



**DR. APRIL NOWELL** with a versatile hand axe — like a Swiss Army knife from the Stone Age — discovered in Jordan.



# Stone Age Kitchenware

**Based on the the tools they used, our ancestors seem to have had a much more varied diet than thought**

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PHOTOGRAPHY BY NIK WEST, BA '95

**E**veryone likes a good buffet. Even — according to forensic analysis of ancient stone tools discovered in the deserts of Jordan — our hominin ancestors of 250,000 years ago.

Dr. April Nowell, a paleoanthropologist and professor in the Department of Anthropology, originally set out to uncover the story behind the early extinction of the Azraq Neandertals. “In order to understand why they died out, I needed to understand how they were living,” says Nowell. She ended up discovering a host of animal protein residue on ancient hunting and butchering tools excavated from the Azraq Marshes in Jordan. What these tools tell us is that inhabitants of the once lush oasis scavenged or hunted a variety of animals, from duck to horse to rhinoceros.

When news of the discovery was announced this summer, it generated international media buzz because it gives us a much better understanding of how our ancestors lived. More importantly, Nowell’s research points to a surprising degree of sophistication from a social, cognitive and technological viewpoint.

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Above: Amer Al-Souliman of Hashemite University, Jordan (right) with UVic grad students Jeremy Beller (left) and John Murray. (Photo courtesy of Beller and Murray.)

Opposite page, left: A blade that tested positive for rhino residue. Right: A blade with camel residue. Other specimens tested positive for horse, rhino and wild cattle. (Images from April Nowell.)

“I decided when I was 16 that I wanted to be an archaeologist,” says Nowell. “It sounds so nerdy but I’d watch these documentaries on PBS, *In Search of Troy*, and all that kind of stuff...and I thought, ‘That’s what I want to do.’” Her first field site was in her hometown, in the heart of Old Montreal, followed by fieldwork in Belize, the Canadian High Arctic, Ontario, France and Spain.

Her career path led her to the excavation sites of the Azraq Marshes Archaeological and Paleoecological Project, at the “crossroads of Africa, Europe and Western Asia.” What was once a lush marsh teeming with plant and animal life is now a windswept desert, punctuated with grand castle ruins, its vastness broken up by long stretches of highways teeming with transport trucks. Directly across from one of Nowell’s work sites is a castle that served as the 1917 home base to author and

British military officer, T. E. Lawrence, better known as Lawrence of Arabia.

The team’s home base is just five minutes away, a place Nowell has arranged through her connections with locals in the small town of Azraq. The archaeologists emerge from their mosquito net-draped cots before dawn in order to avoid the grueling heat of the midday sun. Long hours hunched over a plot of dirt are made less tedious with word games and rounds of singing. Very little dirt is moved over the course of a summer. “Maybe five square meters in a month,” says Nowell.

“It becomes a tortuous game of gently picking each grain of sand away one by one,” says John Murray, one of Nowell’s graduate students. He found himself working the site in Jordan less than a month after sending Nowell a “cold call email” about joining her team. “Finding awesome artifacts is one of the most amazing feelings in the world.”

The excavators keep themselves fueled with snacks that are as repetitive as their careful brush strokes. “I tend to avoid peanut butter for a few months after fieldwork because it’s definitely a staple,” says Murray, who describes fieldwork as, essentially, a “prehistoric forensic case” that has been reopened by “detectives of the past.”

Regardless of profession, reopening a case comes with challenges. For Nowell, this was getting her dating samples out of the country intact. Archaeologists use optically stimulated luminescence (OSL) testing to date each layer of earth — essentially determining when the soil was last exposed to sunlight. In order to preserve the integrity of the light-sensitive samples, the team often drilled their boreholes in the cover of night.

“So here we have these soils samples, in a piece of pipe basically, that we want to get from the Middle East to Oklahoma and we’re saying, ‘Oh, you can’t x-ray these.’”

Nowell’s team used a safety-in-numbers approach to the border crossing, shipping out multiple samples with the hope that they wouldn’t all be opened and inadvertently exposed to light. “It was the luck of the draw,” says Nowell. And it worked.

**Nowell's third-floor office** in the Cornett Building is compact and tidy. Replica figurines and ivory art line shelves that are stacked high with books. Hanging on the wall is a poster of the Venus of Hohle Fels, one of the oldest figurines in the world and the subject of a TEDx talk Nowell recently gave called Paleo Porn. Her lab, just down the hall, is home to hundreds of artifacts, all stored meticulously in individually labeled bags. Her tools of the trade: calipers, electronic scales and a microscope with a built-in camera.

It's much less exciting than one would expect from a profession that conjures up icons such as Indiana Jones and Lara Croft. Nowell doesn't mind the jokes when she tells people she's an archaeologist. "It gets people excited about what we do." But she does want to clear up one misconception. "We actually excavate sites," she says with a laugh. "We don't loot them."

While the idea of hunting for long-lost treasures might capture the attention of thrill-seeking tweens everywhere, it is clearly Nowell's passion and skill as a teacher that keeps her classrooms full. The students, several of whom are of the silver-haired generation, clearly come to her classes, not for credit, but out of interest.

Aurora Skala, MA '15, an archaeologist and First Nations researcher, says that Nowell's Paleolithic art class actually planted the seed for her own research into the hidden imagery in the Heiltsuk and Wuikinuxv Territories. "There are a handful of university classes I have taken which dramatically changed how I see the world," says Skala, "and hers was one of them."

**Crossed immunoelectrophoresis (CIEP) is a biochemical test** that can detect the presence of any given protein, such as proteins found in remnants of a lion's blood on a spear head. It is commonly used in the forensic field but underutilized in archaeology. It's also very expensive.



Looking for protein residue on the Azraq stone tools wasn't even on Nowell's radar. The oldest stone tool that had been successfully characterized with CIEP right down to animal species was only 11,500 years old. So when her colleague, Dan Stueber, a lithic technology specialist, suggested they send off a few pieces for residue testing, Nowell was skeptical. "Why would we do this? There's no way," she thought.

Despite her doubts, Nowell sent six carefully chosen artifacts for CIEP testing. One tested positive for horse protein residue. It was a huge surprise. "When I got that email from the lab, I think I screamed," says Nowell. "Everyone was over the moon excited."

The significance of the Nowell team's discovery is two-fold. First, success with CIEP means that other archaeologists can use the same technique on artifacts as old or potentially older than the Azraq tools. And for archaeologists, this means, a much richer picture of what our ancestors were doing.

Nowell's findings also offer insight into ancient human development. It takes incredibly sophisticated behaviors to organize little task groups to go out and get water and gather plants, but taking down large animals raises the bar significantly. "Hunting a duck is very different from how you might hunt or scavenge a rhino," explains Nowell.

Evidence that hominins were chowing down on such a wide variety of animals also validates the story of evolution as the story of a generalist. Modern day humans exalt in the culinary pleasures of diversity. Our ancestors' wide-ranging food choices were born out of necessity.

"We've evolved to eat anything and everything," says Nowell. "That's why we've survived so well." †

