



Searching for Syphilis

The bones of Rivenhall women.

Narrator:

Arguments over whether Columbus brought syphilis home from the New World have caused one of the longest running controversies in medical history.

Finding evidence of syphilis in Europe before his return would not only clear Columbus's name but could lead to a better understanding of the early origins of the disease.

Venereal syphilis is caused by a corkscrew-shaped bacterium called *Treponema pallidum*. It's an organism superbly adapted to its human host.

Sheila Lukehart:

This is one of the smartest bugs I know. It can survive inside a host that has a really active immune response for decades. So it's clearly figured out what it needs to keep and do in order to be a successful pathogen it's one of the most successful pathogens around.

Narrator:

Treponemal diseases like syphilis can cause changes in a victim's bones. Tell-tale damage which is preserved after death. But despite the many thousands of archaeological excavations that have taken place in Europe, pre-Columbian skeletons with undeniable signs of the disease have been notoriously difficult to find. Until now.

Simon Mays:

I came across the skeleton when I was looking for some material for a student to work on, and the box said Rivenhall on it and I was surprised to see that because the material that we had from that site, I thought had all been reburied. It was clearly a case of treponemal disease, as soon as I looked at the bones, it was clear that this was a diseased skeleton, and one can only assume that is the reason why it was kept back.

Narrator:

Rivenhall is a country churchyard in Essex. More than two hundred burials were excavated from the site back in the 1970s.

Simon Mays:

The churchyard at Rivenhall was in use for a long period of time and the archaeological stratum that this one came from could only date it to between the thirteenth and the seventeenth century A.D. What I was primarily interested in, was whether this specimen predated the Columbus voyage, or whether it was post-Columbian in origin, and the only way to address that was to do a radio carbon date on the material.

Narrator:

Mays sent a sample of bone for radio carbon dating. The results were amazing.

Simon Mays:

When the radio carbon date came back it showed very clearly that it was in fact pre-Columbian, which made it a very important specimen indeed.

Narrator:

Rivenhall woman had lived sometime between 1295 to 1445. She had died at least 50 years before Columbus returned from the New World. Could she be proof that syphilis was in Europe before Columbus?

Narrator:

The disease we know as syphilis has two very close cousins - Yaws and Bejal. Both are non sexually

transmitted and are mainly childhood diseases often caught by skin-to-skin or mouth-to-mouth contact. Yaws usually occurs in the Tropics. It prefers hot, humid conditions.

Bejal, sometimes called endemic syphilis, prefers more arid parts of the world with hot but dry climates. The problem for archaeologists is that all three treponemal diseases are capable of causing very similar damage to human bone. So which of the three diseases did Rivenhall woman have?

Simon Mays:

Right, this is the skeleton of the Rivenhall lady. She was about twenty five to fifty years old when she died, and the skeleton shows clear signs of treponemal disease.

We can see here that this is what the bone surface should look like - this is the normal smooth appearance of healthy bone but we can see in this part of the bone here, there's a great deal of roughening and pitting and the bone itself is swollen as well and that's the response of the bone to the inflammation that's caused by the treponemal disease that this individual had.

We can see the changes even more dramatically in this bone here, this is the left tibia, the bone from the left lower leg, and we can see the bone is greatly expanded by new bone deposits on the outside there.

There's a lot of new bone deposition and a lot of pitting and bony reaction, and that's exactly the kind of change that one would expect to see in treponemal disease.