"Food of the Gods" The rich history of chocolate

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ABSTRACT: The story of chocolate spans whole millennia and whole continents. Though in its present form, chocolate may only be, at most, some 400 years old, the consumption of its primary ingredient, cocoa or Theobroma cacao (literally "food of the gods") has been traced back to some 4000 years ago. Since then, the history of cocoa's social, economic and, as its Latin name suggests, religious significance involves an array of fascinating facts, vivid legends and the moving tales of kings, noblemen, explorers, scientists and gods. Far from a mere object of indulgence, cocoa has been at the centre of medicine, nutrition and religion since the earliest times of human civilization.

THE ORIGINS OF CHOCOLATE

Like coffee, the cocoa bean is a descendent of the mysterious pre-Columbian cultures of Latin America where it was first consumed as a medicinal drug. Archaeologists trace its origins to a small village in the Ulúa valley of Honduras, around 2000 B.C. It is here that special drinking cups and plates have been found, made exclusively for the consumption of Xocoatl, the earliest known chocolate drink. Scientists now consider this small village to be the true cradle of chocolate.

Quetzalcoatl

In fact, cocoa fulfilled a major social and religious function in these ancient civilizations and was even used as currency in the Mayan period between A.D. 250 and 900. "Cacau" originally meant "carrying over from those who walk, work or cultivate," which is interpreted to mean an act or means of exchange or payment. Following the Mayans, the Toltecs and, later, the Aztecs established themselves in Mexico around 1300. The Aztecs adopted a lot of the Toltecs' cultural and religious practices, including the worship of the feathered god of cocoa, Quetzalcoatl. According to legend, Quetzalcoatl was given cocoa as a gift from the gods and lived a wealthy life with his people in a paradise known as Tula. However, jealous intruders poisoned Quetzalcoatl who was subsequently driven insane and disappeared on a raft in open sea. The Aztecs always believed that Quetzalcoatl, their king and god of cocoa, would one day return to Mexico. In a strange twist of fate which has since become legendary, Quetzalcoatl did make a return of sorts, one which resulted in the discovery of chocolate by the West. The rest, as they say, is history.

THE 'DISCOVERY' OF CHOCOLATE

Although Columbus is rightly credited with the 'discovery' of cocoa, being offered it on his fourth journey in 1502 by locals of the island of Guanaja near Honduras, it was Hernando Cortés who discovered the true value of this ancient fruit some 17 years later on the shores of Mexico. The Aztecs had in fact mistaken him for their god, Quetzalcoatl and subsequently presented him with offerings of cocoa. Though he had come in search of gold, Cortés quickly learned that cocoa was just if not more valuable. It was he who established the first plantations and discovered the recipe for the original chocolate drink: a red, bitter and spicy concoction called Xocoatl. Xocoatl was prepared and consumed as an integral part of Aztec rituals and tribal ceremonies. However, the colonials soon realized its nutritional value and powerful medicinal properties as well and Hernando Cortés returned to Spain with the first beans in 1528. The Aztec chocolate drink created quite a stir on the continent within social and religious circles alike.

In 1590, the drink underwent its first transformation, laying the foundations for the chocolate recipes we know today. It was then, namely, that Spanish monks added honey, vanilla and sugar cane to adapt the chocolate drink to European tastes. Chocolate, in other words, was ready to conquer the world and was introduced by merchant traders and explorers in Italy, France, Prussia, the Low Countries and eventually Switzerland. The royal courts become overrun by the early 17th century and the aristocracy and nobility similarly swept off their feet by the new delicacy. France produced its first true chocolatier in David Chaillou who in 1659 made chocolate biscuits and cakes for the wider public. However, chocolate remained an expensive commodity and the exclusive privilege of the rich.

Oddly enough, chocolate was treated with great scepticism by the Church in the early 17th century. Manuscripts record discussions about the permissibility of chocolate, revealing its general perception amongst the clergy as a sinful and decadent diversion. It was not until 1660 that the Church was forced to permit the consumption of chocolate to please its wealthier devotees, some of whom had even taken to consuming their chocolate drink during mass to sit out the lengthy service.

As the consumption of chocolate became more and more widespread during the 18th century, the Spanish monopoly on the production of cocoa soon became untenable and plantations were soon established by the Italians, Dutch and Portuguese. At this point in its history, chocolate was still consumed in liquid form and was mainly sold as pressed blocks of a grainy mass to be dissolved in water or milk to form a foamy chocolate drink. The mass-production of these chocolate blocks also began in the 18th century when the British Fry family founded the first chocolate factory in 1728 using hydraulic equipment to grind the cocoa beans. The first US factory was built by Dr. James Baker outside Boston a few decades later and in 1778 the Frenchman Doret built the first automated machine for grinding cocoa beans. It was not until 1828, however, that the production of cocoa and chocolate was truly revolutionized by the invention by Dutchman, Coenraad Van Houten of a cocoa press which succeeded in separating cocoa solids from cocoa butter. The resulting defatted cocoa powder was much easier to dissolve in water and other liquids and paved the way, in 1848, for the invention of the first real "eating

chocolate", produced from the addition of cocoa butter and sugar to cocoa liquor.

The first milk chocolate was invented in 1875 by the Swiss, Daniel Peter who had the idea of adding milk powder - an invention of his countryman, Henri Nestlé, a decade earlier. By the late 19th century, with the invention of the conching machine by another Swiss, Rudolphe Lindt, chocolate had come to take on the fine taste and creamy texture we now associate with good quality chocolate. It was still very much an exclusive product, however, and it was not until 1900 when the price of chocolate's two main ingredients, cocoa and sugar, dropped considerably that chocolate became accessible to the middle class.

The production of cocoa had, namely, spread from Central and South America to Africa and Asia. Large plantations were gradually replaced by smaller, independent farms. Prices were further reduced by 1910 as the industrialization of chocolate production took off all over Europe and the U.S. Countries like Belgium emerged at the cutting edge of innovation with fast manufacturing technologies and new marketing techniques. The big names in the chocolate world were established around this time. Brands such as Callebaut and Cacao Barry became the accepted standards, producing fine quality chocolate for bakers, chocolatiers and pastry chefs. The world's most renowned chocolatiers also emerged in the early 20th century: Neuhaus and Godiva in Belgium, La Maison du Chocolat and Fauchon in France, Lindt, Suchard and Sprüngli in Switzerland... It was Jean Neuhaus, however, founder of the famous Belgian house, who is credited with the invention of the Belgian praline in 1912, filling chocolate shells with cream and nut pastes.

By the 1930s and 1940s, new and cheaper supplies of raw materials and more efficient production processes meant that chocolate had finally become affordable for the wider populace. In terms of kilojoules per gram, it had in fact become the least expensive foodstuff. Since the second world war, chocolate has grown to become a fixture in our daily eating habits and continues to be the world's most popular, small-sized snack. As new products and innovations continue to be developed, the future of this ancient, all-natural product is likely to be as rich as its long history.

THE MAKING OF CHOCOLATE

Transforming cocoa beans into chocolate involves a highly complex process which begins, naturally enough, with the growth and harvest of cocoa beans. Though indigenous to the tropical rainforests of Honduras, Venezuela and Mexico, Theobroma cacao was soon cultivated by the Spanish in plantations set up across the globe. Today, cocoa is grown on several continents, within the narrow equatorial belt that crosses the Americas, Africa and Asia. In its traditional environment, the sapling cocoa tree is protected from excessive heat and wind by the larger trees of the rainforest. It starts developing fruit within five years, producing thousands of tiny white (female) and pink (male) flowers in six monthly cycles. No more than 40 of each tree's flowers, however, develop into the cocoa pods that form the basis of the chocolate-making process.


Cocoa beans

The cocoa pods are left to ripen over a period of six months. During this time, their colour changes from green to yellow, orange or red, at which time they are ready to be harvested. There are two harvests per year. In African countries, such as the Ivory Coast and Ghana, where the majority of the world's cocoa is now grown, the main harvest is from October to March and the mid-crop from May to August. Farmers cut open the outer peel of the cocoa pods with machetes and extract the fruit pulp inside. The pulp of a single pod contains some 40 to 50 seeds: the precious cocoa beans. The beans are left in the open to ferment, depending on the variety, for five to seven days, during which time any excess pulp around the beans is removed. During this natural fermentation process, the beans change from grey to brown in colour and begin to develop their distinct aroma, the first precursors to the taste of finished chocolate. After fermentation, the cocoa beans are spread out and left to dry in the sun for around six days. Drying terminates the fermentation process but also enables the beans to be stored and transported more reliably. When sufficiently dried, the beans will have lost almost all of their moisture content and more than half their weight. They are then typically transported by the cocoa farmers to collection points where they are graded, weighed and packed into sacks.

Good quality chocolate is made from carefully selected cocoa beans. Beans from different cocoa varieties and growing conditions are blended to achieve specific taste profiles and aromas. The beans are first cleaned to remove stones, dirt and sand before being dried a second time under heaters. This second drying of the beans makes it easier to break them open and remove their outer shell. The remaining kernels or cocoa "nibs" as they are called are then roasted. This stage of the process is extremely important for defining the specific aroma of the resultant cocoa. Temperature and humidity levels and of course the length of time of roasting are all critical in establishing the taste-precursors to be exploited during later stages of the chocolate-making process.


The grinder

The roasted cocoa nibs are ground in special grinders into a very fine, liquid mass, the so-called cocoa "liquor". This cocoa liquor is further processed to yield either cocoa butter or cocoa powder. However, it is also used directly as an ingredient in chocolate. Generally speaking, the higher the percentage of cocoa liquor, the darker the chocolate. The main ingredient of dark chocolate is in fact cocoa liquor, complemented by the addition of cocoa butter and sugar. White chocolate, on the other hand, contains no cocoa liquor at all, and is made purely from cocoa butter, sugar and milk powder.

Depending on the recipe, the respective ingredients in varied quantities are blended into a homogenous chocolate dough. This dough is pressed between rollers to produce a highly refined chocolate powder. The particles of this powder are so small that they can no longer be distinguished by the human tongue. The finished chocolate thus achieves an extremely smooth texture and homogenous flavour.

Next comes the conching stage in which the chocolate powder is kneaded for several hours in large tanks or "conches". The powerful beaters inside the conches slowly knead the chocolate mixture over a long period of time. The friction and resultant heat, coupled with the contact with the air, bring about several different physical and chemical reactions that help refine the aroma of the resultant chocolate. For one, the heat generated during conching melts the cocoa butter contained in the cocoa liquor as well as the fats contained in the milk solids used to make milk and white chocolate. These fats then spread throughout the miniscule particles of the chocolate mixture. Any moisture remaining in the mixture

subsequently evaporates and certain volatile acids are partially or totally broken down, depending on the conching time. This, too, has a marked effect on the final taste. Finally, the heat and friction cause the sugars to partially caramelize, which is particularly critical for the flavour of milk and white chocolate. All these processes mean that the conching of chocolate powder is an extremely complex process which demands expert knowledge, experience and constant monitoring.

After the conching process, more cocoa butter is added together with an emulsifier (such as soy lecithin). Besides enhancing the flavour, the addition of cocoa butter also effects the viscosity, making the chocolate mix more liquid. This, too, is a critical stage and the viscosity is measured and adjusted in order to reach the desired specifications depending on the application. To make solid blocks, hard drops, chunks or bars of chocolate, the liquid chocolate is tempered, moulded and finally hardened. The tempering process involves the crystallization of cocoa butter and has a defining role in the texture and mouth feel of the finished product. Solidified cocoa butter has six different crystalline forms, some of which can take weeks to form. The ideal structure is achieved through meticulous temperature control during cooling. Tempered too quickly or at the wrong temperature and the resultant chocolate will be either too powdery or too brittle. After tempering, the chocolate can be poured into moulds or made into drops and then cooled. Once cooled, the chocolate becomes hard and shiny, ready for packaging and consumption.

THE MANY FACES OF CHOCOLATE

There are many varieties of chocolate now available on today's market, the result of over a century of experimentation and innovation since the invention of the first solid, eating chocolate in 1848. The most well-known varieties, namely dark, milk and white chocolate are produced by varying the ratio of cocoa solids to cocoa butter and, in the case of milk and white chocolate, through the addition of milk powder. However, an endless array of other flavours are possible by the addition of other flavours, on the one hand or through the selection of specific cocoa varieties on the other.

Chocolate owes its overwhelming taste and indulgent character to the powerful flavours locked within the cocoa bean. While conventional chocolates are made from a blend of varieties aimed at achieving a stable, consistent taste profile, many so-called "origin" chocolates exploit the unique and exceptional properties of certain cocoa varieties grown in specific regions, countries or even individual plots. These rare and highly sought-after cocoa varieties offer a unique sensory experience with expressive flavours and delicate fruity, herbal, spicy or floral notes, reflecting the individual qualities of the cocoa varieties and the habitat and unique conditions in which they grow. "Single origin" chocolates, for instance, are made from fine flavour cocoa beans harvested in one specific country. The uniqueness of the soil, the climate and the habitat leave their mark on the cocoa beans, affecting the character and intensity of their aroma. However, the variety of cocoa species growing in larger regions, such as the Amazonian basin or the Pacific region are also exploited together in "regional origin" chocolates made from a selection of the rarest varieties within one region. Complementary varieties with matching taste profiles are meticulously blended, roasted and conched in the right proportions. The end result is an origin chocolate with an expressive, aromatic character and a nonetheless balanced, harmonious taste profile.

The turn of the millennium has brought an array of other exciting new trends in the production, consumption and marketing of chocolate. Chocolate is now available in a wide variety of flavours, shapes and applications ranging from chocolate confectionary, cakes and biscuits to drinks, ice cream inclusions, toppings and spreads. However, innovations are not just limited to how chocolate looks or tastes. Fair trade and organic chocolates, for instance, have become increasing popular as attention is drawn to processes behind the scenes of production. Intensive research conducted over recent decades by the world's leading manufacturer, Barry Callebaut, has also resulted in several exciting chocolate applications answering to the growing demand amongst consumers for nutritious, functional foods that improve our health and wellbeing. Barry Callebaut has been successful, for instance, in producing and marketing tooth-friendly chocolate, lactose-free milk chocolate, chocolate with reduced fat and/or sugar content and chocolate enriched with dietary fibre, to name but a few. A recently developed probiotic chocolate has even proved to be very effective at introducing beneficial bacterial strains to restore and improve the balance of the intestinal micro flora, thought to play a major role in metabolism and immune response.

Much of these research efforts have involved "going back to the bean" with studies aimed at unlocking and enhancing the nutritional and medicinal properties of cocoa that have been exploited for millennia. Since the discovery of antioxidants and the growth of evidence supporting their beneficial effects on a range of bodily functions from cardiovascular health to the immune system as well as the prevention of several types of cancer, manufacturers have been keen to exploit the abundance of powerful antioxidants in the cocoa bean. Barry Callebaut has since succeeded in developing a process (ACTICOA™) to preserve these natural antioxidants that are otherwise partially lost during the normal chocolate-making process. The company has also developed an array of other cocoa applications such as a pure vegetable cocoa butter powder for frying, with a neutral effect on cholesterol levels, a brewing agent which optimizes the fermentation of yeast in the brewing of beer and even an anti-aging ingredient for skincare products.

Chocolate may have come a long way since its earliest origins in the valleys of Honduras. However this ultimate symbol of luxury and indulgence still holds untold mysteries and secrets that are only now beginning to unfold.