

# THE SKELETON LAKE

*What happens when genetics upends history?*

BY DOUGLAS PRESTON

In the winter of 1942, on the shores of a lake high in the Himalayas, a forest ranger came across hundreds of bones and skulls, some with flesh still on them. When the snow and ice melted that summer, many more were visible through the clear water, lying on the bottom. The lake, a glacial tarn called Roopkund, was more than sixteen thousand feet above sea level, an arduous five-day trek from human habitation, in a mountain cirque surrounded by snowfields and battered by storms. In the midst of the Second World War, British officials in India initially worried that the dead might be the remains of Japanese soldiers attempting a secret invasion. The apparent age of the bones quickly dispelled that idea. But what had happened to all these people? Why were they in the mountains, and when and how had they died?

In 1956, the Anthropological Survey of India, in Calcutta, sponsored several expeditions to Roopkund to investigate. A snowstorm forced the first expedition to turn back, but two months later another expedition made it and returned to Calcutta with remains for study. Carbon dating, still an unreliable innovation, indicated that the bones were between five hundred and eight hundred years old.

Indian scientists were intensely interested in the Roopkund mystery. The lake, some thought, was a place where holy men committed ritual suicide. Or maybe the dead were a detachment of soldiers from a thirteenth-century army sent by the Sultan of Delhi in an ill-fated attempt to invade Tibet, or a group of Tibet-bound traders who had lost their way. Perhaps this was hallowed ground, an open-air cemetery, or a place where victims of an epidemic were dumped to prevent contagion.

People in the villages below Roopkund had their own explanation, passed down in folk songs and stories. The vil-

lages are on the route of a pilgrimage to honor Nanda Devi, a manifestation of Parvati, a supreme goddess in Hinduism. The pilgrimage winds up through the foothills of the Trisul massif, where locals believe that the goddess lives with her husband, Shiva. It may be the longest and most dangerous pilgrimage in India, and a particularly perilous section—the Jyumra Gali, or Path of Death—runs along a ridge high above Roopkund. As the villagers tell it, long ago Nanda Devi left her home to visit a distant kingdom, where she was treated discourteously by the king and queen. Nanda Devi cursed the kingdom, unleashing drought and disaster, and infesting the milk and rice with maggots. In order to appease the goddess, the royal couple embarked on a pilgrimage. The king, who liked his entertainments, took along a bevy of dancing courtesans and musicians, in violation of the ascetic traditions of the pilgrimage. Nanda Devi was furious at the display of earthly pleasures, and she shoved the dancing girls down into the underworld. The pits into which they are said to have sunk are still visible high on a mountainside. Then, according to the legend, she sent down a blizzard of hail and a whirlwind, which swept all the pilgrims on the Path of Death into the lake. Their skeletons are a warning to those who would disrespect the goddess.

This story is retold in “Mountain Goddess,” a 1991 book by the American anthropologist William Sax. Now a professor at Heidelberg University, he stumbled upon a reference to the lake and the bodies as an undergraduate, in the nineteen-seventies, and was fascinated. He and a friend travelled to the hamlet of Wan, the settlement closest to Roopkund, where a local man agreed to guide them up the pilgrim trail to the lake. The trail climbs through deep forests, emerging above the tree line, at eleven and a half thousand feet, into meadows



*Analysis of the human remains found at*



*Roopkund, in the Himalayas, has raised baffling questions about who these people were and why they were there.*

carpeted with wildflowers. To the north is a vast wall of Himalayan peaks, some of the highest in the world. From there, the route follows steep ridgelines and leads past an ancient stone shrine, festooned with bronze bells and tridents and containing a statue of the elephant deity Ganesha. Then, at fifteen thousand feet, it goes over a pass and up a series of switchbacks through scree to Roopkund. The lake, about a hundred and thirty feet across and ten feet deep, is an emerald jewel nestled in a bowl of rock and ice. (In Hindi, *roop kund* means “beautifully shaped lake.”) Almost as soon as Sax and his companions arrived, they were engulfed by a blizzard and stumbled around the bone-strewn cirque in white-

out conditions, calling for one another and nearly adding their own bodies to the charnel ground.

Exhausted and feverish, Sax barely made it back to Wan with his companions, and spent ten days recovering in his guide’s stone hut. Yet his passion for the place was undimmed. He went on to write a doctoral thesis about the local traditions surrounding Nanda Devi. In the late eighties, he went on the pilgrimage himself, the only Westerner to have done so at that time, after which he published “Mountain Goddess.” The book describes how the Himalayas, “associated for thousands of years in India’s literatures with famous pilgrimage places and powerful, ascetic renouncers,” became the setting for followers to show devotion to the goddess by “giving suffering” to their bodies.

In 2005, Sax was featured in a National Geographic documentary about the lake. The Indian media company that made the film assembled a team of archeologists, anthropologists, geneticists, and technicians from research laboratories in India and the U.K. to collect and study the bones. In the decades since Sax first visited, the lake had become a popular destination in the trekking community and the site was being ruined. Bones had been stolen; others had been rearranged in fanciful patterns or piled in cairns. Almost none of the skeletons were intact, and it was impossible to tell which bones

belonged together or where they had originally lain. Nature had added to the confusion, churning and fracturing the bones with rock slides and avalanches. But a recent landslide had exposed a cache of fresh bones and artifacts. Under a slab of rock, the team found the remains of a woman, bent double. The body was intact and still had skin and flesh. The scientists removed tissue sam-

ples for testing, shot video, and collected bones and artifacts. The team estimated that the area contained the remains of between three hundred and seven hundred people.

The scientific analysis swiftly discounted most of the prevailing theories. These were not the remains of a lost army: the bones

were from men, women, and children. Aside from a single iron spearhead, no weapons were found, and there was no trace of horses. The bones showed no evidence of battle, ritual suicide, murder, or epidemic disease. Nor was Roopkund a cemetery: most of the individuals were healthy and between eighteen and thirty-five years old. Meanwhile, the team’s geographic analysis laid to rest the idea of traders lost in the mountains, establishing that no trade route between India and Tibet had ever existed in the area. Although the Tibetan border is only thirty-five miles north of Roopkund, the mountains form an impassable barrier. Besides, no trade goods or beasts of burden were found with the bodies. Artifacts retrieved included dozens of leather slippers, pieces of parasols made of bamboo and birch bark, and bangles made of seashells and glass. Devotees of Nanda Devi carry parasols and wear bangles on the pilgrimage. The dead, it appeared, were most likely pilgrims.

DNA analysis showed that all the victims appeared to have a genetic makeup typical of South Asian origin. Bone and tissue samples were sent to Oxford University for carbon dating. The new dates, far more accurate than the 1956 ones, formed a tight cluster in the ninth century. Tom Higham, who performed the analysis, concluded that the victims had perished in a single event and had “died instantaneously within

hours of one another.” Meanwhile, a team of bioarcheologists and paleopathologists noted the presence of two distinct groups: there were “rugged, tall” people with long heads and also some “medium height, lightly built, round headed” people, who displayed a curious shallow groove across the vault of the skull. The scientists concluded that the dead represented two populations: a group of tall Brahmans from the plains of India and a company of shorter, local porters, whose skulls were marked by years of carrying heavy loads with a tumpline looped over their heads.

The investigation also revealed that three or possibly four skulls had compression fractures on the crown that had probably occurred at the time of death. “It is not a weapon injury,” the researchers noted, but came “from a blow from a blunt and round heavy object.” This stretch of the Himalayas is notorious for hailstorms, which destroy crops and damage property. The team concluded that, around the year 800 A.D., a group of pilgrims were caught in a storm on the exposed ridge above Roopkund and were pummeled to death by giant hailstones. Over the years, landslides and avalanches had rolled the bodies down the steep slope into the lake and the surrounding area. Not only did the mystery of Roopkund appear to be solved; it also seemed that the local tales of Nanda Devi’s wrath had originated in an actual event.

Last year, however, *Nature Communications* published the baffling results of a new study conducted by sixteen research institutions across three continents. Genetic analysis and new carbon dating revealed that a significant proportion of the Roopkund remains belonged to people from somewhere in the eastern Mediterranean, most likely near Crete, and that they had perished at the lake only a couple of centuries ago.

India is an ideal country for studying human genetics, ancient and modern. There are fewer cultural barriers to handling human biological materials than in many parts of the world, and Indian scientists have eagerly pursued research into the peopling of the subcontinent. Geneticists have sampled the DNA of hundreds of living populations,



making India one of the most genetically mapped countries in the world. In 2008, David Reich, a geneticist at Harvard, made the first of many trips to the country, and visited a leading life-science research institution, the Centre for Cellular and Molecular Biology, in Hyderabad. While there, he discussed someday collaborating on a more detailed study of the Roopkund bones with the center's director, Lalji Singh, and Kumarasamy Thangaraj, a geneticist who had headed up the previous DNA analysis. By the time work began, in 2015, the team, led by the Reich lab and the laboratory in Hyderabad, also included researchers at Pennsylvania State University, the Broad Institute of M.I.T. and Harvard, the Max Planck Institute for the Science of Human History, and the Anthropological Survey of India, where many of the Roopkund bones reside.

Not long before the COVID-19 pandemic shut down the U.S., I visited Reich at Harvard Medical School. His office is a minimalist space with a whiteboard, a table, and a wall of glass looking across Avenue Louis Pasteur to the red brick façade of the Boston Latin School. Reich is a lean, fit man in his mid-forties who speaks with rapid, quiet precision. His self-deprecating manner conceals a supremely self-confident iconoclast who is not averse to toppling received wisdom, and his work has attracted criticism from some anthropologists, archeologists, and social scientists. The Reich lab, the foremost unit in the country for research into ancient DNA, is responsible for more than half the world's published data in the field. Having so far sequenced the DNA of more than ten thousand long-dead individuals from all over the globe, the lab is almost halfway through a five-year project to create an atlas of human migration and diversity, allowing us to peer deep into our past. The work has produced startling insights into who we are as a species, where we have come from, and what we have done to one another. Hidden in the human genome is evidence of inequality, the displacement of peoples, invasion, mass rape, and large-scale killing. Under the scrutiny of science, the dead are becoming eloquent.

Last year, Reich led a team of more than a hundred researchers who pub-

lished a study in *Science* that examined the genomes of some two hundred and seventy ancient skeletons from the Iberian Peninsula. It's long been known that, from around 2500 to 2000 B.C., major new artistic and cultural styles flourished in Western and Central Europe. Archeologists have tended to explain this development as the result of cultural diffusion: people adopted innovations in pottery, metalworking, and weaponry from their geographic neighbors, along with new burial customs and religious beliefs. But the DNA of Iberian skeletons dating from this period of transformation told a different story, revealing what Reich describes as the "genetic scar" of a foreign invasion.

In Iberia during this time, the local type of Y chromosome was replaced by an entirely different type. Given that the Y chromosome, found only in males, is passed down from father to son, this means that the local male line in Iberia was essentially extinguished. It is likely that the newcomers perpetrated a large-scale killing of local men, boys, and possibly male infants. Any local males remaining must have been subjugated in a way that prevented them

from fathering children, or were so strongly disfavored in mate selection over time that their genetic contribution was nullified. The full genetic sequencing, however, indicated that about sixty per cent of the lineage of the local population was passed on, which shows that women were not killed but almost certainly subjected to widespread sexual coercion, and perhaps even mass rape.

We can get a sense of this reign of terror by thinking about what took place when the descendants of those ancient Iberians sailed to the New World, events for which we have ample historical records. The Spanish conquest of the Americas produced human suffering on a grotesque scale—war, mass murder, rape, slavery, genocide, starvation, and pandemic disease. Genetically, as Reich noted, the outcome was very similar: in Central and South America, large amounts of European DNA mixed into the local population, almost all of it coming from European males. The same Y-chromosome turnover is also found in Americans of African descent. On average, a Black person in America has an ancestry that is around eighty per



"O.K., now, who ordered the glass half empty, and who ordered the glass half full?"

cent African and twenty per cent European. But about eighty per cent of that European ancestry is inherited from white males—genetic testimony to the widespread rape and sexual coercion of female slaves by slaveowners.

In the Iberian study, the predominant Y chromosome seems to have originated with a group called the Yamnaya, who arose about five thousand years ago, in the steppes north of the Black Sea and the Caspian Sea. By adopting the wheel and the horse, they became powerful and fearsome nomads, expanding westward into Europe as well as east and southward into India. They spoke proto-Indo-European languages, from which most of the languages of Europe and many South Asian languages now spring. Archeologists have long known about the spread of the Yamnaya, but almost nothing in the archeological record showed the brutality of their takeover. “This is an example of the power of ancient DNA to reveal *cultural events*,” Reich told me.

It also shows how DNA evidence can upset established archeological theories and bring rejected ones back into contention. The idea that Indo-European languages emanated from the Yamnaya homeland was established in 1956, by the Lithuanian-American archeologist Marija Gimbutas. Her view, known as the Kurgan hypothesis—named for the distinctive burial mounds that spread west across Europe—is now the most widely accepted theory about Indo-European linguistic origins. But, where many archeologists envisaged a gradual process of cultural diffusion, Gimbutas saw “continuous waves of expansion or raids.” As her career progressed, her ideas became more controversial. In Europe previously, Gimbutas hypothesized, men and women held relatively equal places in a peaceful, female-centered, goddess-worshipping society—as evidenced by the famous fertility figurines of the time. She believed that the nomads from the Caspian steppes imposed a male-dominated warrior culture of violence, sexual inequality, and social stratification, in which women were subservient to men and a small number of elite males accumulated most of the wealth and power.

The DNA from the Iberian skeletons can't tell us what kind of culture

the Yamnaya replaced, but it does much to corroborate Gimbutas's sense that the descendants of the Yamnaya caused much greater disruption than other archeologists believed. Even today, the Y chromosomes of almost all men of Western European ancestry have a high percentage of Yamnaya-derived genes, suggesting that violent conquest may have been widespread.

The team members of the Roopkund study planned a variety of tests for the bones. DNA sequencing would show the ancestry of the victims and whether they were related to one another, and carbon dating would estimate when they died. The researchers would test for disease, and analyze the chemistry of the bones to determine the victims' diet and where they might have grown up. Under sterile conditions, the scientists in Hyderabad drilled into long bones and teeth, producing a powder. Vials of this were sent to Harvard and to other labs in India, the United States, and Germany.

An ancient human bone is packed with DNA, but, in many cases, ninety-nine per cent or more of that is not human. It is the DNA of billions of microbes that colonized the body during the decomposition after death. To tease the tiny fraction of human DNA from this mass of microbial debris requires a chemical ballet of enormous delicacy, and the risk of contamination is high. Stray DNA



molecules from people who handled the remains can ruin an entire sample.

David Reich's lab has a “clean room” for extracting and processing DNA from human tissue. Personnel pass through a dressing area, where they don a full-body clean suit with booties and hood, double pairs of nitrile gloves (the inner one sealed to the suit with tape around the wrists), a hairnet, a face mask, and a plastic shield. The clean room is maintained at positive pressure, which keeps

the airflow directed outward, to curtail the entry of airborne DNA. After anything is touched in the room, the outer pair of gloves must be stripped off and a fresh pair put on, in order to prevent the transfer of DNA from surface to surface. Intense ultraviolet light shines whenever the room is empty, to destroy stray DNA. The light is shut off when the lab is occupied, because it burns human skin and eyes.

When I visited, a technician was working on a nubbin of bone from an ancient Roman who lived in Belgium. The whine of a sandblaster filled the air as she removed excess bone from a tiny treasure chest of DNA—a spiral cavity in the inner ear called the cochlea. The bone in which the cochlea is embedded is the densest in the body, and provides the best source of preserved DNA in ancient remains. DNA this old breaks up into short strands. Getting enough to sequence requires complex processes, one of which involves placing samples in a machine that produces a polymerase chain reaction, copying the fragments up to a billion times. The lab doesn't sequence the entire DNA molecule, much of which is repetitious and uninformative, but maps about a million key locations.

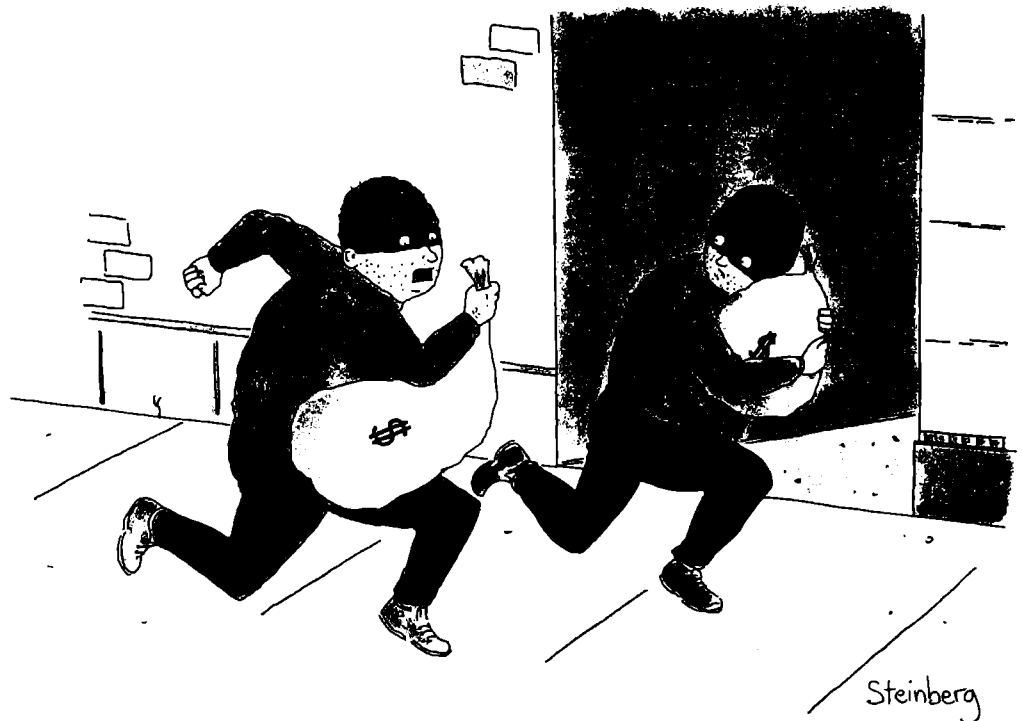
Reich had asked a graduate student in his lab, Éadaoin Harney, to take charge of the Roopkund project. Her role was to analyze the Roopkund DNA, wrangle the worldwide team, assemble the results, and write the resulting paper as its lead author. (She has since taken a job as a postdoctoral researcher at the genomics firm 23andMe.) By the middle of 2017, it was apparent that the Roopkund bones belonged to three distinct groups of people. Roopkund A had ancestry typical of South Asians. They were unrelated to one another and genetically diverse, apparently coming from various areas and groups in India. Roopkund C was a lone individual whose genome was typical of Southeast Asia. It was the Roopkund B group, a mixture of men and women unrelated to one another, that confounded everyone. Their genomes did not look Indian or even Asian. “Of all places in the world, India is one of the places most heavily sampled in terms of human diversity,” Reich told me. “We have sampled three hundred different groups in

India, and there's nothing there even close to Roopkund B."

Harney and Reich began exploring the ancestry of the Roopkund B group, comparing the genomes with hundreds of present-day populations across Europe, Asia, and Africa. The closest match was with people from the Greek island of Crete. "It would be a mistake to say these people were *specifically* from Crete," Reich said. "A very careful analysis showed they don't match perfectly. They are clearly a population of the Aegean area." The Roopkund B group made up more than a third of the samples tested—fourteen individuals out of thirty-eight. Since the bones at the lake were not collected systematically, the finding hinted that the Mediterranean group in total might have been quite large. One-third of three hundred, the lower estimate of the Roopkund dead, is a hundred people.

As bizarre as the result seemed, it nonetheless matched an analysis of bone collagen that the Max Planck Institute and the Harvard lab had done on the same individuals, to determine their diet. Dietary information is stored in our bones, and plants, depending on how they fix carbon during photosynthesis, create one of two chemical signatures—C3 or C4. A person who eats a diet of C3 plants, such as wheat, barley, and rice, will have isotope ratios of carbon in their bones different from those of a person eating a diet high in millets, which are C4. Sure enough, the analysis of Roopkund bone collagen revealed that, in the last ten or so years of their lives, the Roopkund A people ate a varied C3 and C4 diet, typical for much of India; Roopkund B ate a mostly C3 diet, typical of the Mediterranean.

During the study, the Reich lab had divided up its bone-powder samples, sending one portion to the carbon-14-dating laboratory at Penn State. (Doing this rather than having the Penn State samples sent straight from Hyderabad was a way of insuring that the labs were working on the same individuals.) When the carbon-dating results came back, there was another surprise: there appeared to have been multiple mass-death events at Roopkund. The Roopkund A individuals probably died in three or possibly four incidents between 700 and 950 A.D. The Roopkund B group—from



*"It's not actually that much after taxes."*

the Mediterranean—likely perished in a single event a thousand years later. Because carbon-14 dating is difficult to interpret for the period between 1650 and 1950, the deaths could have occurred any time during that span, but with a slightly higher probability in the eighteenth century. The lone person of Southeast Asian ancestry in Roopkund C died around the same time.

The eighteenth-century date was so unexpected that Reich and Harney at first thought it might be a typo, or that the samples had been contaminated. Harney wrote up the findings, in a paper co-authored by twenty-seven other scientists. She told me, "We hoped that after the paper was published someone would come forward with information that would help us determine what might have happened at Roopkund—some historian or a person with knowledge of a group of European travellers who vanished in the Himalayas around that time."

When William Sax learned of the results, he was incredulous. He had spent years in the mountain villages below the lake, among the devotees of Nanda Devi. The women consider themselves to be keepers of the goddess's memory, and Sax had recorded and trans-

lated many of their songs and stories of the pilgrimage. He feels certain that if a large party of travellers, especially foreign travellers, had died at Roopkund in recent centuries, there would have been some record in folklore. After all, despite the new study's surprises, the Roopkund A group was not inconsistent with the earlier findings.

"I never heard a word, not a hint of a story, no folktale or anything," Sax told me. "And there's absolutely no reason to be up there if they *weren't* on the pilgrimage." The idea of a group of eighteenth-century Greeks on a Hindu pilgrimage seemed far-fetched. A simpler explanation would be that the Roopkund B bones somehow got mixed up while sitting in storage. "It is quite possible that these bones were contaminated," he said, and the researchers were simply taking their provenance on trust: "They didn't actually collect them themselves." Having been fascinated with the region's way of life for four decades, he also found the scientists' perspective lacking. "This isn't just a story about bones," he said. "It's also a story about human beings and religious devotion."

Many anthropologists and archeologists are uneasy about the incursion of genomics into their domain and suspicious of its brash certainties. "We're

not schooled in the nuances,” Reich admitted to me. “Anthropologists and geneticists are two groups speaking different languages and getting to know each other.” Research into human origins and the differences between populations is always vulnerable to misuse. The grim history of eugenics still casts a shadow over genetics—a field with limitless appeal for white supremacists and others looking to support racist views—even though, for half a century, geneticists have rejected the idea of large hereditary disparities among human populations for the great majority of traits. Genetic science was vital in discrediting racist biological theories and establishing that racial categories are ever-shifting social constructs that do not align with genetic variation. Still, some anthropologists, social scientists, and even geneticists are deeply uncomfortable with any research that explores the hereditary differences among populations. Reich is insistent that race is an artificial category rather than a biological one, but maintains that “substantial differences across populations” exist. He thinks that it’s not unreasonable to investigate those differences scientifically, although he doesn’t undertake such research himself. “Whether we like it or not, people *are* measuring average differences among groups,” he said. “We need to be able to talk about these differences clearly, whatever they may be. Denying the possibility of substantial differences is not for us to do, given the scientific reality we live in.”

In 2018, Reich published a book, “Who We Are and How We Got Here,” about how genetic science is revolutionizing our understanding of our species. After he presented material from the book as an Op-Ed in the *Times*, sixty-seven anthropologists, social sci-

entists, and others signed an open letter on BuzzFeed, titled “How Not to Talk About Race and Genetics.” The scholars complained that Reich’s “skillfulness with ancient and contemporary DNA should not be confused with a mastery of the cultural, political, and biological meanings of human groups,” and that Reich “critically misunderstands and misrepresents concerns” regarding the use of such loaded terms as “race” and “population.”

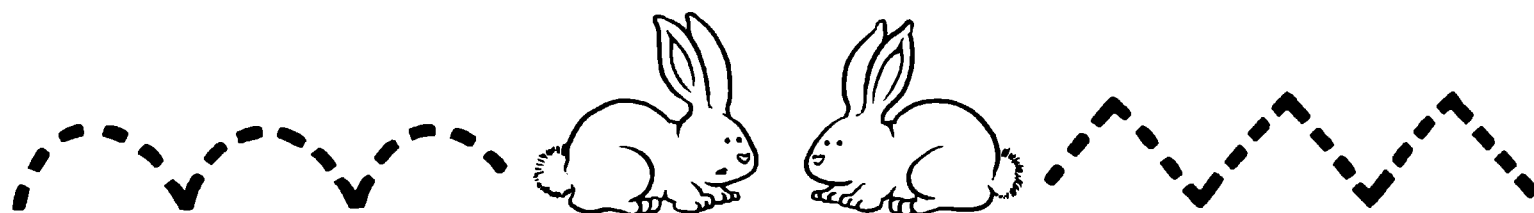
Reich’s lab now has an ethics-and-outreach officer, Jakob Sedig, whose job is to work with some of the cultural groups being studied, to understand and respond to their sensitivities. “We are mapping genetic groups to archeological cultures,” Sedig, who has a Ph.D. in anthropology from the University of Colorado, explained. “How we’re defining these groups genetically is not how they see themselves culturally. We don’t want to discredit other people’s beliefs, but we don’t want to censor our research based on those beliefs. There’s no one answer. You need a dialogue from the beginning.”

Reich acknowledges that geneticists need to be careful about how they discuss their work. He said that the majority of archeologists and anthropologists welcome the insights that genetic research provides, although “there are a small number of Luddites who want to break our machines.” In our conversations, Reich emphasized that the findings of geneticists were almost always unexpected and tended to explode stereotypes. “Again and again, I’ve found my own biases and expectations to be wrong,” he said. “It should make us realize that the stories we tell ourselves about our past are often very different from the reality, and we should have humility about that.” When I asked

him for examples, he mentioned the origin of “white people”—light-skinned people from Europe and parts of western Asia. He assumed (as did most scientists) that whites represented a stable lineage that had spread across western Eurasia tens of thousands of years ago and established a relatively homogeneous population. But his research showed that as recently as eight thousand years ago there were at least four distinct groups of Europeans, as genetically different from one another as the British are from the Chinese today, some with brown skin color. As he put it in an e-mail, “‘White people’ simply didn’t exist ~8,000 years ago.”

Around 500 B.C., the Greek traveler Scylax of Caryanda is said to have journeyed through parts of the Indian subcontinent and sailed down the Indus River. In his writings, known only from secondary sources, Scylax called the river Indos, from which the English name for the subcontinent derives. Alexander the Great invaded India in 326 B.C., having previously swept through what is now Afghanistan and Pakistan. His armies traversed the Indus plains and reached as far as the Beas River before turning back. There was lasting Hellenic influence in the region for centuries, although the eventual decline of Greek civilization largely brought direct contact with Greece to an end.

Perhaps, the Roopkund researchers thought, there might be a tribe or a group in India descended from Greeks. Alexander left behind commanders and soldiers in some of the territories he conquered, many of whom stayed. Members of the Kalash tribe, in northern Pakistan, claim to be descendants of Alexander’s soldiers. (This was the inspiration for Rudyard Kipling’s story



*for*

“You’re carrying a lot of tension.”

“The Man Who Would Be King.”) The Kalash are a distinct people with their own language and an ancient, animistic religion. Genetic research suggests that the Kalash have a Western European origin, and one disputed study found Greek heritage. On investigation, Reich’s team found that the modern genetic profile of the Kalash did not resemble that of Roopkund B. Two centuries before Christ, parts of northern India, Pakistan, and Afghanistan formed the Indo-Greek Kingdom, the easternmost state of the Hellenic world. But, again, Roopkund B didn’t resemble any populations living there now.

Could Roopkund B have come from an *unsampled* population in India descended from Greeks or a related group? In this scenario, an enclave of migrants to India never admixed with South Asians, and retained their genetic heritage. But the genetics of Roopkund B, showing no sign of isolation or inbreeding, ruled this out, too. And then there was the stubborn fact that the Roopkund B people ate a diet more consistent with the Mediterranean than with India. The evidence pointed to one conclusion: they were Mediterranean travellers who somehow got to Roopkund, where they died in a single, terrible event. And yet the historians I consulted, specialists in South Asian and Greek history and authorities in the history of Himalayan mountaineering, said that, in recent centuries, there was no evidence of a large group of unrelated people from the eastern Mediterranean—men and women—travelling in the Himalayas before 1950.

Since the study was published, one of the most determined investigators of the mystery has been a recently retired archeologist named Stuart Fiedel, whose main research focus is the migration of Paleo-Americans into the New World from Asia. “I hate unsolved mysteries,” Fiedel told me. “It makes zero sense that a party of male and female Greek islanders would be participating in a Hindu pilgrimage around 1700 or 1800. That’s because, one, there is no documented presence of any substantial Greek communities in northern India at those times, and, two, there is no record of Europeans converting to Hinduism or Buddhism in those periods.”

He sent Harney and Reich a string

of e-mails proposing alternatives to the Mediterranean theory. Fiedel contends that the mitochondrial DNA lineages and the Y-chromosomal DNA lineages of the Roopkund B group are rare or absent in the population of the Greek islands, but are relatively common in Armenians and other peoples of the Caucasus. His preferred hypothesis is that the Roopkund B people were Armenian traders. Armenians travelled widely in Tibet, India, and Nepal during the seventeenth and eighteenth centuries, trading in pearls, amber, and deer musk, a precious ingredient in perfume. Several large Indian cities have Armenian communities that go back centuries. “They might have been hanging with some major Hindu party trying to sell them stuff,” Fiedel said. Noting that nothing of value was found on the bodies, he speculated that the travellers were killed by Thuggees, a cult of robbers and murderers whose fearsome reputation in British India gave us the word “thug.” Thuggees were said to attach themselves to travellers or groups of pilgrims, gaining their trust and then robbing and murdering them on a remote stretch of road. “The Thuggees would make off with kids,” Fiedel said. “Everybody in the Roopkund B population is mature. There isn’t any gold on the skeletons, no rings, necklaces, or anklets on the victims. Who removed those things? And they were dumped in water. The Thuggees would dump people in water.”

Reich and Harney reject Fiedel’s genetic interpretation. Reich wrote back to him saying that the full DNA from Roopkund B was “extremely different from Armenians both modern and ancient.” What’s more, scholars increasingly view British reports about Thuggees as inaccurate or embellished, reflecting the colonialist fear and incomprehension of the country they occupied. Some historians question whether the Thuggees even existed.

Reich and Fiedel did agree, however, that Sax’s suspicion that the bones could have simply been mixed up was unsustainable. A jumble of bones from a poorly curated storage area would not have the consistency of age, type, diet,

and genetics displayed by the Roopkund B remains. The data would be all over the map. Besides, even if these bones were proved to have been mislabelled, that would merely create another mystery: how did a bunch of eighteenth-century Greek bones get into a storage vault in India?

For the time being, Roopkund holds its secrets, but it remains possible that an answer will eventually be found. Veena Mushrif-Tripathy, a bioarcheologist on the previous study and a co-author of the new one, pointed out that Roopkund is so remote and inhospitable—in 2003, when she and her colleagues went to collect bones, altitude sickness forced her to turn back—there has never been

a systematic archeological investigation of the site. All the bones studied so far have been picked up haphazardly, a flawed way of sampling that often skews results. A careful excavation, she believes, might solve the mystery, especially if it is able to plumb the lake itself. The water is frozen most of the year, so the skeletons and artifacts visible on the lake bed have been kept safe from looters and souvenir hunters. “Inside the lake, you can get more preserved bones with soft tissues,” she said. “And if they are Greek people we should get some artifacts or tools or something which we can trace back to Greece.”

And what of Nanda Devi? The new study established that multiple groups had died at the lake centuries apart. Did everyone die in hailstorms? Mushrif-Tripathy thinks that a hailstorm was probably involved in one mass death but that most people had likely just died of exposure. According to Ayushi Nayak, who performed the isotopic bone analyses at the Max Planck Institute, Hindu pilgrims sometimes go barefoot and thinly clothed to sacred sites in the Himalayas as a spiritual challenge. Completing the pilgrimage in this way is a sign that the goddess favors you and wants you to survive. In other words, most of the Roopkund dead probably perished as Sax almost did, when he was an undergraduate—staggering around in a sudden blizzard and looking for their companions. ♦

