

Ecology and environmental studies are modern sciences, but the problems with which they deal are by no means new. This article, the first of a three-part series on environmental issues in the Roman world, examines the problem of air pollution. Later instalments will investigate deforestation and waste management.

By careful study of the literary and archaeological evidence we can recreate many of the sights and sounds of ancient Rome; but to recapture the smells is beyond our capability and desire. Despite the building of drains and sewers, sanitation was primitive. Despite the existence of public baths, such sources as Catullus, Petronius, Martial, Suetonius and Juvenal repeatedly complain about persons with foul-smelling bodies and their futile attempts to disguise them with musks and perfumes which smelled even worse. The stink of boiling cabbage, or of garbage and animal droppings on the sun-fried cobblestones, must have been noxious. From the tannery came the pungent smell of urine in which animal hides were trodden and softened. From the dyer's shop came the noisome odour of purple tint, diluted with water and urine, which caused Martial to classify purple (a necessary adornment of senatorial and equestrian togas) among the worst-smelling of all substances. To combat these odours, matrons used to sniff a small ball of fragrant amber. Cicero reports that the notorious governor Verres used to carry a bag of roses and wear a garland of roses round his neck to mask the stench of the streets.

A more insidious problem, not overcome by nosegays, was smoke. Fires were necessary for home cooking and

heating as well as industrial use. Public baths had large wood-furnaces which must have generated plenty of eye-watering smoke. More recent examples illustrate the seriousness of the problem. Queen Eleanor of England had to move from Nottingham in 1257 because of the insufferable smoke. The "London ivy" or clinging smog of the British capital provoked John Evelyn's 1661 tract, Fumifugium, or the Inconvenience of the Aer and Smoake of London Dissipated. This was mostly coal smoke, but the situation is little better with wood. A 1984 CBC news report revealed that Whitehorse in the Yukon, where 70% of the houses are heated by wood fires, has worse air pollution than Los Angeles. What then of the Roman world?

"Cease wondering at the smoke and wealth and noise of blessed Rome," says Horace (Ode 3.29). Every Roman home must have smelled of burning carbon. Neither the drying-out of the wood nor preliminary charring could eliminate the fumes. "How easily," says Lucretius, "the heavy fumes and smell of charcoal creep into the brain." St. John Chrysostom describes the house of a poor man as having walls covered with soot. In larger homes there were fires in the hearth, in the kitchen, on the altar of the household gods, and in the private baths. Without the modern conveniences of chimneys and fans, smoke drifted through the house. The impluvium or square opening in the roof of the atrium allowed the venting of smoke from the hearth, and kitchens were often built adjacent to the open-air peristyle court. These openings allowed the fumes to escape from the house, but fed smoke into the atmosphere. In the banquet halls

of the wealthy the air would be rank with the smell of charcoal, cooked foods, and lamp fumes.

The public baths were an even greater menace. Valerius Maximus tells us that Hannibal persuaded the inhabitants of Nuceria to abandon their city, then suffocated them with smoke and steam from the baths. Likewise the firing of bricks and similar products in industrial kilns generated heavy wood smoke. The Caesarian charter of Urso in southern Spain (no doubt similar to regulations in many other towns) limited the size of pottery and tile kilns within the city limits, the implication being that larger factories must be situated out of town. Similarly no one was allowed to build a crematorium (whose smoke and the smell of burning flesh would have been intolerable) within half a mile of the town.

In the streets, your eyes and nose

would smart from the smoke of cooking: the thermopolium or hot-drink stand (Romans liked their wine warm), the sidewalk vendors of various fried or roasted snacks, the homeless lighting their cheap charcoal braziers on the pavement. Or consider the street scene described by Juvenal, in which a throng of clients collect their free meal from the patron, bringing along a slave with a portable charcoal heater to keep the food warm on the way home: "Don't you see how much smoke issues from that crowd getting their handout? A hundred guests, each followed by his own kitchen-boy. Corbulo himself [a Neronian general famed for his strength] could hardly bear so many heavy vessels and other equipment which the poor little slave must balance on his head, running to fan the flames." These and other activities contributed to the polluted, malodorous atmosphere of the Eternal City in its heyday.