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There's a Bug in my Media: Insects, Colonial Archives and Book History*

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Abstract

Traditionally a 'dry' discipline little concerned with ecocritical themes, book history has started to engage with environmental humanities in a more sustained way. This paper joins this trend by considering insects in colonial archives. Starting with the insects themselves, the paper considers state responses of fumigation, and what this means for definitions of books and literary genres. Situated at the intersection of insect, paper and chemicals, the article raises larger questions of entomo-politics, chemical legacies in museums and archives, and the intertwined histories of empire, war, insecticide and genocide.

Keywords

Bookworms; insects in archives; insects and book history; Herman Charles Bosman; Westminster Hall.

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The in-tray of the Cape government entomologist not infrequently resembled an insectarium. Exasperated gardeners and worried householders posted bugs, dead and alive, in envelopes, tins, matchboxes, and bottles, seeking remedies for their ruined carnations and vermiculated floors.[1] One morning in February 1910 in Cape Town, two flasks of insects arrived, dispatched by the Attorney General's office where they had been discovered in the records of the Registrar of Deeds. The state's entomologist, Charles Lounsbury, was quick to recognise the creatures as the paste beetle, or more properly *Sitodrepa paniceum* (today *Stegobium paniceum*). Their 'ravages in stored volumes of records' were well-known to Lounsbury and 'have been the theme of many memoranda from this Office during the past fourteen years'.[2]

Over those fourteen years, an array of arthropods in both their larval and adult forms had taken up residence in collections of government documents and the shelves that housed them.[3] These included furniture beetles, biscuit beetles, paste beetles, fish moths, cockroaches, white ants, book lice, and weevils, known collectively and misleadingly as 'bookworms'. These creatures had in turn been assailed by a range of chemicals in powder, aerosol, liquid and gaseous form: corrosive sublimate, carbon bisulphide, sulphuric acid, methyl bromide, cyanide of potassium, hydrocyanic acid, paraffin oil, naphthalene and so on.[4] These fumigations, sprayings and sprinklings had met with mixed success, and reports of insects, plus the insects themselves, continued to make their way to the in-tray of the government entomologist.

While miniature in scale, this intersection of insect, paper and chemicals has prompted scholars to explore larger themes. Through following the trails of white ants, Rohan Deb Roy has discussed the entomopolitics of the imperial state.[5] Other researchers have traced the chemical legacies in museum and archival collections and their implications for the restitution of objects.[6] Related themes include the imperial formation of entomology, largely shaped in 'the tropics', and the intertwined histories of war, insecticide and genocide.[7]

Print culture and book history suggest further productive angles, especially as regards the ecology of texts. Traditionally a 'dry' discipline little concerned with ecocritical themes, book history has started to engage with environmental humanities in a more sustained way. Joshua Calhoun, an early modernist, explores paper-

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1 Beetles Public Coleoptera, SAB, CEN 1093, SF 74/1, 1949–1959; Fish Moth Public, SAB, CEN 1093, SF 77/1, 1932–1945; Weevils General, SAB, CEN 1103, SF 240/1, 1938–1944.

2 Under Sec of Agriculture to Sec of the Law Dept , 5/2/1910, Extermination of the Paste Beetle (Sitodrepa panacea), KAB, AGR 629, T197, 1907–1910.

3 Anobium in SG Records, KAB, LND 1/717, L11454, 1898–1901; Bestryding van Insekte, SAB, ARH 181, 25/4, 1959–1961; Extermination of the Paste Beetle (Sitodrepa panacea), KAB, AGR 629, T197, 1907–1910; Poisoned Paste and Eradication of Paste Beetle from Archives, UOD 99,Z32/12, 1912–1916; Re: Extermination of the Paste Beetle in Records, KAB, T 1184, 2498, 1909; Damage Done by the Paste Beetle, KAB, AGR 456, 3439, 1901; Extermination of the Paste Beetle in Records, KAB, AG 1872, 19387, 1909–1910.

4 Official Correspondence. Fumigation of Documents in the Archives, KAB, CAD 1/1/1, 5, 1912.

5 R. D. Roy, 'White Ants, Empire, and Entomo-politics in South Asia,' *The Historical Journal* 63, 2, March 2020, 411–36, https://doi.org/10.1017/S0018246X19000281.

6 T. R. Bangstad, 'Pollution and Permanence: Museum Repair in Toxic Worlds', *Museums & Social Issues*, 15, 1–2, July 3, 2021, 13–27, https://doi.org/10.1080/15596893.2022.2083356; T. Bangstad, 'Toxic Heritage: Coal Tar, Care and Chemical Intimacies in Museum Housekeeping', *Journal of Contemporary Archaeology* 9, 1, September 20, 2022), 121–38, https://doi.org/10.1558/jca.21609.

7 J. F. M. Clark, *Bugs and the Victorians* (New Haven: Yale University Press, 2009); F. A. von Hippel, *The Chemical Age: How Chemists Fought Famine and Disease, Killed Millions, and Changed Our Relationship with the Earth* (Chicago, IL: University of Chicago Press, 2020), https://press.uchicago.edu/ucp/books/book/chicago/C/bo49298855.html.

making and the organic nature of the page, asking: 'How has human communication been altered by the corruptibility of the nonhuman matter used to make texts?' As Calhoun indicates, modern readers, and scholars in particular, seldom recognise 'the plants, animals and minerals in their media', thanks to chemicals, electricity and air-conditioning that keep documents in a state of suspended decay.[8]

By contrast, the case of the paste beetle draws attention to the nonhuman matter in texts and processes of decay. Leather and cloth bindings, starch paste, animal glues, cellulose-based paper and cardboard, as well as mould, all offered opportunities for larval and in some cases adult feeding of 'stack pests'. Archivists had to scrutinise their volumes, attending to different kinds of bindings and paper, with reports from the Antilles and Calcutta indicating that the 'cosmopolitan book-maggot' favoured red bindings and chose French paper over English.[9]

These latter discussions cohered under the rubric of 'books in the tropics', where enemies of the codex were deemed to be plentiful. As self-appointed custodian of 'the book', the colonial state was ever keen to defend its volumes against such enemies. In 1920, the government printers of Uganda produced an official handbook which carried a slip indicating that the solution used for binding would 'render the work impervious to the ravages of insects'.[10] In similar vein, the Bureau of Printing for the Government of the Philippines experimented with different glues and bindings, inserting printed slips into their publications, asking users to write back, reporting on the condition of the binding and the state of the book generally.[11]

We tend to think of books as reasonably resilient objects, but in 'the tropics', the codex became a vulnerable object that required chemical armour to survive. In 1869 German book manufacturers recommended that volumes 'exported to the tropics should be protected from insect attack by the application of alum and corrosive sublimate and a shirting [book-binding gauze] should be applied to the still wet poison lacquer'.[12]

In 'the tropics', the organic substrate of the book came to the fore and, as we shall see, supported a number of unusual and unexpected definitions of the book. In setting out this story, we begin with insects in archives, then examine state-driven chemical responses to them. This encounter of paper, insect and chemical produced a view of books, documents and archives as types of mutant plants. From the perspective of insects, archives represented concentrations of cellulose, but of an odd kind that lacked the forms of self-defence that most plants possess against herbivores. Entomologists who generally oversaw fumigation in archives approached their task as they normally did, that is, as if it were a matter of insect control in plants, the archives constituting a type of failed mono-crop in need of pesticide.

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8 J. Calhoun, *The Nature of the Page: Poetry, Papermaking, and the Ecology of Texts in Renaissance England* (Philadelphia: University of Pennsylvania Press, 2019). The online edition used has no page numbers.

9 'Preservation of Books in the Tropics', *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)* 1894, 91 (1894): 217–18, https://doi.org/10.2307/4118211; H. B. Weiss and R. H. Carruthers, *Insect Enemies of Books* (New York: New York Public Library, 1937), 34.

10 'Uganda Handbook', *East African Chronicle*, December 18 1920, 3.

11 'Hints on Bookbinding for the Tropics', *British and Colonial Bookbinder and Stationer (Bookbinding Edition)*, May 9, 1912, 48.

12 Weiss and Carruthers, *Insect Enemies of Books*, 34.

The latter part of this article explores how the intersection of insect, paper and chemicals relates to literary form and questions of book history. I explore these themes through a discussion of two 'texts'. The first is a South African short story by Herman Charles Bosman, 'White Ant'; the second arises from pieces of worm-eaten and fumigated wood from Westminster Hall that were distributed to museums across the dominions in the early twentieth century.

Insects in archives

While the insect community in any archive was varied, one could always be assured of finding members of the family *Anobiidae* (borers), who went by a range of colloquial names in different parts of the world: biscuit beetle, drug store beetle, tobacco beetle, bread beetle and in the Cape archives, paste beetle. As these names suggest, these food opportunists have been inhabiting human provisions for millennia and today are generally discussed under the category of 'stored product insects'.[13] Following this logic, we might refer to them as 'stored book insects', a niche they have been occupying ever since codexes, manuscripts, books and paper have been around.

Stored books offer an ideal habitat for borers: concentrations of cellulose and protein in a dark, quiet, and in some instances, temperature-controlled environment, largely free of predators. Most 'bookworms' probably arrived through already inhabited volumes, although some must have located their own biblio-habitats using skills of semio-chemical detection and colour recognition (possibly explaining the often-noted popularity of red bindings). Adult females deposit eggs on, or in the volumes and the paper-eating larvae burrow minute tunnels into the volume, producing the tiny 'shot-hole' effect that one often encounters in old books. Under ideal temperature and humidity conditions, the larvae spend one to two months in their books, before pupating, after which the adults emerge. With a life span of two to three weeks, the adults fly (or possibly stroll) to the next suitable volume, before eggs are again oviposited.

As Emma Solberg in her wonderful article 'Human and Insect Bookworms' indicates, bibliovores treat books like habitats, akin to a log, burrowing in its outer perimeter: 'Conveniently for us, bookworms prefer the exteriors and the edges of books to the interior or the center. They tend to make their tunnels, holes, and burrows in the covers, gutters, and margins.'[14]

Yet, in treating books like plants, insects must have considered them as rather sad specimens of vegetation, unable to produce any of their own defences. Most plants and trees have a range of protective mechanisms against herbivorous insects (or at least those with which they have co-evolved). These include 'alarm' chemicals that alert other plants to danger or can attract predators; compounds which disrupt insect metabolism; mechanical adaptations like closing on touch (and hence dislodging the

13 R. Plarre, 'Stored Products as Habitats', in *Encyclopedia of Insects* (Amsterdam: Academic Press, 2009), 967-70.
14 E. M. Solberg, 'Human and Insect Bookworms', *Postmedieval* 11, 1, March, 2020, 20, https://doi.org/10.1057/s41280-020-00162-z.

bug); and resin to force out borers. Without any of these, books must have resembled failed plants, a concentration of cellulose unable to defend itself in any way.

This physical presence of insects was not the only mode in which insects occupied archives. A goodly percentage of files of the entomology department are arranged around particular species, so that the insect itself shapes bureaucratic categories. Files also contain drawings and photographs of insects. Since many of the prophylactic strategies used such as naphthalene, creosote, shellac, and paraffin oil were strongly scented, archival staff and users must have been constantly reminded of the presence of insects by these odours. Another reminder came with fumigation when all or parts of the archive were closed.

Archivists and insects

Chemical fumigation in the Cape archives arrived at more or less the same time as its use in two other locales: firstly, orchards and vineyards, and secondly, Cape Town harbour. Like pesticides in many parts of the world, those on the fruit trees and vines of the Western Cape were the product of US expertise and experimentation. Leading the local charge was Charles Lounsbury, the first government entomologist, who was appointed in 1895. He was a 23-year-old fresh out of the Amherst Agricultural College and Experimental Station. Like his mentors, Lounsbury was a great proponent of pesticides, seeing them as a necessary technology that could make farming in South Africa modern.[15] The second site, Cape Town harbour, like most imperial ports, had been carrying out sulphuric fumigation of ships since the 1880s and in 1895 extended fumigation to the dockside, adding a plant fumigator, and in 1901, a steam disinfector.

As with many life forms in the Cape colony, the fate of the insects in the archives was shaped by capitalist agriculture, on the one hand, and colonial maritime border-making, on the other. There are of course myriad other factors one could list, but for the moment, let's stick with these two, since it was the state departments associated with them which advised the archives on how to address their insect problem. The first, and most frequently called upon, was the entomological division; the second, the immigration department (which along with the port health officer oversaw fumigation). The ways in which insects encountered chemicals in the archives were hence offshoots of the fumigation practices and protocols of these two divisions.

Lounsbury's department defined its mission as 'economic entomology' with a major focus on 'injurious' insects that affected those plants and crops (and their produce) of interest to humans. The recommendations that entomologists made to archivists were informed by their experience of dealing with insect infestations in plants and stored goods. In proposing the use of methyl bromide in archives, a report, probably from the 1920s, spoke only of its effectiveness in relation to eradicating insects on plants and in stored food, not archive settings. After noting the chemical's

15 C. P. Lounsbury, 'The Pioneer Period of Economic Entomology in South Africa', *Journal of the Entomological Society of Southern Africa* 3, 1, September 1940, 9–29, https://doi.org/10.10520/AJA00128789_2400; K. Brown, 'Political Entomology: The Insectile Challenge to Agricultural Development in the Cape Colony, 1895-1910', *Journal of Southern African Studies* 29, 2, June 1, 2003, 529–49, https://doi.org/10.1080/03057070306203.

'properties of penetration which make possible the destruction of certain sheltered pests such as leaf miners, borers, mites and other internal feeders', the report praises the ability of methyl bromide to disinfest quarantined produce and plants, whether imported Christmas trees, narcissus bulbs, green coffee beans, or dehydrated soups. A section, 'Plant Reactions', indicates that 'in general, living plant material is unaffected by ordinary doses of methyl bromide, although any plant can be injured by overdosages or careless attention to detail'.[16]

How paper might react to the compound was never broached, although some archivists, like WJ Fockens from Pretoria, did point out that some 'remedies' adversely affected paper and ink.[17] Most archivists, however, deferred to the entomologists, following their advice or that which came from the museum herbarium (whose original source would in any event have been the entomology division).[18] The Kew Herbarium was also a respected authority.[19] In the 1940s, archival documents were fumigated at the Entomological and Plant Quarantine Station in Rosebank, Cape Town, a practice that further reinforced the link of document and plant.[20] For entomologists, the archives were subsumed into the logic of insect control in plants – archives were implicitly a species of herbarium, their documents and volumes like so many closely-packed leaves.

Whereas the entomologists saw the archives as a type of mono-crop in need of pesticide, the immigration department approached the problem from a framework of contaminated ships and cargo. From this perspective, the insects may have seemed like miniature rats running riot; the volumes like infested blankets or second-hand clothing in need of disinfection. The port authorities had long seen books as slightly suspect objects, containers of dangerous foreign ideas and vectors of contamination, intellectual rather than bacterial, but contaminants, nonetheless.[21] Left to his own devices, the chief immigration officer would probably have ordered the infected archival volumes burned in the 'destructor' (as furnaces were known). Schooled in maritime fumigation, immigration officers were wedded to sulphuric forms of disinfection for ships; steam disinfection for cargo and luggage; and, as indicated, where all else failed, disposal in the 'destructor'. These techniques did not map well onto the archive and, when consulted for advice, immigration officials were at a loss, seeking guidance from the Public Works Department (PWD) or from other archivists. Their shaky purchase on the situation emerges from a letter sent by the chief immigration officer to the PWD asking what 'drugs' would be required for the fumigation.[22] This lack of finesse and scientific glamour, compared to the entomologists, probably increased immigration officials' sense that the infested books, and indeed much of the archive, was best burned.

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16 Official Correspondence. Fumigation of Documents in the Archives, KAB, SAB, 2/1/1/2, C1/5–C2/6/1, 1913.
17 Official Correspondence: Eradication of Paste Beetle, KAB, CAD 1/1/1, 5, 1912.
18 Poisoned Paste and Eradication of Paste Beetle from Archives, SAB, UOD 99, Z32/12, 1912–1916.
19 Anobium in SG Records, KAB, LND 1/717, L11454, 1898–1901.
20 Housing, Cape Archives: Fumigation of Records (1944-1953), 2/1/1/2, C1/31, KAB, CAD.
21 Isabel Hofmeyr, *Dockside Reading: Hydrocolonialism and the Custom House* (Durham: Duke University Press, 2022), https://ebookcentral.proquest.com/lib/nyulibrary-ebooks/detail.action?docID=6798668.
22 Official Correspondence: Eradication of Paste Beetle, KAB, CAD 1/1/1, 5, 1912.

Such ham-handedness was further augmented by international shifts in fumigation technologies. Since the 1880s, maritime fumigation techniques had been sulphur-based, but from the early 1900s, cyanide-based methods gained the upper hand.[23] First used in the Californian citrus industry in the 1880s, these latter systems involved derivatives of hydrocyanic gas and were actively promoted by Lounsbury. As such methods took hold, a variety of commercial applications of hydrocyanic gas as a pesticide were developed – most notoriously Zyklon B, which was to become a genocidal instrument of the Nazi regime.[24] Patented in Germany in 1923, the compound was actively marketed as a pesticide in several regions of the world, including South Africa, where it was used until the 1950s.[25] The German company Degesch, which held the patent for Zyklon B, had acquired a controlling interest in the Durban-based South African Fumigation Company, until the company was seized as enemy property with the advent of World War II.[26]

Insects, literature and book history

Thus far we have given an historical account of insects, paper and chemicals in a South African context. What literary implications might we draw from these intersections? One route into this topic is an observation from Emma Solberg, who notes: 'Wormholes, in short, have been understood as damage, as that which gets in the way of reading, not as something to be read."[27] What might such a reading of wormholes look like? This section experiments with this question through a discussion of two 'texts' – one a short story, the other a piece of wood.

Herman Charles Bosman's 'White Ant'

Herman Charles Bosman (1905–1951) is probably best known for his Marico stories, a series of satirical sketches of the 'backveld Boers' among whom Bosman had worked as a schoolteacher in the 1920s. The story that concerns us here, 'White Ant', unfolds in Jurie Steyn's post office, a forum where white men gather to converse, and in this instance, share stories of the termite.[28] The story opens with Steyn wiping down the post office counter with paraffin oil while in the background his wife uses Cooper's Dip against the pest. While this chemical prophylaxis continues, the men congregate and start swopping white ant stories. The first comes from the schoolmaster who is reading Eugene Marais' *The Soul of the White Ant* and is about to launch on a disquisition. Fearing a long lecture, At Naude intervenes, observing that this isn't the first time white ants have been found in the post office, since the last lot of stamps he

23 L. Engelmann, *Sulphuric Utopias: A History of Maritime Fumigation* (Cambridge, Massachusetts: The MIT Press, 2019).
24 Hippel, *The Chemical Age*.
25 Peter Hayes, *From Cooperation to Complicity: Degussa in the Third Reich* (Cambridge: Cambridge University Press, 2004), https://doi.org/10.1017/CBO9780511550805.
26 South African Fumigation Co (Pty) Ltd (Degesch) Sale of Assets, (1940-1953), SAB, BE, 648 W19/15Q.
27 Solberg, 'Human and Insect Bookworms', 19.
28 Herman Charles Bosman, 'White Ant', in *The Collected Works of Herman Charles Bosman*, vol. 2 (Johannesburg: Southern Books, n.d.), 283–87.

bought 'had little holes eaten all round the edges'.[29] Jurie Steyn puts him right, telling him these holes are called perforations and are required by law.

The next termite vignette also revolves around a stamp (incidentally of a springbok) which in this instance has been eaten by white ants. The injured stamp had been used by a young girl writing to the Sunshine Children's Club of a church magazine in Cape Town. Her letter attracts a condescending response from the editor, who has noticed the damaged stamp, and on the basis of this has assumed that the sender must live in the 'lonely African wilds' or the 'gramadoelas'. The young correspondent immediately loses interest in the Sunshine Club since the editor makes her world sound 'so uncivilized … as though we're living in a grass hut with a string of crocodiles around it, with their teeth showing'.[30]

The schoolmaster who has been reading Eugene Marais' *The Soul of the White Ant* again takes the floor, noting that 'the termite was the greatest plague of tropic lands'. This observation causes a ripple of anxiety in the gathering, which insists that the Marico is not in the tropics. 'Loose talk about wilds and gramadoelas and tropics', they observe, has given the region a bad name. Undaunted, the schoolteacher again seizes the floor, and in a long speech drawn from Marais' text indicates that the white ant is 'really very highly civilized' and, except for haemoglobin, carries the same blood in its veins as 'a White man'. This statement precipitates further anxiety, with one interlocutor noting that if one made allowances for the termite, 'the next thing the white ant would want would be to vote'.[31]

Feeling that the 'talk had taken a wrong turn', an old-timer, Oupa Bekker, retails a story from his early days as a transport rider about an encounter with white ants.[32] On one expedition, the wooden leg of his companion, as well as the entire wagon, are infiltrated by termites. With the next breeze, both the leg and wagon evaporate in a cloud of powdery dust. 'White Ant' ends with the teacher being asked to explain what the best remedy for the pest is. Marais' book contains this information, he says, but as he left the book at school over a weekend, the ants have eaten the relevant chapter.

For our purposes, the story is especially useful as it focuses so closely on worm-holes, or rather, ant-made holes whether in stamps, ox-wagons, or scientific texts. The setting of the post office and the focus on stamps points to insects as omnipresent, both materially and ideologically in the mediums and channels of human communication and circulation. The ants not only shape, or re-shape the material forms of paper, they also inform larger categories of discourse, invoking the spectre of 'the tropics', debates about 'civilisation', or the classificatory systems of science. The story deploys the termites as a cipher that haunts Boer/white settler society and renders brittle the assumptions underlying its racialised social order. These are revealed as hollow, easily reduced to frass, the fine powdery refuse produced by boring insects (or the excrement of insect larvae). Even chemicals seem a poor defence against the

29 Bosman, *Collected Works*, 283.
30 Bosman, Collected Works, 284, 285.
31 Bosman, Collected Works, 285, 286.
32 Bosman, Collected Works, 286.

relentless white-ant onslaught. Or as one observer notes, 'by the time you saw those little tunnels' it was too late, even for the paraffin oil or Cooper's Dip.[33]

Asked what Marais' book advocated for the destruction of termites, the schoolmaster admits that he had left his copy on his desk at school over the weekend. Returning on Monday, he finds that the final chapter 'dealing with how to exterminate the white ant had been eaten away'. The last chapter of *The Soul of the White Ant* in fact tells a story about how Marais hears that the Pretoria Town Council is attempting to fumigate a house that had long been plagued by termites, though workers can't locate the queen's cell. He offers to do this for them in return for two to three days grace in which he can observe the queen. His allotted time is soon up; the queen is removed 'and after that the activities and life of the nest ceased for good'. In eating the last chapter, the white ants create a story without end in which human vanities, whether of chemicals or narrative forms which posit an imagined closure, are rendered useless.[34]

A wooden text

In September 1919, the Governor General of South Africa received a letter from Downing Street informing him that 'His Majesty's Government have for disposal a limited quantity of decayed oak which has been removed from the trusses in the roof of Westminster Hall'. The letter suggested that 'the principal Museums in the Union' might be interested in receiving the pieces of wood as a gift and went on to explain that 'this oak is part of the original timbers of the time of Richard II'. As matters turned out, four museums (in Cape Town, Pretoria, Bloemfontein and Durban) requested pieces of the oak, asking that these be no more than three feet in length to make them suitable for exhibition. Freight costs were to be covered from the museums' own funds.[35]

What the letter from Downing Street failed to say was that the pieces of oak were worm-eaten and toxic, having been removed as part of a major fumigation exercise of Westminster Hall in 1917. Built in the 11th century, the Hall forms part of the parliamentary estate and has been held up as a stage for the 'pagaentry' of English history. On her death, Queen Elizabeth II (like all previous deceased monarchs) lay in state in the Hall which has been the setting for momentous trials like that of Guy Fawkes or Charles I. Its wide hammer-beam roof, built in the 14th century and constructed from oak from the forests of southern England, had long been regarded as an architectural wonder. However, the roof had been plagued by the larvae of the deathwatch beetle and by 1917 was in danger of collapse. In the midst of war, saving the roof became a matter of national importance, with the fumigation of the structure portrayed as

33 Bosman, Collected Works, 285.
34 Bosman, Collected Works, 287. Eugene N Marais, *The Soul of the White Ant* (New York: Dodd, Mead & Company, 1937), 180. My thanks to Carrol Clarkson for this point.
35 Education: Museums. Decayed Oak from Trusses in Roof of Westminster Hall: Offer of Pieces Of, SAB, GG 1144, 25/300, 25/305, 1919.

a miniature enactment of the battlefront where 'the enemy' would be destroyed by chemical warfare.[36]

The person chosen to oversee this campaign was Harold Maxwell Lefroy (1877-1924), Professor of Economic Entomology at Imperial College, honorary curator of insects at the London Zoo and founder of Rentokil. Lefroy had done his apprenticeship in the Department of Agriculture in British India and had popularised pesticide use in his *Indian Insect Pests* (1906).[37] Using a toxic insecticide comprising tetrachlorethane, trichlorethalene, cedar wood oil, paraffin wax, and solvent soap,[38] the professor led a team of gas-masked workers whose fumigation caused 'dead beetles [to shower] down onto the floor of Westminster Hall like black rain'.[39]

Sections of trusses had to be removed and replaced and bits of the discarded timber were displayed in London where the press described them as looking 'like piece[s] of old sponge'.[40] This visible evidence of beetle activity drew attention both to the threat the insects had posed to this jewel of English heritage and to the power of the chemicals to vanquish them. The bits of oak sent to South Africa (and other dominions) were similarly vermiculated – and toxic. Despatched to the dominions, they acted as signifiers of the British empire, ancient in its historical reach yet modern in its chemical efficiency. Using an insecticide shaped in colonial India and in the trenches of World War I, the fumigation project enacted the marvels of the chemical empire. The toxic detritus of English history is magnanimously conferred on the white dominions who not only gratefully receive it but use their own resources for its transport. We might regard these bits of decayed oak as so much imperial frass, produced initially by beetles but then scattered across the dominions, remnants of an already-decaying empire, and now granted chemical afterlives in the dominions.

Conclusion

Let us return in conclusion to Solberg's question of how to read the wormholes. As she indicates, these are generally read as damage. She suggests instead that we might think of insects and humans as co-readers and co-writers. Yet, one can't help wondering whether this rather benign view arises from the excellent preservation conditions of wealthy libraries and archives in the global north where permanent electricity and plentiful resources enable damage to be kept to a minimum. As we all know, these are not the conditions prevailing in archives of the global south. How then do we read postcolonial wormholes, assuming of course that one can even get access to the document in the first place?

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36 H. Cescinsky and E. R. Gribble, 'Westminster Hall and Its Roof', *The Burlington Magazine for Connoisseurs* 40, 227, 1922, 76–84; G.L. Courthope, 'A Note on the Oak Timber Used in the Roof of Westminster Hall', *Empire Forestry Journal* 1, 2, 1922, 214–15; S. Lonsdale, 'Death from Above', *History Today*, December, 2022, 16-18, accessed March 25, 2023, https://www.historytoday.com/archive/history-matters/death-above.

37 'Harold Maxwell Lefroy (1877-1925)', accessed March 25, 2023, https://risweb.st-andrews.ac.uk/portal/en/researchoutput/harold-maxwell-lefroy-18771925(ac6f086b-8e58-4ebe-b586-e93f06b3f790).html.

38 F. Baines, 'Westminster Hall', *Empire Forestry Journal*, 1, 2, 1922, 212.

39 Lonsdale, 'Death from Above', 18.

40 Lonsdale, 'Death from Above', 18.

This article has suggested that one way would be to read the wormholes along with their chemical traces. Such an approach points to the shaping presence of imperial and colonial institutions that propagated the chemicals and how these interact and intersect with the organic material and creatures present in paper. The Bosman story and the Westminster Hall wood provide useful framing for these themes. On the one hand, the worm-eaten wood points to the grandiose notions of the chemical empire, while on the other, the Bosman story debunks this hubris through the persistent termite which endlessly undermines such human fantasies of closure and clear endings. In the archives themselves, this intersection of paper, insect and chemical points us towards unexpected definition of the book and the archive as a type of failed plant. Reading wormholes from a postcolonial perspective has a lot to offer.