Ergot—A Blessing and a Scourge

Ergot, the black mass of a particular fungus on cereal grains, especially rye, was the cause of frightful epidemics in Europe more than a thousand years ago, and the ingested contaminated grain has occasioned disease in Russia as late as 1927 and in the United States a generation earlier. Medicinally administered, however, it provides a very important drug in the science of obstetrics.

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Introduction

The drug Ergot consists of the dried sclerotium of *Claviceps purpurea* (Fries) Tulasne developed on the inflorescence of rye (*Secale cereale* L.) plants. To those mothers who have benefitted during child birth from the oxytocic effects produced by the alkaloidal constituents of Ergot there is perhaps the greatest admiration for the development and growth of this potent fungus sclerotium. But to men and women who in earlier times suffered from "Ergot disease", the result of eating cereal grains which were badly contaminated with ergot, the word has signified pain and death. Since the 6th century the cry "ergotism" has caused fear and need for precautions in gathering grain crops. Farmers whose fields have become infested with the fungus know of the damage it will cause to crops. Thus, this drug fungus during the advent of man's use of plants for food and medicine has played both a useful and a destructive role.

History

Pharmacopoeias and Dispensatories of many countries have long specified that the official drug Ergot must consist of the dried sclerotium of *Claviceps pur-...purea* (Fries) Tulasne developed on rye plants of *Secale cereale* L. The synonyms commonly assigned to the drug, such as "Ergot of Rye", "Spurred Rye", "Secale cornutum", "Horn seed" and "Mutterkorn", have resulted from the descriptive characters of the commercial rye ergot. Upon the introduction of ergot into official medicine which took place in the United States early in the 19th century there appeared in the "Medical Repository of New York" (1808) an "account of the Pulvis parturiens remedy for quickening child-birth". Further, this early description stated, "It is a vegetable and appears to be a spurious growth of rye. Rye which grows in a low wet ground yields it in greatest abundance". The great impetus to the use of rye as a source for the drug undoubtedly gained headway with the publication of a "Dissertation on the natural history and medicinal effects of *Secale cornutum*, or ergot" by Oliver Prescott and presented before the annual meeting of the Massachusetts Medical Society in 1813. This was later published in other languages. It was among the first United States publications which aroused interest universally in the obstetrical use of the fungus. Adam Lonicer's "Kreuterbuch" of 1582 and the reports of Paulizky in 1787 had indicated at an earlier period
that the drug was used by the midwives of Europe, especially in Germany. With the aroused interest in the medicinal qualities of ergot of rye, focus was first placed upon the rye as the host plant for all medicinal preparations of the drug. In 1816, however, Jacob Bigelow, a medical botanist of Boston, made reference to the fact that the rye plant is not alone a source for ergot fungus infestation. In his publication "On the Clavus, or Ergot of Rye" Dr. Bigelow mentioned that wheat plants are infected similarly and that "considerable quantities of that ergot as well as domestic rye ergot have been offered for sale at the druggists’ stores". This presumably would indicate that early during the 19th century the use of other than rye ergot was made by physicians and that shortly following the aroused interest in the drug much of the domestic supply was already established.

Although the knowledge concerning ergot and its medicinal virtues has been rapidly accumulated since the early 19th century, mention should be made of the significance of ergot and ergotized host plants to the ancients and to people of intermediate time, from 500 A.D. to 1800 A.D. Accounts vary considerably and are limited in regard to the early medicinal importance of ergotized grains. Schelenz and Achundow (1) reported that ergotized grains were used by the Chinese midwifery at an early date. Mention is made of its use similarly by Arabian medicine. There are evidences among the records of the Moorish physician, Avicenna, which indicate that the fungus was used medically during the 10th century.

The greatest historical significance of ergot and ergotized grains up to the 20th century has been the disease ergotism accompanying ergot-infected foods. This disease proved to be fatal to thousands during the endemic and pandemic plagues of Europe and Russia during the 10th, 11th and 12th centuries when the peasant class ingested ergotized grains. The disease was characterized by a gangrene development in the limbs of the victim due to the severe vasoconstriction and pressor actions of the ergot alkaloids. Such an action would eventually result in a numbness of the appendages, shrinkage and finally separation and dropping off. According to the description in the "Annales Xantenses" of 857 A.D., "a great plague of swollen blisters consumed the people by a loathsome rot, so that their limbs were loosened and fell off before death". The great ergot plagues of the middle ages, which were known as "Holy Fire", "St. Anthony’s Fire", "St. Martial’s Fire", the "ignius Beatae Virginis invisibilis or infernalis", were all associated with ergotized grains of the rye. Wahlin (2), who reported in 1765 on similar epidemics in the provinces of Jonkoping, Westergotland, Kronoberg, and Carlskrona, Sweden, has attributed the cause of the disease in these areas to ergotized barley and oats.

Kobert in 1889 made a study of the use of ergot among Greek and Roman times. He found substantial evidence for the fact that a true ergotism did exist among populations during the periods of Hippocrates, Dioscorides and Galen. This is interesting because of the general belief that rye plants were not commonly grown by the ancient Greeks and Romans. If this disease were true ergotism and not the result of the similar physiological action caused by eating corn darnel, black wheat or other smuts and rusts, it would indicate that ergot from cereals other than rye, perhaps fodder grasses, were of significance during Greek and Roman times.

Among the latest reports of ergotism from the ingestion of contaminated cereal grains are those concerning an outbreak of the disease in the States of New York, Ohio, Iowa and Kansas from