Marijuana

Neolithic Chinese legend "the gods gave humans one plant to fulfill all their needs."

- This plant was *Cannabis sativa*.
- Bast fibers can be used in ropes, fishnets and clothing
- Seeds are highly nutritious
- oil from the seeds can be used for lamps, paints, lubrication

Cannabis is among the oldest cultivated plants

- 10,000yr old potsherds imprinted with cordage made from hemp
- first true paper was made from hemp in A.D. 105 (China)
- hempen clothes were worn to show respect for the dead (China)

Marijuana rivals alcohol in regular use

- 100 million regular users in 1990
  - India--Bhang, made with ground Cannabis leaves, milk, sugar and spices
  - Denmark--marijuana and hashish bars

Cannabis is native to central Asia

- seeds are dispersed by water, wind, birds and animals (most notably humans)
- dioecious species with both male and female plants

Psychoactive properties

- Chinese grew the plants close together to increase fiber production
  - –male and female plants equally productive for fiber
- Indians (east) grew the plants spaced far apart to increase resin production
  - –more resin is produced in hot dry areas--the resin coats the leaves and flowers to prevent desiccation
  - –more resin is produced by the female plant than the male plant
  - –resin is produced by the female flowers and upper leaves
  - –Sinsemilla--unfertilized plants, have the most resin
- Hashish-relatively pure resin
  - –in Nepal naked men run through fields of flowering female plants and then scrape off the clinging resin globules
- Many works of art, both visual and literary were created under the influence of marijuana
  - –Alexandre Dumas, Victor Hugo, Eugene Delacroix, Charles Baudelaire, W. B. Yeats, Oscar Wilde
  - –Tales of the Arabian Nights provided a romantic introduction to hashish

Loss in productivity led to outlawing marijuana in many countries

- •1870-South Africa passed the first anti-Cannabis law
- •1920s America--ardent campaigning by Narcotics Bureau led to condemnation of marijuana
- •Louisiana, Texas and Illinois were the first states to banned the use

League of Nations agreed to an international statute against its use

- •1937 the use of Cannabis came under federal jurisdiction with the Marijuana Tax Law which did not outlaw use, but taxed it very heavily

Use as a medicine

- •Chinese used Cannabis as a relaxant and to correct spiritual imbalances
- •15th century--given to calm women during childbirth and fed to babies when they were weaned
- •Has many virtues
  - –1965--THC or delta-trans-tetrahydrocannabinol (a complex alcohol) isolated
  - –effective pain reliever
  - –reduces nausea experienced by radiation or chemotherapy patients
  - –provides relief for asthma patients by dilating the bronchial vessels
- •some states have allowed prescription of marijuana cigarettes or THC pills

Action of THC on the brain was discovered in 1990

- •found a receptor to which THC binds
- •this suggested that there is a similar compound produced naturally by the body
  - –anandamide (Sanskrit word meaning "internal bliss"
- •raises hopes that synthetic drugs with desired medicinal properties but without the psychoactive effects can be designed

No conclusive evidence for addiction or permanent deleterious medical effects with moderate use

- •heavy use has been correlated with psychological and physiological problems
- •use does easily become a habit
- •heavy use leads to reduced motor coordination, impairment of short-term memory and low sperm count

•heavy smokers develop lung disorders similar to tobacco smokers

- •may be a high probability that heavy users will turn to "hard drugs"

Statistics show that marijuana is less deleterious than the legal more widespread counterparts alcohol and tobacco

Cocaine

Cocaine is found in the leaves of the coca plant, *Erythroxylum coca*, and *E. novogranatense*

- native to the north central Andes
- used in this region long before Europeans discovered South America
- Coca plants grown at higher altitudes contain a higher percentage of the cocaine alkaloid than those grown at lower altitudes.

TRADITIONAL USES

Cocaine is both a central nervous system stimulant and an anaesthetic.

- Chewing coca leaves counters the symptoms of 'mountain sickness' and oxygen-deprivation.
- Lessens the feelings of hunger and fatigue
- The traditional method of coca use is to chew the leaves, producing a mild stimulation.
  - –pick and dry the leaves
  - –"sweat" the leaves--ferment them slightly to make them pliable
  - –dip the leaves in lime (ash is often used). This raises the pH which aids in the extraction and absorption of the alkaloids
  - –the masticant is expelled or swallowed
- typically a native coca chewer may chew 57 g of coca leaves
  - –The cocaine content of the leaves ranges from O.1% to 1.5%.
  - –this allows extraction of 0.002 g of cocaine
- heavy users can use up to 2-3 g a day plus adulterants

FORMS OF COCAINE

Outside of South America it is generally used in its more refined and extracted forms

- powder cocaine (coke)
  - –usually taken as a hydrochloride "salt" diluted with sugar, caffeine or lidocaine
  - –powdered cocaine is generally snorted (inhaled)
  - –water soluble and moves across mucous membranes easily
  - –snorting cocaine provides a lower high with effects lasting up to 30 minutes
  - •freebase cocaine
  - –produced with volatile solvents (highly flammable)
  - –generally smoked but can be injected
  - –causes a strong, short-lived peak of about 3-5 minutes
- "Crack"
  - –is alternately used to refer to street quality freebase cocaine, or the product of a particular manufacturing process
  - –uses sodium bicarbonate rather than a flammable solvent
  - –generally smoked but can be injected

NAME :
Cocaine
CHEMICAL NAME :
[1R-(exo,exo)]-3-(Benzoyloxy)-8-methyl-8-azabicyclo[3.2.1]octane-2-carboxylic acid methyl ester
ALTERNATE CHEMICAL NAMES :
3beta-hydroxy-1alphaH, 5alphaH-tropane-2beta-carboxylic acid methyl ester benzoate
2beta-carbomethyoxy-3beta-benzoxytropane, ecgonine methyl ester benzoate
l-cocaine, beta-cocaine, benzoylmethyl-ecgonine
CHEMICAL FORMULA
$C_{17}H_{21}NO_4$
MOLECULAR WEIGHT
303.36
MELTING POINT
98° (monoclinic tablets)
MELTING POINT
195° (Hydrochloride)
MELTING POINT
58-63° (Nitrate dihydrate)

MERCK INDEX ENTRY
2515. Coca. Erythroxylon; cuca; hayo; ipado. Dried leaves of *Erythroxylon coca* Lam., Erythroxylaceae. Habit. Bolivia, Brazil, Peru, cultivated in Java. Constit. 0.5-1% alkaloids in the South American, 1.5-2.5% in the Javanese leaves. In the former, the major alkaloid is cocaine; in the latter, there is very little cocaine, the alkaloids, consisting chiefly of ecgonine derivatives such as benzoyl ecgonine, methyl ecgonine, etc. The Java leaves also contain small quantities of tropococaine which is apparently absent in the South American leaves. Other "cocaine" alkaloids present are truxillococaine, isatropylcocaine or cocamine, cocaicine.

PHYSICAL EFFECTS:

- •Inceases heart rate, blood pressure, and body temperature.
- •Increases pulse, and respiration.
- •dilates the pupils
- •decreased sleep and appetite,
- •can cause seizures, strokes, heart attacks, death.

PSYCHOLOGICAL EFFECTS:

- •Varies with dose and the tolerance of the user.
- •may increases alertness, wakefulness, elevates the mood, mild to high degree of euphoria
- •may increase athletic performance
- •decreases fatigue, clearer thinking, increases concentration, increases energy,
- •increased irritability, insomnia, restlessness.
- •With high doses may exhibit a pattern of psychosis with confused and disorganized behavior, irritability, fear, paranoia, hallucinations, may become extremely antisocial and aggressive.

WITHDRAWAL SYMPTOMS:

- •Intense cravings, hunger, irritability, apathy, depression, paranoia, suicidal ideation, loss of sex drive, insomnia or excessive sleep.
- •Often, more cocaine is taken to reduce these effects.

OVERDOSE SYMPTOMS:

Agitation, hostility, hallucinations, convulsions, high temp., possible death, stroke, or heart attack.

People with latent congenital heart defects may have heart problems including heart failure.

COCA TIMELINE

c. 3000 B.C.

Coca chewing practiced throughout South America. Coca believed to be a gift from God.

1400s

Coca plantations operated by Incas in Peru.

1505

First hand accounts of coca use made their way back to Europe.

Amerigo Vespucci (1505),

G. Fernandez de Oviedo (1535)

Nicholas Monardes (1565).

Early 1500s

Incan Coca plantations are taken over by holders of Spanish land grants. Spanish tax laws

are revised to allow land owners to make their tax payments in coca leaves.

1539

The Bishop of Cuzco tithes coca, taking 1/10 of the value of each crop in taxes.

Mid 1500s

Coca production in Peru expands quickly causing a glut of leaf on the market which in turn

precipitated a drop in the price of coca.

1574

Monardes' text on Coca is first translated into other European languages from Spanish;

Latin (1574),

Italian (1576)

English (1577).2

c. 1575

Forced laborers working in the Spanish silver mines were kept well supplied with Coca leaves.

Most of the Europeans living in Peru were involved in the Coca trade.

1662

Abraham Cowley writes a poem titled "A Legend of Coca". This is the first independent mention of coca in English literature.

1708

Coca is first mentioned in a materia medica, Institutiones Medicae, written by German physician and botanist Herman Boerhaave.

1835

First accurate drawing of Coca appears in popular English press. The illustration by Sir William Hooker, director of the Kew gardens, was published in

Companion to the

Botanical Magazine

c. 1850

Coca tinctures used in throat surgery

c. 1855

Cocaine first extracted from Coca leaves

1862

Merck produces 1/4 pound of cocaine

1869

Seeds from a commercial variety of Coca arrived at Kew Gardens.

1870

Vin Mariani (Coca wine) is for sale throughout France, containing 6 mg cocaine per ounce of wine.

Exported Vin Mariani contained 7.2 mg per ounce to compete with the higher cocaine content of American competitors

1870s

Parke-Davis manufactures a fluid extract of coca

1876 - 1885

Race walkers in England chew Coca leaves to improve their performance

1883

Merck produces 3/4 pound of Cocaine

1884

Cocaine's use as a local anesthetic in eye surgery is popularized

1884

Freud publishes "On Coca" in which he recommends the use of cocaine to treat a variety of conditions including alcohol and morphine addiction

1884

Merck produces 3,179 pounds of Cocaine

1886

Merck produces 158,352 pounds of Cocaine

1886

Coca-Cola is first introduced by John Pemberton, containing cocaine laced syrup and caffeine.

Late 1880s

Parke-Davis starts to manufacture refined cocaine

c. 1901

Coca-Cola removed Coca from their formula

c. 1905

Snorting cocaine becomes popular

1910

First cases of nasal damage from Cocaine snorting are written of in medical literature

First cases of nasal damage from Cocaine snorting are seen in hospitals.2

1912

U.S. government reports 5,000 Cocaine related fatalities in one year

1914

Cocaine banned in United States

Early 1930s

Japan is the world's leading cocaine producer (23.3%) followed by the United States (21.3%), Germany (15%), U.K. (9.9%), France (8.3%).3

ca. 1976

Freebase cocaine first developed (probably in California). It would soon be popularized by
dealers and glamorized by Hollywood media.

1981

Wholesale cost of 1 kg of cocaine is $55,000.5

1984

Wholesale cost of 1 kg cocaine is $25,000.1

Mid 1980's

Freebase cocaine becomes popular.

OPIUM

Poppies in the United States are best known as garden ornamentals or for edible seeds (birdseed) but they rose to fame because of opium.

Collection of opium from fruits of the opium poppy, Papaver somniferum (Papaveraceae)

- the name opium comes from the Greek word opion for poppy "juice"
- extends back at least 3000 B.C.
- Sumerian tablets from 2500 B.C. refer to opium as the "joy plant" and describes the ingestion of small balls of the latex to induce sleep and relieve pain
- opium is mentioned in every one of the medical texts written during ancient Greek and Roman times
- The early Greeks drank wine in which latex had been dissolved--this led to a trance-like state and they associated poppies with divinities
  - –Hypnos, the god of sleep
  - –Morpheus, the god of dreams
  - –Thanatos, the god of death

It is commonly thought that the Chinese introduced opium to the rest of the world but China was ignorant of the drug until the seventh century A.D. when Arab traders brought samples to the orient

- the original use was to cure dysentery in much the same way that paregoric (tincture of opium) is used to cure diarrhea today
- 17th century the Dutch introduced tobacco smoking and in Formosa began to mix tobacco with opium in their pipes as a treatment for malaria
- soon the tobacco disappeared from the mixture and they inhaled vapors from heated balls of latex
- opium smoking became so popular that Chinese officials sought to ban the sale of the drug
  - –these edicts were ignored by the Chinese populace and British and Portuguese suppliers

In 1729, the Chinese imperial government, alarmed at its debilitating effect, prohibited the sale of opium mixed with tobacco and banned opium-smoking houses.

- Selling opium for smoking was classed with robbery and instigation to murder, and punished with banishment or death

This didn't stop Britain, which had gradually been taking over the opium trade from its European capitalist rivals, Portugal and Holland.

- Much of the opium at this time was grown and manufactured in British India. It produced so much opium that it served all the countries in India with that commodity.
- Importation of opium was forbidden in England

Britain gets monopoly on opium trade

The English East India Company, as is well known, obtained, besides the political rule in India, the exclusive monopoly of the tea-trade, as well as of the Chinese trade in general, and of the transport of goods to and from Europe. The monopolies included:

- salt
- opium
- betel

While the Chinese government was taking stronger and stronger measures to end the opium trade, the British were doing all they could to increase it.

Opium Wars

Britain's East India Company would wage three wars on the people of China in order to secure the right to sell opium there.

- These wars for imperialist plunder and to open up new markets determined the fate of Hong Kong.
- They were the world's first drug wars. Their sole purpose was to secure the importation of an addictive substance that provided a bountiful flow of profits.

Opium sales had risen gradually from 2,330 chests in 1788 to 4,968 chests in 1810. Each chest held about 150 lbs. of purified opium. But once the British got a monopoly, they forced it up to 17,257 chests in 1835, worth millions of British pounds.

The Opium War of 1839-42

- started when the Chinese imperial government confronted foreign merchant ships and demanded they surrender their illegal cargo.
- Capt. Elliot, superintendent of the British fleet, asked the governor-general of India for as many ships as he could spare.
- He sent them to Hong Kong, where they protected the opium-carrying merchant vessels.
- Chinese junks sent by the emperor didn't stand a chance against the British warships.
- The wars waged on the Chinese people caused untold deaths and casualties. The British destroyed, plundered, looted and raped their way along the coast of China.
- The plunder ceased only when there was nothing to take or destroy."

Negotiations led to the "Treaty of the Bogue.

- But the pact failed when the Chinese refused to pay the British for opium lost in the war.

The British then seized Amoy, Tinghai, Chunhai and Ningpo.

After the deaths of thousands of Chinese, the first Opium War ended on Aug. 29, 1842, with the Treaty of Nanking.

The treaty forced the Chinese government to pay $15 million to the British merchants. Furthermore, it opened up five ports to English trade.

Finally, the Chinese government ceded Hong Kong to the British.

This was the bloody origin of Hong Kong's 155 years as a British colony. It paralleled imperialist conquest in Africa, Latin America, the Middle East and the rest of Asia--a heritage that in the 20th century has brought both great misery and great revolutionary movements for national liberation.

Laudanum

Opium was not common in Europe until 1525 when Paracelsus rediscovered a way to dissolve opium in alcohol.

- could be consumed easily
- the medical benefits made it the most popular drug of its time

Morphine

1803 morphine, a purified alkaloid, was isolated from opium.

- could be given in measured doses
- 10 times as strong as opium (which contains at least 24 alkaloids and numerous other compounds
- when the hypodermic syringe was developed in 1853 it provided a rapid method of controlling pain, and morphine use rose
- morphines effectiveness was both a blessing and a curse
- originally touted as nonaddicting
- 45,000 soldiers returned home from the Civil War addicted to morphine

Heroin

Heroin was developed as a nonaddicting painkiller from chemically altered morphine

- originally described as lacking addicting qualities (the name means heroic)
- 1889 Bayer Co. marketed in cough syrup

Soon became apparent that heroin was even more dangerous than morphine

- crossed cell membranes more rapidly
- must be administered more frequently
- users suffer from disruption of blood flow, infections, hepatitis and collapsed blood veins

Heroin is physically addicting

- 2-3 weeks of injecting 30 mg/day has been shown to create a habit