

OBITUARY

Richard H. Ward, Ph.D. (June 7, 1943–February 14, 2003): Wild Ride of the Valkyries

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In Memoriam: Richard H. Ward, Ph.D. (June 7, 1943–February 14, 2003)
First contact. Amazonia, 1971. Courtesy M. E. Ramirez.

The older one gets, the more one must get used to what Byron called “the worst of woes that wait on age,” the passing of people with whom one has shared a professional lifetime (Byron 1812). When this is preceded by a long illness, or when the person had seemed frail or vulnerable, the event is sad. But when a model of energy and vigor who had not yet reached 60 goes suddenly, the blow is hard.

Incredibly, Ryk Ward has died.

Ryk was born in Sawbridgeworth, England, but grew up in New Zealand. His anthropological interests were early; he became an honorary Maori, among other things. After his 1966 degree in Anthropology, Botany, and Genetics from the University of Auckland, Ryk came to Ann Arbor to study human genetics with Jim Neel. His Ph.D. was in human genetics in 1970, and he remained for

several years of postdoctoral work. He then held faculty positions in epidemiology and anthropology at the University of Washington, in medical genetics at the University of British Columbia, and then in human genetics at the University of Utah School of Medicine.

In 1996, he assumed the distinguished position of Professor of Biological Anthropology at the University of Oxford. A Kiwi in the Land of Dons, with his Texas boots and austral twang, he must have been a unique presence. Despite budgetary and other political challenges, he and a handful of stalwarts were restoring the stature of biological anthropology at Oxford as a leading program in the world. Although not too proud to change the toilet rolls or light bulbs himself in his shamefully underfunded department, he was at the same time peer of the most prominent of scientists and of students alike. At his death, there were rumors that the politics and funding were turning favorable. He might have found that boring!

Ryk arrived at Michigan at the height of Neel’s studies



Ryk and Maria, windblown. Cyclades Islands, 2001. Courtesy M. E. Ramirez.

of human variation and population structure in the Amazon, specifically of the Yanomami, probably the best study of its kind ever done. The genetics of the time were crude, but no other study has unified such a depth and diversity of demographic, cultural, and biomedical data. The idea was to observe the day-to-day pattern of natural tribal human populations that quantitatively resembled, in important ways, those of our earliest ancestors. By understanding how this works today, one might use genetic data to infer the past social and demographic patterns, behavior of a type ultimately responsible for the distribution of human genetic variation (Neel and Ward 1970; Ward 1972; Ward et al. 1975; Ward and Neel 1976; Ward and Weiss 1976; Smouse and Ward 1978). Among other findings, this work showed how the effects of culturally driven patterns of village fission, fusion, and admixture are reflected in clinal patterns of gene frequency regionally, and even among geographically local villages.

Ryk was an adventurous type who would have been at home trekking the South American waterways with von Humboldt, Wallace, or Bates. He was one of the young leaders of a grand era of holistic anthropological genetics (quite different from today's bleed-and-sequence armchair version). His storied trips included a race against

time to try to head off a measles epidemic with vaccine and other assistance and a venture into the hinterlands with Napoleon Chagnon (Chagnon 1974, pp. 172–175) to contact a village they had heard about (and what they heard was that the village might be dangerously hostile) (fig. 1).

Ryk was the complete package, a scientist in every best sense of the term. Much of his research combined fieldwork, epidemiology, laboratory and population genetics, and evolutionary inference. He worked with diverse groups, from the Nuu-Chah-Nulth in the Pacific Northwest to Central and South America, Africa, the Caribbean, and the Pacific Islands. As modern genotyping technology became available, he and collaborators made influential contributions of population genetic models and molecular analysis to our understanding of human history. Among other things, they demonstrated evidence of a history of rapid expansion in circumarctic populations, sufficient intratribal Native American lineage diversity to show that major bottlenecks did not have to be invoked to explain Native American settlement history, and that widely held language-based three-wave settlement scenarios did not correspond with today's linguistic diversity as neatly as had been expected (Ward

et al. 1991; Lundstrom et al. 1992*a*, 1992*b*; Shields et al. 1993; Ward et al. 1993; Ward and Valencia 1996). Ryk even worked on bears (Waits et al. 1999).

Anthropological genetic studies, even when biomedically motivated, have appropriately become controversial. The issue is the imbalance between outside scientists' power and professional interests that may be only of perfunctory relevance to the vital vulnerabilities and interests of indigenous peoples, so many of whose cultural and material living conditions have been devastated by impositions of the outside world. These controversies involved Ryk as they have others. Questions arose years (and, in the case of the Yanomami, decades) later as to what kind of informed consent had been obtained and what was promised in exchange for blood samples. Indigenous peoples are understandably suspicious that we feed our careers from their veins.

Ryk recognized the problem fully: the last thing he and I discussed, late in 2002, was how to return samples in our custody, that he had so arduously collected, to the Yanomami to try to harmonize feelings on that score.

It is unfortunate that issues like these—and our government's unwillingness proactively to confront the associated problems of racism—led to the effective killing of the Human Genome Diversity Project, of which Ryk was an organizer. The National Institutes of Health have recently been forced to recognize the importance of variation in biomedical studies after all but still struggle to account in more than a perfunctory way for the complexity of global variation that Ryk and others had pointed out; this has potential consequences for the equitable distribution of any benefits that might be gained from biomedical genetics.

Much of Ryk's attention concerned the role of genetic variation in chronic disease susceptibility, always with a comparative population or evolutionary perspective (Adams and Ward 1973; Ward 1980, 1990). In the 1980s, he applied the limited genetic technology of the time to search for HLA-related associations with rheumatoid arthritis and other disorders and for the apparent particular susceptibility of Native Americans (Atkins et al. 1988; Hasstedt et al. 1994). It is unfortunate that that stubborn problem remains unsolved; HLA associations are strong but account for only a fraction of cases and by unclear mechanisms, nor is the special Native American susceptibility yet understood.

Cardiovascular disease and hypertension were Ryk Ward's most long-standing biomedical interest, and it is not surprising that his primary concern was the interaction between genetic variation and environment or lifestyle factors, which he properly took far more seriously than most investigators do. His early blood-pressure work was in the Tokelau Islands in the Pacific, where he and collaborators used migration as proxy for major

environmental change (e.g., Ward et al. 1980; Ramirez et al. 1991). That enabled them to document the strong effects of environment, including shared familial effects. Ryk was involved in many other studies of blood pressure—in Nigeria, Cameroon, Jamaica, and elsewhere—in particular, to evaluate the effects of allelic variation in candidate genes interacting with changing lifestyle exposures (Motulsky et al. 1987; Rotimi et al. 1996, 1997). For example, they took advantage of the more complex genetic variation typically found in Africans to identify or confirm the effects of candidate gene regions, which were under active investigation at the time of his death, and to refine the effects on blood-pressure variation of alleles in the angiotensin I converting enzyme (ACE) gene.

There is a pandemic of hypertension in African-derived peoples of the Americas, and an important but subtle question is what, if any, genetic basis underlies the problem (Cooper et al. 1999). Cooper and colleagues' work has shown that, despite evidence for major gene effects on angiotensinogen (AGT) levels in Nigeria (Guo et al. 1999), there is a much greater environmental component in both ACE and AGT enzyme levels in African-derived peoples now in the Americas (Cooper et al. 2000). This kind of pattern is on the minds of many today who wrestle with the appropriate way to include population and, in particular, "race" differences in biomedical genetics (Cooper et al. 2003). This is a challenging problem in general, because one does not wish to overstate population differences or to geneticize them, but Ryk had shown back in his Amazonian work that the crude markers available sufficed to demonstrate microdifferentiation even at the village level. At the time of his death, Ryk was continuing to work on the related question of estimating the relative informativeness of rare, geographically localized variants, compared with common, globally distributed variation, for reconstructing ancestry and for genetic epidemiological purposes.

The shock felt at the news of Ryk's passing will reverberate for a long time. As a friend, he was the best, as the many who knew him will attest. He was a person of fine humor (though he couldn't tell a joke and get it right). His tree of colleagues and students is globally scattered and ramified, characterized by a broad outlook on science and a sophisticated grasp of the issues. Ryk leaves behind him his wonderful and remarkable wife, Maria Eugenia Ramirez, a biomedical scientist in her own right, and four intercontinentally named children, Kimiora, Rewi, Reniera, and Ricardo. Maria is Mexican, and this international clan accurately reflects his position as a citizen of the world.

Any reflections on Ryk Ward must give place of honor to the importance he gave to his students. Inexplicably, even when on a medical school faculty, he regularly volunteered to go down the hill to actually teach courses

(not “classes” and, if you can believe it, even to undergraduates). Of course, this was never truer than at Oxford, where the burden is not light. It was no surprise to learn that his last official act, immediately before his death, was a meeting with his students.

Ryk published but didn't really play the paper-chase game. For those who think the balance sheet of life is the “Publications” section of a curriculum vitae, Ryk (not a tall person) was unusual in that his head might still be visible above a stack of his reprints. That would be fine with him, because it would mean he could still see the world around him. He was a person of rare talents, perceptive and integrative insight, and substantial influence who never had to rest on citations. Graduate students, *take heed!* There is more to science than sequence, more to life than science, and mountains to climb other than a pile of your grant applications.

Ryk always ran in the frantic lane. We who complain of our daily burdens were awed by the juggling act that constituted his life. Ryk's typical final semester was, to use a musical analogy, a multicontinental *tremolo* of a hemi-demi-semi-quavered sabbatical. Indeed, Ryk's life was one wild Wagnerian Ride of the Valkyries. It was an endless scrum, with Ryk (no helmet, of course, but without care for his own safety) charging, legs tirelessly a-wheeling, sometimes disappearing into the pile of giants on the rugby pitch of life. Ryk was relentlessly competitive and liked to win, but not in the exclusionary or acquisitive sense so pervasive today. Much to the contrary, his indefatigability was generously at the service of others.

From his scrawl (he was a physician's son, after all) to much else, Ryk's level of (dis)organization and his lack of smooth (or phony) politics kept him ever close to the maelstrom. If you wanted a sincere, honest, and clear-headed idea of how things should be and an intellectually sophisticated view of genetics and what it might do, you could not ask a better person. But I think he was never nominated for a Manager of the Year award. Always on the go, usually in confusion, he made the just-in-time approach to productivity an undeclared matter of principle. In a sense his friends will recognize, he had established a perfect record: he was never known to make an obligation on time.

So, Ryk, after all these years, why'd you have to catch this early flight?*

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* A rhetorical question. He wanted to get there first.

References

- Adams J, Ward RH (1973) Admixture studies and the detection of selection. *Science* 180:1137–1143
- Atkins C, Reuffel L, Roddy J, Platts M, Robinson H, Ward RH (1988) Rheumatic disease in the Nuu-Chah-Nulth native Indians of the Pacific Northwest. *J Rheumatol* 15:684–690
- Byron GL (1812) *Childe Harold's pilgrimage*. Public domain
- Chagnon N (1974) *Studying the Yanomamo*. Holt, Rinehart, Winston, New York
- Cooper RS, Guo X, Rotimi CN, Luke A, Ward R, Adeyemo A, Danilov SM (2000) Heritability of angiotensin-converting enzyme and angiotensinogen: a comparison of US blacks and Nigerians. *Hypertension* 35:1141–1147
- Cooper RS, Kaufman JS, Ward R (2003) Race and genomics. *N Engl J Med* 348:1166–1170
- Cooper RS, Rotimi CN, Ward R (1999) The puzzle of hypertension in African-Americans. *Sci Am* 280:56–63
- Guo X, Rotimi C, Cooper R, Luke A, Elston RC, Ogunbiyi O, Ward R (1999) Evidence of a major gene effect for angiotensinogen among Nigerians. *Ann Hum Genet* 63:293–300
- Hasstedt SJ, Clegg DO, Ingles L, Ward RH (1994) HLA-linked rheumatoid arthritis. *Am J Hum Genet* 55:738–746
- Lundstrom R, Tavaré S, Ward RH (1992a) Estimating substitution rates from molecular data using the coalescent. *Proc Natl Acad Sci USA* 89:5961–5965
- (1992b) Modeling the evolution of the human mitochondrial genome. *Math Biosci* 112:319–335
- Motulsky AG, Burke W, Billings PR, Ward RH (1987) Hypertension and the genetics of red cell membrane abnormalities. *Ciba Found Symp* 130:150–166
- Neel JV, Ward RH (1970) Village and tribal genetic distances among American Indians, and the possible implications for human evolution. *Proc Natl Acad Sci USA* 65:323–330
- Ramirez M, Brauer G, Prior M, Ward RH (1991) Biological variability in a migrating isolate, the Tokelau Islands: child growth in different environments. *Am J Hum Biol* 3:189–201
- Rotimi C, Cooper R, Ogunbiyi O, Morrison L, Ladipo M, Tewksbury D, Ward R (1997) Hypertension, serum angiotensinogen, and molecular variants of the angiotensinogen gene among Nigerians. *Circulation* 95:2348–2350
- Rotimi C, Puras A, Cooper R, McFarlane-Anderson N, Forrester T, Ogunbiyi O, Morrison L, Ward R (1996) Polymorphisms of renin-angiotensin genes among Nigerians, Jamaicans, and African Americans. *Hypertension* 27:558–563
- Shields GF, Schmiechen AM, Frazier BL, Redd A, Vovoda MI, Reed JK, Ward RH (1993) mtDNA sequences suggest a recent evolutionary divergence for Beringian and northern North American populations. *Am J Hum Genet* 53:549–562
- Smouse PE, Ward RH (1978) A comparison of the genetic infrastructure of the Ye'cuana and the Yanomama: a likelihood analysis of genotypic variation among populations. *Genetics* 88:611–631
- Waits LP, Sullivan J, O'Brien SJ, Ward RH (1999) Rapid radiation events in the family Ursidae indicated by likelihood phylogenetic estimation from multiple fragments of mtDNA. *Mol Phylogenet Evol* 13:82–92

- Ward RH (1972) The genetic structure of a tribal population, the Yanomama Indians. V. Comparisons of a series of genetic networks. *Ann Hum Genet* 36:21–43
- (1980) Genetic epidemiology: promise or compromise? *Soc Biol* 27:87–100
- (1990) Familial aggregation and genetic epidemiology of blood pressure. In: Laragh J, Brenner B (eds) *Hypertension, Pathophysiology, Diagnosis, and Management*. Raven Press, New York, pp 81–100
- Ward RH, Chin PG, Prior IA (1980) Tokelau Island migrant study: effect of migration on the familial aggregation of blood pressure. *Hypertension* 2:I43–I54
- Ward RH, Frazier BL, Dew-Jager K, Paabo S (1991) Extensive mitochondrial diversity within a single Amerindian tribe. *Proc Natl Acad Sci USA* 88:8720–8724
- Ward RH, Gershowitz H, Layrisse M, Neel JV (1975) The genetic structure of a tribal population, the Yanomama Indians XI. Gene frequencies for 10 blood groups and the ABH-Le secretor traits in the Yanomama and their neighbors; the uniqueness of the tribe. *Am J Hum Genet* 27:1–30
- Ward RH, Neel JV (1976) The genetic structure of a tribal population, the Yanomama Indians. XIV. Clines and their interpretation. *Genetics* 82:103–121
- Ward RH, Redd A, Valencia D, Frazier B, Paabo S (1993) Genetic and linguistic differentiation in the Americas. *Proc Natl Acad Sci USA* 90:10663–10667
- Ward RH, Valencia D (1996) Phylogeographic variability in traditional societies. *Ciba Found Symp* 197:6–19; discussion 19–24
- Ward RH, Weiss KM (eds) (1976) *The demographic evolution of human populations*. Academic Press, New York