“The COCKLE of Rebellion, Insolence, Sedition"...

The Corncockle

The 17th century audiences who heard these words of Shakespeare's Coriolanus are unlikely to have missed the significance of the botanical metaphor. How many modern theatre-goers would appreciate this allusion to the corncockle, a once pernicious weed of cornfields? In the context of Act 3, Scene 1 of the play, at which point Coriolanus and the senators of Rome argue about a free gift of corn to the people, the metaphor is an apt one. The gift is likened to the nourishing of the ..."*cockle... which we ourselves have plough'd for, sow'd, and scattered*"... and which Coriolanus claims will incite *'rebellion, insolence, sedition'* amongst the common people.

Why is the power of this imagery lost today? Most of us have probably never seen corncockle (*Agrostemma githago* L) except in illustrated Floras; yet from the Roman period until the present century, this plant was widespread as a weed of cultivation throughout N.W. Europe. Records have been made from many Roman and medieval sites in Britain, both rural and urban, although corncockle probably first arrived here with Iron Age farmers. Modern county Floras refer to it as having once been abundant but now rare or extinct, and this is the case for Yorkshire, too. Thus Baines’ Flora of Yorkshire (1840) notes that it was a troublesome weed in cornfields, and Lees' Flora of West Yorkshire (1888) records it as being common in the lower lands (the western side of the Vale of York).

Corncockle is a handsome tall-growing pink-flowered relative of the campions, pinks and ragged robin and, together with poppies, cornflower and corn marigold, would have made cornfields a riot of colour in summer. It has fallen victim to the necessary evil of farming with herbicides and clean seed grain, though there are good grounds for being happy that this is so. The seeds of corncokle are amongst the largest of any cornfield weed (about 3-5mm diameter) and not much smaller than cereal grains, so they difficult to separate by sieving. Moreover, the flower heads stand at much the same height as the ears and they are

easily harvested together. This, in itself, might be no serious problem, were it not that the seeds render the flour discoloured, and bread baked from it unpalatable. Worst of all they contain a poisonous *sapotoxin, githagenin*. This, together with the knowledge that corncockle seeds are regularly recorded from archaeological deposits, indicates how important this plant must have been to our forebears, whether they recognized its effects or not.

The connexion between food contaminated with corncockle seeds and health was discussed as long ago as 1961 by Prof. Sir Harry Godwin and K. Bachem in the earliest report on plant remains from archaeological excavations in York. In their appendix to K.M. Richardson's account of Anglo-Saxon deposits in Hungate, they noted that corncockle seeds were frequent in sarnpes from 'late Anglo-Saxon' layers and that such seeds when ground into flour might have increased susceptibility to leprosy, a disease common in the Middles Ages.

Two other authors have written more extensively on corncockle as a food contaminant. In 1975 Gay Wilson published a list of plant remains from a late 13th/ early 14th century cesspit in Chester, amongst which she found a number plants that had evidently passed through the human gut, including abundant fragments of corncockle seeds. Her account draws on a variety of modern and ancient writers, one of whom, the 17th century herbalist Gerarde, is quoted thus: ...*'what hurt it (cockle) doth among come, the spoyle unto bread, as well as in colour, taste, and wholesomeness'... is better knowne than desired'*... Karl-Heinz Knorzer, too, delved into the literature for his account of corncockle as a food poison, prompted by the records he had made of corncockle seeds from many sites of Roman to medieval date In the Rhineland of West Germany. He wondered whether the effects of corncockle poisoning might not have been rather similar to those of ergot, a disease of rye caused by the fungus Claviceps purpurea. This pathogen has a well documented and fascinating history, as the cause of ergostism (St Antony's Fire or Holy Fire). The disease, which was particularly prevalent in medieval France (the last known epidemic was in Lorraine and Burgundy in 1816, though sporadic cases still occur) takes two forms: convulsive and gangrenous. Interestingly, the fungus is a source of the synthetic

hallucinogen LSD and ergot drugs in midwifery since the 16th century for inducing contractions of the uterus in childbirth; more recently, ergotamine has been used in the treatment of migraines. Gay Wilson remarks that the seeds of corncockle have likewise found a place in modern pharmacopoeia for their diuretic, expectorant and anti-helminthic properties, though she rightly points out that modern uses do not necessarily reflect historic ones.

To return to Knorzer: his search of the late 19th century medical literature revealed an important work by Kruskal, who appears to have made a detailed study of the effects of poisoning on animal tissues. In a series of trials, he subjected frog heart to a 0.1 solution of githagenin and found that although it was at first stimulated to work harder, prolonged exposure resulted in an irregular beat and eventually lesions appeared. Further experiments, involving feeding the poison to a variety of live animals showed that only small doses were necessary to bring about death and Kruskal's list of trial animals is impressive, to say the least — horses, calves, cows, goats, pigs, dogs, cats, rabbits, hens, pigeons, canaries, rats, tapeworms and maw-worms! As an example, as little as 1 gramme of ground cockleseed per kilo of body weight was all that was necessary to produce symptoms of poisoning in pig.

Kruskal also reviewed reports of corncockle poisoning in man, and in particular cited one case in France, where autopsy showed the cause of death to have been consumption of cockle-rich bread. Contaminated grain coffee has also been blamed for cases of poisoning, indicating that even roasting does not destroy the poisonous principle. Some authorities claim, however, that slow cooking, such as in the preparation of 'porridge', more effectively removes the poison.

Experiments by Lehmann and Mori, towards the end of the last century, showed that 3-5 grammes of powdered cockle seed was enough to bring about mild intoxication in man — the first symptoms of poisoning were nausea, belching, headache, dyspepsia, and unpleasant taste in the mouth, a tickle in the throat, hoarseness and coughing, with increased mucous secretion. Stronger doses led to dizziness, restlessness, delirium and

eventually convulsions and injury to the circulatory system. By this time, doctors were sufficiently aware of the dangers of corncockle poisoning to make recommendations to the authorities, and Kruskal appears to have prompted the Director of the Pharmacological Institute of Russia to advise the regulation of the amount of contamination permitted in flour for consumption by the Russian army; the soldiers had previously been exposed to doses as large as 6 grammes a day, which should have been enough to induce at least the first symptoms of poisoning.

But what of corncockle in the past history of York? Godwin and Bachem's findings have been borne out by all subsequent investigations of archaeological deposits where conditions of preservation have afforded us the chance to look at plant remains. Corncockle is repeatedly recorded, often in some quantity, from charred and waterlogged deposits of Roman, Anglo-Scandinavian and medieval date. Finds of particular relevance to the food contamination problem have been of corncockle seed fragments in cesspit deposits. Together with cereal bran, parasite ova (see Andrew Jones' account in Interim vol 6 no 4) and cereal pollen, they form a very characteristic suite of fossil remains, often fused together into concreted lumps One 11th century pit fill from 16-22 Coppergate yielded as much as 4 by volume of corncockle seed amongst the bran and other weed seed debris, though it is difficult to tell what proportion this formed of the bread (or perhaps 'porridge') from which it undoubtedly came. To judge from the results obtained so far, these observations are likely to be reported for each of the many cesspits excavated on York sites, and they tell of widespread consumption in the past of a harmful food contaminant. There can be little doubt of the damage that must have been caused to the bodies of those who ate cockle-bread, though it is interesting to note a possibly beneficial side-effect - the anti-helmintic properties of githagenin may well have exercised some control on the parasites infesting the guts of these unfortunates!

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