

Book Reviews

Dana G. Dalrymple, *Artemisia annua, Artemisinin, ACTs & Malaria Control in Africa: Tradition, Science and Public Policy* (Washington DC: Politics and Prose Bookstore, 2012), pp. 253, \$18.00, paperback, ISBN: 978-0-615-61599-8.

Dana Dalrymple describes himself as ‘an agricultural economist by vocation and a historian by avocation’ so it should come as no surprise that it was while on secondment from the US Department of Agriculture in 2004 that the seed of his obsession with the herbal antimalarial *Artemisia annua* was planted. Dalrymple’s assignment was to write a ‘modest briefing paper’ that could inform the US Agency for International Development’s technical support to farmers in East Africa who were cultivating *A. annua* for use in artemisinin-derived combination therapies (ACTs). But his retirement in 2008 did nothing to curb his growing obsession and he spent the next four years gathering further material. The result, replete with 1450 references, is what amounts to a very useful overview of the scientific and public policy literature on artemisinin, one that should serve as a primer to both historians of medicine and historians of public health. In the course of tracing artemisinin’s odyssey from a forgotten Chinese cure for haemorrhoids to the World Health Organization’s current front-line treatment for malaria in Africa and Asia, Dalrymple also makes some highly salient observations about the tension between Western pharmaceutical science and traditional medical belief systems, one that may yet determine whether artemisinin lives up to its hype as the world’s current ‘best hope’ of controlling the deadly parasitological disease.

Artemisinin’s back-story is by now well-known: how at the height of the Cultural Revolution Mao-Tse-Tung instructed Chinese scientists to search traditional medical recipe books in search of an antimalarial with which to treat Vietcong and Khmer Rouge soldiers fighting in the mosquito-infested jungles of northern Vietnam and Cambodia; how after screening 2000 preparations, Youyou Tu, a chemist at the China Academy of Traditional Medicine in Beijing, identified a herb, Qinghao, first mentioned in a recipe book dating from 168 BC, and went on to extract a colourless crystalline substance, Qinghaosu; and how in the early 1980s, Tu and other Chinese scientists would begin sharing their research on artemisinin with the WHO/TDR Chemotherapy of Malaria (CHEMAL) scientific working group.

Less well-known is the hiatus that followed these exciting pharmaceutical discoveries. Although Western scientists began experimenting with artemisinin derivatives, such as artesunate and arteether, as early as 1984, it would be 10 years before the Swiss company Novartis would acquire the patent to the Chinese combination therapy, artemisinin and lumefantrine (later marketed under the brand name Coartem), and 15 years before the WHO would recognise the value of ACTs as a front-line treatment against chloroquine-resistant strains of the parasite.

Dalrymple has little to say about this hiatus or about the further delays that followed the WHO’s grudging adoption of ACTs in 2002 while continuing to support the failing but comparably low-cost chloroquine and sulphamethoxazole drug combinations. Instead, he simply

observes that between 2002 and 2004 there was 'very little apparent progress in the use of ACTs' (p. 24). Nick White and Amir Attaran's incendiary 2004 paper in *The Lancet* when they accused the WHO and the Global Fund of 'medical practice' for blocking the introduction of ACTs in Africa in favour of old-line antimalarials is given similarly short shrift, although Dalrymple grudgingly acknowledges that 'while doubtless annoying to some, they are credited with others with getting things moving' (p. 24). Nor is he much interested in probing the role of his former employer, USAID, or its health advisor, Dr Dennis Carroll, who in 2002 blithely informed the *New York Times* that artemisinin was 'not ready for prime time'.

Instead, the bulk of his book is devoted to the hoary horticultural and logistical issues involved in cultivating *A. annua* and moving from plant to the extraction of a useful pharmaceutical product. Along the way, Dalrymple provides a clear explication of the various regulatory hurdles standing between manufacturers and a place on the WHO's coveted 'approved' medicines list, as well as the vagaries of the market mechanisms involved in the distribution of ACTs and the maintenance of a steady supply of the plant material. Students of public health wishing to pick their way through this dense undergrowth could not wish for a better guide. If for nothing else, I am grateful to Dalrymple for taking the trouble to set out the lag between the Global Fund's promise in 2006 to release \$230 million for the purchase of ACTs and the actual disbursements, which did not flow through until two years later (pp. 99–100). When time comes for historians to examine the record of malaria control in the early noughties, they will also find useful Dalrymple's detailed discussions of drug 'stockouts', counterfeiting and the role of the public and private sector in complex ACT distribution chains. Unfortunately, while many biologists spend their whole careers on malaria, the interest shown by social scientists in the subject 'has generally been much more limited and spasmodic' (p. 160). Dalrymple also observes how for all of the effort that goes into the design of sophisticated pharmaceutical ACT blister packs, two in three people in Africa and Asia continue rely on traditional medicines for their primary healthcare. But while this might suggest it would be worth paying rather more attention that at present to the utility of herbal remedies, Dalrymple comments that 'the use of artemisinin in teas... is a case where tradition and science rub up against each other, and not altogether comfortably' (p. 10).

He ends his book by observing that malaria, perhaps more than any other tropical disease, involves the interplay of complex technical, economic and social factors. In this respect, the challenge of artemisinin is similar to the challenge faced by quinine, the original plant-derived cure for malaria, before it and the challenge that will no doubt face the therapies that come after: namely, how to keep one step ahead of the ever-evolving malaria parasite. On this score, Dalrymple ends by quoting the Red Queen's famous advice to Alice about the need to keep running just to stand still, but perhaps the malariologist Socrates Litsios, who he cites in an epigraph to the book, put it best when he said, 'It would be foolhardy of anyone to predict when and how malaria will be conquered'.

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