

## WITCHCRAFT

In medieval times, there were two types of witches:

1. Malefic—a witch that caused misfortunes such as causing beer or cheese to spoil, the family cow to dry up to causing the death of babies.
2. Theological—where the witches made a covenant with the Devil and that is how they acquired their magical powers. It was common for these types of witches to be marked with a “witches mark” such as an extra nipple from which familiars of the Devil could nurse.

### Salem witchcraft affair of 1692

The number of people accused and executed made it the worst outbreak of witch persecution in American history. It affected not only Salem Village but eight other communities of Essex County, Massachusetts and Connecticut.

### HISTORICAL DETECTION

This was the subject of scores of books and the "witch" problem had been approached from a variety of disciplines. And many explanations were provided for the cause.

Pattern of Symptoms--patterns of symptoms distributed in a nonrandom way in space and time.

### Geography of the trials in U.S. And Europe

Scotland--witch persecution was concentrated in the northeast, along the coast, the country's main rye-growing area.

Early Modern Europe-- a large proportion of trials were concentrated in alpine areas of France and central Europe in the Rhine Valley:

In all these areas rye was the staple cereal.

The absence of persecution is also significant-- there were few witch trials in Ireland. The Irish at this time consumed mainly dairy products, potatoes and oats, which may explain why they were not very susceptible to “bewitchment.”

Food prices were indicative--the higher the rye prices the more witch persecution trials were held.

Climate was indicative--the colder the spring and summer temperatures, the more witch persecution trials were held.

Outbreaks of witchcraft were often accompanied by outbreaks of central nervous system symptoms, tremors, anesthetics, paresthesias (sensations of pricking, biting, ants crawling on the skin), distortions of the face and eyes, paralysis, spasms, convulsive seizures, muscle contractions, hallucinations, manias, panics, depressions.

There were also a significant number of gangrene cases and complaints of reproductive dysfunction, especially agalactia (inability of a nursing mother to produce enough milk).

Animals behaved wildly and made strange noises. Cows had agalactia (lack of milk production).

1670 a French physician, Dr. Thuillier put forth the concept that it was not an infectious disease, but one that was due to the consumption of rye infected with ergot that was responsible for the outbreaks of St. Anthony's Fire.

In 1976 psychologist Linnda Caporael proposed that those who displayed symptoms of bewitchment in 1692 were actually suffering from ergotism.

## ERGOT AND ERGOTISM

Is a disease of cereals, especially rye (*Secale* sp.) and occasionally other grasses.

It is caused by the fungus *Claviceps purpurea*.

When ingested by humans or animals in sufficient quantity, ergot produces a disease called “ergotism” which has in serious cases, two variants:

1. convulsive--convulsive ergotism might better be labeled “dystonic ergotism”. It is characterized by nervous dysfunction, such as writhing, tremors, and wry neck, which in the past were frequently reported as “convulsions” or “fits.”
2. gangrenous--victims of gangrenous ergotism may lose fingers, toes, and limbs to dry gangrene, caused by a vasoconstrictive chemical (such as the alkaloid ergotamine) produced by the ergot fungus.

The symptoms are caused by a number of potent alkaloids in the fungus.

## ST. ANTHONY’S FIRE

- The symptoms (but not the cause of the symptoms) were well documented during the Middle Ages.
- It was at this time that it came to be called Holy Fire and later St. Anthony’s Fire. Holy Fire because it caused burning sensations at the extremities from gangrenous ergotism, and St. Anthony’s fire because hospitals were set up, which were dedicated to Saint Anthony, to take care of patients with the disease.

## MANY MEDICINAL USES FOR THE ALKALOIDS DERIVED FROM ERGOT

Epidemics of gangrenous necrosis of the extremities and central nervous aberrations swept through the populations of Europe from the ninth through the eighteenth centuries as a result of incorporating ergot-contaminated flour into bread.

Medical use of ergot in obstetrics began in China 5000 years ago and reportedly was prescribed by Hippocrates (ca. 400 B.C.)

## CURRENT USES

Dihydroergotoxine (Ergoloid Mesylate)--increases brain metabolism and cerebral brain flow. Used in age related mental capacity decline.

Ergonovine maleate--when used after placental delivery, ergonovine increases the strength, duration and frequency of uterine contractions and decreases uterine bleeding. Used in the prevention and treatment of postpartum and postabortal hemorrhage.

Ergotamine derivatives--to prevent or abort vascular headaches such as migraine, migraine variant and cluster headache; suppress fertility or stop lactation.

LSD--treatment of certain mental disorders.

Albert Hofmann--inventor of LSD at Sandoz labs in Switzerland--1930’s

Isolated an alkaloid called ergotoxine, which was thought not to be pure, but a mixture.

- Isolated Lysergic acid as one of the base alkaloids.
- combined lysergic acid with a variety of amines to make pharmaceutically important compounds.

•the twenty-fifth substance in this series of lysergic acid derivatives: lysergic acid diethylamide (LSD-25, Lyserg-saure-diathylamid). This compound, from its structure, was planned as a circulatory and respiratory stimulant. In tests it was found that a strong effect on the uterus was established that amounted to 70% of ergonovine. It was also noted in passing that the experimental animals became restless during the narcosis. LSD-25 initially aroused no special interest and testing was discontinued.