter of 1¼ to 2 inches, and the hardwood model that is manufactured with a steel rod and a ball bearing system. It is good to have a long and heavy one to ease the task of rolling out doughs.

TART PANS Most commonly available shapes are rectangular (14¾-by-4½ inches), square (9-by-9 inches) and round with an 8-, 9½- or 11-inch diameter; all are approximately 1-inch deep. Extra-deep, round tart pans are also available. Removable bottoms are a necessity.

PHOTOGRAPH 3

PARCHMENT PAPER Available in full-sheet, pan-sized sheets or in rolls. It is used for lining baking pans to provide a nonstick surface.

PARCHMENT TRIANGLES Rolled into cones, they may be used in place of a pastry bag for decorating work.

PLASTIC DOUGH SCRAPER Used for the same applications as a rubber spatula; it covers more surface area but has no handle.

DECORATING COMBS A scraper with scalloped or serrated edges that is used to give a texture or a pattern to the sides and/or top of a cake after frosting. Also used for different applications with chocolate such as creating decorative lines or stripes.

PASTRY BAGS Conical bags that are made of fabric, fabric lined with plastic, nylon, or disposable plastic. Available in various sizes. When fitted with a pastry tip, they are used for decorating and filling pastries, cakes and confections.

PASTRY TIPS Metal, conical fittings that are placed in a pastry bag or attached to the bag with the use of a coupler. The most commonly used tips are the plain and star tips. All tips are available in various sizes and are used, in conjunction with a pastry bag, to fill and decorate cakes, pastries, and confections.



COUPLER A device that is fitted at the end of a pastry bag so that pastry tips may be changed without having to empty the contents of the bag. Available in various sizes to accommodate the various sizes of pastry bags and tips.

ASSORTED CUTTERS For cutting cookie dough, cake (to make individual cakes of petits fours), gelée, and chocolate (to make garnishes).

ACETATE STRIP ROLL Melted, tempered chocolate is spread on this surface so that it may be bent into ribbon-like forms. The ultra-smooth surface will give the chocolate a shiny finish. The strips may also be used to line cake ring molds so that pastries will release easily.

TRANSFER SHEET An acetate sheet with a cocoa butter visual image. Melted, tempered chocolate is spread on a sheet, allowed to set, then released, and the image adheres to the chocolate.

MARBLE SLAB This cool, smooth surface is ideal for chocolate work, such as making cigarettes and tempering, and rolling out pastry.

MEASURING EQUIPMENT It is important to have separate equipment for solid and liquid measure to ensure accurate ingredient amounts.

STRAINERS AND SIEVES Work well as sifters, are essential for making sauces, and are useful for making slightly overheated chocolate usable.

SQUEEZE BOTTLE Plastic bottles with removable, fine-pointed tops. They are used for distributing sauces and fillings.

RING MOLDS Various heights and diameters make these molds extremely versatile for creating cakes and individual desserts out of mousse, Bavarian cream, ice creams, and the like. Manufactured in metal and plastic.

SCOOPS Scoops with the sweep-blade mechanism are useful for portioning mousses, ice creams, and doughs. Available in round or oval (quenelle) shapes and in various sizes.

SAUCEPANS Heavy-bottomed pans facilitate conduction of heat. They must be made of nonreactive material, such as stainless steel, but not aluminum. When cooking in a saucepan it is important to choose the size of pan that is appropriate for the volume of food to be prepared.

SCALE Balance scales, also known as bakers' scales, are excellent for measuring quantities larger than 1 ounce. They are, however, large and cumbersome, especially for home use. Spring and electronic scales are both of convenient size and are sensitive to fractions of an ounce. The electronic scales use the same type of mechanism as the spring scale, but the digital readout and the ease with which they may be zeroed out so that more than one ingredient can be weighed in the same container make this type of scale the most convenient.

ICE CREAM MACHINE The small machines for home use consist of an insulated container, a paddle, and its motor. The paddle acts to agitate the mixture as it is freezing. An absolute necessity for making frozen desserts, machines are available for less than \$50.

BRIOCHE MOLDS Available in various sizes to make individual portions or larger sizes. The fluted sides make them an interesting choice for molding other desserts.

MADELEINE PAN Scalloped-shaped impressions mold the traditional cookies, but these pans may also be used to shape any number of confections. They are available in two sizes. The larger has 12 impressions per pan and the pans for making small madeleines contain 20 impressions per pan.

RAMEKIN Also known as soufflé pan or soufflé dish. Available in various sizes, from large to individual. Used for custard and soufflé desserts that are baked and served in the same container.

PROPANE TORCH (not pictured) A helpful tool for browning or caramelizing the tops of desserts. For some desserts that will be destroyed by the heat of a broiler it is necessary; for others it will simply make the procedure quicker and easier.

BASIC TECHNIQUES

In the creation of fine desserts and candies, certain techniques are used frequently. Following are helpful hints and guidelines to these basic procedures. They will become second nature to you as your skills increase—and your reputation grows.

FROSTING A CAKE Always begin at the top and end at the sides. When the cake is entirely, proportionately frosted, smooth the rim of frosting that will have formed around the top edge of the cake with a spatula. Spread this excess frosting in toward the center of the top of the cake.

LINING CAKE PANS This is a recipe step that prevents a skin of flour from forming on the bottom of the baked cake, and it makes it easier to remove the cake from the pan and invert.

MEASURING DRY INGREDIENTS We measure flour, cocoa, and other dry ingredients by spooning them lightly into the measuring cup and leveling with a spatula or the straight edge of a knife. Do not tap the measuring cup.

TO BLANCH ALMONDS place them in a pot of simmering water for about one minute. Using a strainer, remove them from the simmering water and place them in cold water. By pinching each nut, the skin will slide off. They must be completely dry and cooled before grinding.

TOASTING is important to bring out the full flavor of most nuts, especially almonds and hazelnuts; do not buy pre-roasted nuts; the flavor will drastically affect the dessert.

To toast nuts: Position a rack in the center of the oven and preheat to the temperature called for below. Place the nuts in a single layer on a baking sheet, and shake the pan two or three times during the toasting period. After toasting, place the nuts on a room-temperature baking sheet to cool completely.

To toast and blanch hazelnuts: 8 to 12 minutes in a 350°F. (Extra step: After toasting, wrap the nuts in a clean towel and cool completely. Transfer the nuts to a large sieve and rub them back and forth to remove the loose skins. Remove the nuts from the sieve.)

To toast whole almonds: 10 to 15 minutes in a 350°F oven. Blanched almonds will be golden when done; natural almonds will be a light brown all the way through (cut in half to check).

To toast sliced or slivered almonds: 5 to 10 minutes at 325°F.

To toast walnuts and pecans: 5 to 10 minutes at 350°F.

SPLITTING CAKES TO FORM LAYERS: Make sure that the cake is completely cool, or it will crumble when you attempt to cut it. Set the cake layer on a cake-decorating stand, lazy Susan, or cardboard cake circle. Use a serrated knife that is longer than the diameter of the cake. If a dome has formed on the cake, trim it so that it is flat. Make a small notch lengthwise down the side of the cake layer (you can use this mark later to help you properly align the layers).

Lay one hand lightly on the top of the cake to steady it, place the knife at the midpoint of the side of the cake, and hold the knife in place while turning the cake with the other hand, creating a horizontal, scored line completely around. Using this scored line as a guide, carefully saw straight through the cake layer. Repeat with the second cake layer, if applicable.