

Shakespeare, plants, and chemical analysis of early 17th century clay 'tobacco' pipes from Europe

AUTHOR:
Francis Thackeray¹

AFFILIATION:
¹Evolutionary Studies Institute,
University of the Witwatersrand,
Johannesburg, South Africa

CORRESPONDENCE TO:
Francis Thackeray

EMAIL:
Francis.Thackeray@wits.ac.za

POSTAL ADDRESS:
Evolutionary Studies Institute,
Private Bag 3, Wits 2050,
South Africa

KEYWORDS:
Walter Raleigh; Francis Drake;
botany; cannabis; cocaine;
tobacco

HOW TO CITE:
Thackeray F. Shakespeare,
plants, and chemical analysis
of early 17th century clay
'tobacco' pipes from Europe.
S Afr J Sci. 2015;111(7/8), Art.
#a0115, 2 pages. <http://dx.doi.org/10.17159/sajs.2015/a0115>

In a recent issue of *Country Life*, Mark Griffiths¹ renews interest in John Gerard's *Herbal*², published in 1597 as a botanical book which includes engraved images of several people in the frontispiece. One of them (cited as 'The Fourth Man') is identified by Griffiths as William Shakespeare, but this identification is by no means certain. The question arises as to whether the engraving represents Sir Francis Drake.³ Gerard's *Herbal* refers inter alia to various kinds of 'tobacco' introduced to Europe by Drake and Sir Walter Raleigh in the days of Shakespeare in Elizabethan England. One can well imagine the scenario in which Shakespeare performed his plays in the court of Queen Elizabeth, in the company of Drake, Raleigh and others who smoked clay pipes filled with 'tobacco'. However, there were several kinds of 'tobacco' in those days, as indicated in this article.

There clearly is a strong link between Drake and plants from the New World, including corn, the potato and 'tobacco'. Furthermore, one can certainly associate Sir Walter Raleigh with the introduction of 'tobacco' to Europe from North America (notably in the context of the tobacco plant called *Nicotiana*, from Virginia and elsewhere, and from which we get nicotine).

Thackeray et al.⁴ reported in the *South African Journal of Science* the results of chemical analyses of plant residues in 'tobacco pipes' from Stratford-upon-Avon and environs, dating to the early 17th century. This non-destructive chemical analysis was undertaken using state-of-the-art forensic technology at the South African Police narcotics laboratory, by three scientists (Professor Francis Thackeray, Professor Nicholas van der Merwe of the University of Cape Town, and Inspector Tommy van der Merwe). A sophisticated technique called gas chromatography mass spectrometry (GCMS) was used. The pipe bowls and stems had been obtained by Thackeray on loan from the Shakespeare Birthplace Trust in Stratford-upon-Avon. Several of the pipes had been excavated from the garden of William Shakespeare.

Results of this study (including 24 pipe fragments) indicated *Cannabis* in eight samples, nicotine (from tobacco leaves of the kind associated with Raleigh) in at least one sample, and (in two samples) definite evidence for Peruvian cocaine from coca leaves of the kind which Thackeray et al.⁴ associated with Drake who had himself been to Peru before 1597.

Gerard² has a whole section dedicated to kinds of tobacco including 'the henbane of Peru' which can be associated with cocaine (*Erythroxylum*), recognising that Sir Francis Drake could have brought coca leaves to England after his visit to Peru in South America, just as Sir Walter Raleigh had brought 'tobacco leaves' (*Nicotiana*) from Virginia in North America.

In 2000, Thackeray consulted the first edition of Gerard's *Herbal* in Stratford-upon-Avon to check the description of various kinds of 'tobacco'. As a botanist, Gerard must have known of the coca leaf as a kind of 'tobacco' from Peru. As chemists, Thackeray et al.⁴ found unquestionable evidence for the smoking of coca leaves in early 17th century England, based on chemical evidence from two pipes in the Stratford-upon-Avon area. Neither of the pipes came from the garden of Shakespeare. Four of the pipes with *Cannabis* came from Shakespeare's garden.

Shakespeare may have been aware of the deleterious effects of cocaine as a strange compound. Thackeray (unpublished manuscript) suggests that Shakespeare preferred *Cannabis* as a stimulant which had mind-stimulating properties. These suggestions are based on the following literary indications. In Sonnet 76 Shakespeare writes about 'invention in a noted weed'. This can be interpreted to mean that Shakespeare was willing to use 'weed' (*Cannabis* as a kind of tobacco) for creative writing ('invention'). In the same sonnet it appears that he would prefer not to be associated with 'compounds strange', which can be interpreted, at least potentially, to mean 'strange drugs' (possibly cocaine). Sonnet 76 may relate to complex wordplay relating in part to drugs (compounds and 'weed'), and in part to a style of writing, associated with clothing ('weeds') and literary compounds (words combined to form one, as in the case of the word 'Philsides' from Philip Sidney). The so-called 'Fourth Man' depicted on the frontispiece of Gerard's *Herbal* holds a fritillary plant in one hand and corn in the other, as identified by Griffiths¹ who claims that the man is Shakespeare. However, attention can be given to an alternative hypothesis that this individual represents Sir Francis Drake.³ We support the view that the 'Fourth Man' in Gerard's *Herbal* may represent Drake (especially as he holds an ear of corn in one hand – why should Shakespeare be holding such a plant of a kind known to have been introduced to Europe by Drake?).

An appeal is made to the Shakespearean community to give attention to articles that were published more than a decade ago⁵⁻¹² and which were largely criticised by Shakespearean scholars at that time. Chemical analyses of residues in early 17th century clay 'tobacco pipes' have confirmed that a diversity of plants were smoked in Europe. Literary analyses and chemical science can be mutually beneficial, bringing the arts and the sciences together in an effort to better understand Shakespeare and his contemporaries.

Acknowledgements

I thank the Shakespeare Birthplace Trust for the opportunity to analyse residues from pipes from the garden of Shakespeare and elsewhere in the environs of Stratford-upon-Avon.

References

1. Griffiths M. Shakespeare: Cracking the code. *Country Life*. 2015; Special Historic Edition May 20;120–138.
2. Gerard J. *The herbal or general history of plants*. London: John Norton; 1597.
3. Ward M, Lee GF. The language of flowers speaks clearly, not in riddles [homepage on the Internet]. c2015 [cited 2015 Jun 19]. Available from: <http://www.historyneedsyou.com/blog/the-language-of-flowers-speaks-clearly-not-in-riddles>
4. Thackeray JF, Van der Merwe NJ, Van der Merwe TA. Chemical analysis of residues from seventeenth century clay pipes from Stratford-upon-Avon and environs. *S Afr J Sci*. 2001;97:19–21.
5. Thackeray JF. The tenth muse: Hemp as a source of inspiration for Shakespearean literature? *Occasional Paper of the Shakespeare Society of Southern Africa*. 1999;1–9.
6. Thackeray JF. Shakespeare, hallucinogens and a tenth muse [homepage on the Internet]. c2001 [cited 2015 Jun 19]. <http://www.teachernet.co.za/shakespeare1.html>
7. Thackeray JF. Shakespeare, smoking and a substance 'more chargeable than cane-tobacco' [homepage on the Internet]. c2001 [cited 2015 Jun 19]. Available from: <http://www.teachernet.co.za/shakespeare6.html>
8. Thackeray JF. Cannabis, appetite and Shakespearean texts [homepage on the Internet]. c2001 [cited 2015 Jun 19]. Available from: <http://www.teachernet.co.za/shakespeare2.html>
9. Thackeray JF. Shakespeare's sonnets and sources of inspiration [homepage on the Internet]. c2001 [cited 2015 Jun 19]. Available from: <http://www.teachernet.co.za/shakespeare3.html>
10. Thackeray JF. Portraits of Shakespeare [homepage on the Internet]. c2001 [cited 2015 Jun 19]. Available from: <http://www.teachernet.co.za/shakespeare4.html>
11. Thackeray JF. The dedication to Shakespeare's sonnets [homepage on the Internet]. c2001 [cited 2015 Jun 19]. Available from: <http://www.teachernet.co.za/shakespeare5.html>
12. Thackeray JF. Trance, art and literature: Testing for hallucinogens. *Antiquity*. 2005;79:303. Available from: <http://antiquity.ac.uk/projgall/thackeray/>

