For this Sunday, December 15, 2019, theToday's Issues group will discuss two articles from the December 5 issue of the New York Review of Books

Page 19, David Quammen, "Suckers," a review of The Mosquito: A Human History of our Deadliest Predator

Page 27 Lindsey Hilsum, "Women's Business," a review of several books about woman and children held in prison camps after their husbands/fathers were killed as ISIS members.

The group meets in the parlor of the Religious Education Building next to the church at 9:30 on Sunday mornings. Please take a look at the readings and join our lively discussion, all are welcome. Of special interest to anyone who has been stung by a mosquito

Women's Business can be read on the NYR site without a password, click on the title agove. A copy of "Sluckers" follows:

Suckers
David QuammenDECEMBER 5, 2019 ISSUE
The Mosquito: A Human History of Our Deadliest Predator
by Timothy C. Winegard
Dutton, 485 pp., $28.00
A poster for a US public health campaign urging precautions against malaria, circa 1920
US National Library of Medicine
A poster for a US public health campaign urging precautions against malaria, circa 1920
If Alexander the Great hadn't died of malaria in the sumpy outskirts of Babylon, on his way westward toward Arabia and North Africa (and Gibraltar and Europe?) in 323 BCE, the Western world and its history might look much different. That's just a mote of what you'll learn from Timothy C. Winegard's The Mosquito: A Human History of Our Deadliest Predator.

If the Visigoth king Alaric hadn't succumbed to malarial fever in the autumn of 410 CE, after sacking the city of Rome but not gaining control of Italy, who knows? If the Holy Roman Emperor Otto II hadn't croaked suddenly at age twenty-eight of the same inescapable ailment, just short of consolidating the Germanic tribes in 983, maybe Voltaire would have grown up speaking German. If Oliver Cromwell hadn't suffered malaria (plus some compounding ailments, possibly kidney stones or typhoid fever) unto death in 1658, because he was too stubbornly Puritan to take quinine, a remedy associated with Jesuits, then what? No Stuart restoration, possibly no more British monarchy ever? And if Dante hadn't died of what Winegard calls "malaria's inferno fevers" in 1321, and likewise Lord Byron in 1824, the former might have lived long enough to return to Florence forgiven, while the latter might have beat the Ottomans and become king of Greece—King George Gordon I—or anyway, with the additional output of those two, The Norton Anthology of Poetry would be even longer. "The history-altering possibilities here are boundless," Winegard muses, expressing the central idea of his book.

Those individual deaths, of Alexander and Cromwell and the many other “great men” undone by small insects, are only a sampling of the consequential what-ifs regarding mosquitoes and the diseases they carry. Whole armies have been devastated, whole battles decided, whole wars and kingdoms lost, whole societies transformed, because “the mosquito,” as Winegard puts it, “has ambushed humankind with unmitigated fury since time immemorial and scratched her indelible mark on the modern world order.” Did he say “her”? Yes, he personalizes all mosquitoes with the feminine pronoun, because only the females suck blood—for protein and other nutrients necessary to their developing eggs—and therefore it’s they who spread disease. For Winegard, as for H. Rider Haggard, the daunting protagonist is She. Of course, mosquito populations don’t exist or reproduce without males too, but never mind.

Over the length of his millennia-spanning chapters, Winegard argues that the Hellenistic world, the Roman Empire’s rise and fall, the Crusades, the Mongol conquests of Genghis Khan, the European colonization of the Americas, the enslavement of Africans, the coalescence of Great Britain, the American Revolution, the formative collision between the United States and Mexico in the 1840s, the American Civil War, and World War II, especially as fought in the Pacific theater and Italy, can’t be properly understood without recognition of the critical role of mosquitoes. Even the siege of Vicksburg should be seen in these terms: Grant’s army had plenty of quinine for treating and preventing malaria, while Confederate soldiers and citizens stuck inside the city did not.

Mosquitoes weren’t everywhere, but where they were, they counted, and crucial features of soggy landscape, such as the Mississippi River bottomlands below Vicksburg’s high bluffs, or the Pontine Marshes southeast of Rome, could serve as strategic bulwarks because they were defended by these implacable insects. Well into the time of Otto II, Winegard writes, the Pontine Marshes “continued to protect Rome and the Vatican from foreign invasion during the conflicts of this era, as they had done in the past against swarms of Carthaginians, Visigoths, Huns, and Vandals.” Those attackers, unlike Grant in 1863, had no extract of cinchona bark, unknown in Europe as an antimalarial agent until after Columbus. Henry IV (the king of the Germans in the eleventh century, not the later English version) also foundered in malaria season on the outskirts of Rome, Winegard notes.

This author is a former officer in the Canadian and British armed forces who studied history at Oxford, has published previous books on military history, and knows his battles well—Actium to Yorktown, Antietam to Waterloo, Anzio to Zama. He knows, further, how mosquitoes may have deployed themselves in each case. His new work is imposing in scope and martial in tone, as its opening sentence announces: “We are at war with the mosquito.”

Winegard nicknames the enemy “General Anopheles,” because Anopheles is the genus containing those mosquitoes that transmit human malaria—most notably Anopheles gambiae, carrier of falciparum malaria, the deadliest kind. “The Peloponnesian War and General Anopheles put a harsh, abrupt end to the golden age of Greece.” This is broad-brush history, for people who like heroes and villains and big, easy metaphors. But mosquitoes aren’t warriors,

nor are they predators upon humans, not in any true ecological sense, notwithstanding Winegard's subtitle. (During their immature stage, in water, some mosquito larvae attack and eat other mosquito larvae—real predators.) A few kinds don't even drink blood, not even the females, ever. Let's get this straight: the most troublesome mosquitoes for humans, such as members of the Anopheles group or the species Aedes aegypti, are vectors, not predators. That means the females inadvertently take in, carry, and deliver disease-causing microbes of various sorts in the course of their biting activity. Otherwise both sexes feed on nectar and other plant juices.

But the predator trope is important to Winegard's enterprise, which involves not only showing that mosquitoes have brought immeasurable harm to humans (quite right) and served as major determinants of human history (case well made), but also melodramatizing his material with suggestions that they have done it—she has done it, that demon female—intentionally and fiendishly. "She has no purpose other than to propagate her species and perhaps to kill humans," he writes. "If I didn't know better, I would say she is satisfying her sadistic and narcissistic impulses at our expense." He does know better, but mentions it anyway.

Winegard doesn't need such hyperbole, because the facts and the numbers are dramatic enough. He makes the astonishing point that, by one calculation (I wish he said whose), mosquito-borne diseases have accounted for almost half of all deaths in human history: "In plain numbers, the mosquito has dispatched an estimated 52 billion people from a total of 108 billion throughout our relatively brief 200,000-year existence." To be more precise, malaria-causing parasites of the genus Plasmodium, plus viruses such as the ones responsible for yellow fever and dengue and chikungunya, plus other mosquito-transmitted pathogens such as filarial worms, have done that killing. So yes, mosquitoes have much to answer for, just as enablers of these killer bugs.

Winegard is generous to his predecessors in this field, of which there are many, some quite distinguished. Hans Zinsser published Rats, Lice and History back in 1935, and though his topic was epidemic typhus—a disease caused by bacteria and whose vector is lice—not malaria or any of the other mosquito-borne illnesses, his book was seminal. Like malaria, typhus killed a lot of soldiers and shaped a lot of history, as Zinsser's urbanely conversational narrative made clear. Alfred W. Crosby's The Columbian Exchange came in 1972, discussing the biological as well as cultural consequences of 1492. Malaria went west to the Americas, tobacco returned east to Europe, and many other transfers occurred, some (probably including syphilis, also west to east) almost as grimly consequential. After that, Crosby's Ecological Imperialism (1986) applied a similar vision more broadly, to Europe's age of colonies.

In the meantime had appeared William H. McNeill's classic Plagues and Peoples (1976), an epidemiological chronicle of the world, and it might be said that Crosby and McNeill together launched the field of modern disease history. In 1978 Gordon Harrison published his ecologically well-informed Mosquitoes, Malaria and Man. Other books touching on malarial history followed, including Randall M. Packard's The Making of a Tropical Disease (2007);

James L.A. Webb Jr.'s Humanity's Burden: A Global History of Malaria (2009); one by McNeill's own son, J. R. McNeill, Mosquito Empires (2010); and Charles C. Mann's 1493 (2011). Winegard draws on them all, quotes from them abundantly, and acknowledges them graciously.

But all this overlapping treatment raises two questions. How many books on mosquitoes and human history does a reader need? And, if the answer to that is somewhat less than a dozen, what does each offer that might recommend it above the others? The answer to question 2, in Winegard's case, isn't crisp writing, understated persuasion, or biology.

A reader can forgive Winegard all the jaunty pop-culture allusions, the bad puns, the unnecessary footnotes, the overheated compound adjectives ("mosquito-haunted shadows" of the Roman Empire, "mosquito-doomed" colonists at Darien), and the proclivity toward repeated clichés (coffee "went viral" when first imported to England, bubonic plague "went viral" in the fourteenth century, the book Silent Spring "went viral" in 1962, and even influenza managed to "go viral" in 1919, though it was already a virus), because his voice is amiable and his subject is huge. His book is charmingly ambitious. More disappointing than the small infelicities is his choice to neglect, almost entirely, the scientific dimension of mosquitoes.

Aedes aegypti, a carrier for yellow fever, Zika, and dengue, among other viruses
Dietmar Heinz/Picture Press/Redux
Aedes aegypti, a carrier for yellow fever, Zika, and dengue, among other viruses
This shows first in his annoying reluctance to distinguish between a species and a genus, pretty basic stuff, and his refusal to call mosquito species by the scientific names—Anopheles gambiae, Aedes aegypti, etc.—that allow them to be accurately categorized, identified, and distinguished. If you're afraid that your frail readers will blanch at a few Latinate binomials, why assume that they will tolerate footnotes? Following from that blurriness is the dearth of biology and ecology. The relationship between humans and mosquitoes, on the landscapes they share, is not a kind of warfare, after all, but an ecological matter: two forms of life, interacting with each other, with landscape, with other creatures too, their interests often at cross-purposes. And ecological insight is built, bit by bit, from the natural history of particular creatures. These traits distinguish the dangerous Anopheles gambiae from the harmless Toxorhynchites brevipalpis, drinker of honeydew; those traits remind us that Aedes aegypti transmits yellow fever but not malaria. Alfred Crosby and Gordon Harrison recognized such information as critical, but Winegard mostly ignores it.

His book suggests, in fact, that he's not much interested in mosquitoes. He's not much interested in telling one kind from another. He's not much interested in Plasmodium falciparum, the malarial parasite that travels in female Anopheles mosquitoes and has caused most of those millions, those billions, of human deaths. Plasmodium falciparum has one of the most elaborate life-history cycles of any organism on planet Earth—to be technical, it's a protist, a single-celled eukaryotic organism, much more complex than a bacterium or a virus, though tiny—with vast consequences for humanity; but Winegard dismisses it with a paragraph that ends, "Malaria is a remarkable example of evolutionary adaptation." Yes, and so how did this intricate microbe

happen to evolve? What are its origins among similar parasites infecting other creatures, more anciently evolved than humans—gorillas, for instance? Why does it pass through both a sexual stage (in the mosquito gut) and then an asexual stage (in human blood)? Why does it sojourn in the human liver? Why does its presence make people sick but leave mosquitoes (as far as we know) healthy? Not interested.

He's apparently not interested either in the great family of mosquitoes, known as Culicidae, containing roughly 3,500 species, of which only a few—mainly within the genus Anopheles and the genus Aedes, to the exclusion of 110 other mosquito genera—transmit the severe human diseases. Why have they diversified so broadly? Why do some transmit human diseases and so many do not? Is there an adaptive advantage for the mosquito, to be carrying a bug that sickens humans, or a disadvantage? Evolutionary biology might have something to say. And why is it that scientists have long since devised a vaccine against the yellow fever virus, but no durably effective vaccine against Plasmodium falciparum? Microbiology and molecular biology might have something to say. These are intriguing and potentially consequential scientific mysteries, which Winegard doesn't choose to tackle. His interests are military and political history, sketched with General Anopheles as bugbear. We're supposed to grant an author his choice of subject, but from a book titled The Mosquito we might expect more illumination of mosquitoes.

Forty years ago, I read a little volume with the same title but a different subtitle: The Mosquito: Its Life, Activities, and Impact on Human Affairs by J. D. Gillett. As the subtitle indicates, it considered the animal itself, not just its silhouette on the world stage. It offered some wondrous revelations. I learned that adult females of that gentle genus Toxorhynchites, which are big and spindly like daddy longlegs spiders, feed only on carbohydrates, never on blood, and that the absence of protein in their adult diet is offset by what they earlier consumed as hefty, aggressive larvae, preying on other mosquito larvae. I learned that individuals of Aedes nigripes, in northern Canada, play an important part in pollinating arctic orchids. I read of the Italian folk belief that if you sleep with a pig in your bedroom, you'll escape malaria, possibly because the pig's higher body temperature will attract the Anopheles mosquitoes in preference to you. And I learned that Anopheles coustani is common in African swamps but seldom if ever transmits malaria, unlike its notorious cousins Anopheles gambiae and Anopheles funestus, because it generally doesn't care to bite humans. What's that about?

Gillett was no mosquito apologist. He was a professional entomologist who had worked in the Uganda Medical Department and at the Virus Research Institute (still an important facility, in Entebbe), especially on yellow fever, and his book contained chapters on the impact of disease and mosquitoes on human history. But it also delivered a well-informed, non-Manichean picture of mosquito variousness and the complexities of their interactions with the world, including us.

Still, Winegard's The Mosquito is a rich trove of information—encyclopedic, in fact, telling us many things that we don't know and many others that we already do. ("Plato is considered the most pivotal figure in the development of Western philosophy and science.") But after all its treetop-level surveying of ancient history and old military campaigns, it comes down to ground

level and more fully to life around the point where Benito Mussolini decides to drain those Pontine Marshes. This was a populist development project begun in 1929, Winegard writes, “when the life expectancy of a farmer in Italy’s malarial regions was a dismal 22.5 years.” Canals and dikes were built, pump stations helped suck out the water, a million pine trees were planted, and propaganda as well as health benefits accrued, as Il Duce himself sometimes posed shirtless on the scene with a shovel.

But after Mussolini fell, in autumn 1943, and the Allies landed at Anzio, Hitler’s commander in the theater (or maybe Hitler himself) gave an order to open the dikes and let the water and the mosquitoes return to the marshes. It was, Winegard notes, “a textbook example of biological warfare.” Malarial deaths in the region rose from thirty-three in 1939 to 55,000 in 1944. That presumably included not just marsh-dwelling Italians but also Allied troops, by then present along Italy’s southwest coast, who had begun fighting their way toward Rome.

One of those soldiers was Sergeant Walter “Rex” Raney, an American GI who would eventually be Timothy Winegard’s wife’s grandfather. In late 1943, along with others of the 45th Infantry Division, Raney came ashore at Salerno, moved north during the new year, then dug in, hunkering along the Mussolini Canal and tormented more by the “blasted mosquitoes”—to hear him tell it later, as Winegard did—than by the German shelling. He caught malaria and was treated, one among 45,000 febrile American soldiers, recovering enough to be pulled out in June 1944, with his unit, and transferred to the more urgent battlefront in France. He fought east through the Battle of the Bulge and then, on April 29, 1945, participated in the liberation of Dachau, where the Nazi doctor Claus Schilling had been performing malarial experiments on prisoners. “That was a dark day,” Raney told his granddaughter’s husband, and didn’t say much more about it. At the camp, he caught another dose of malaria, from what Winegard evocatively calls “an experimental Nazi mosquito.” Sergeant Raney survived the disease, and the war, but many of Schilling’s test subjects—along with those millions of other camp inmates—did not. Schilling was hanged, after his trial before a US military tribunal, in 1946. Mosquitoes, they endured.

This is good history, grainy and potent. Likewise the book’s final chapters, which cover modern developments, newly recognized mosquito-borne diseases such as West Nile fever and Zika, and finally a bit of science. Winegard describes the DDT-based Global Malaria Eradication Programme of the World Health Organization, begun in 1955, costly and toxic, and how after fourteen years it failed. (I would have welcomed some insight into why it failed.) He sketches the efforts of the Bill and Melinda Gates Foundation against malaria and the poverty that exacerbates it, using tools and methods far more astute than DDT. He reminds us that 85 percent of malaria cases occur in sub-Saharan Africa, where 55 percent of the population lives on less than a dollar a day, and that many of the fatalities are children. He reports that mosquito-borne illnesses last year killed 830,000 people. He gives us an inkling of how the new methodology of gene editing, CRISPR, could be used to create “gene drives”—runaway propagations of artificially inserted genes—that might carry certain mosquito species or disease agents to extinction.

Is that a wonderful prospect, or a dangerous form of presumption, or maybe both? To his credit, Winegard raises the question. “For better or for worse,” he says of mosquitoes and humans, “our destinies and interactive histories have been forever entwined, trapped in a single story of struggle and survival with ultimately the same outcome.” Same outcome? I assume he means stalemate, over and over. “We would be naïve to think that we can effortlessly and without a catch disentangle them now.” That’s the first axiom of ecological wisdom.

It’s worth remembering another ecological principle: density-dependent effects. One of the reasons that mosquito-borne diseases have killed 52 billion people over the course of human history, and most of that toll in recent times, is because we humans live at such high population densities on this planet—7.7 billion of us now. We are abundant beyond precedent, we are crowded together, we are vulnerable—and the poorest of us are the most vulnerable. We are highly available to mosquitoes and the killer bugs they carry. Chimpanzees and gorillas suffer some of the same diseases but aren’t nearly so copiously available. We have multiplied and made space for ourselves in mosquito habitats, invading them and transforming them like…well, like the rampaging army of Winegard’s preferred metaphor, war. His book is indeed quite a war story, with one heroic combatant and one villainous enemy, but Earth’s history writ from the mosquito side would look much different.
