



Montagnier to study "magnetic waves" from DNA

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Q&A with author of arsenic bacteria paper

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Full assault. The Republic of Congo is vaccinating adults as well as children.

fecal and other samples were not collected at the outset, which has hindered subsequent efforts to reconstruct exactly what happened, he says. Even now, samples are just trickling in, and many are of very poor quality, he says. As a result, the polio labs in Kinshasa, Johannesburg, and CDC have virologically confirmed only about two dozen of the suspected cases—and some will never be confirmed, Pallansch says.

Genetic analysis has determined that the culprit is a wild poliovirus type 1 that somehow jumped from northwest Angola to Congo in a single importation. That virus, in turn, came from India several years ago and has been circulating in Angola ever since—and has also recently spread from there to D.R.C., where a separate and distinct outbreak is under way. In Angola and D.R.C., it is behaving like "garden variety" polio that strikes young children, says Nathanson. "If it is the same type 1 from Angola and India, how can it be behaving so differently" in Congo? he asks.

Nathanson wonders whether something in addition to polio is going on in Congo-Brazzaville—perhaps a simultaneous outbreak of another deadly virus with another route of transmission, although searches for other strange viruses have so far come up empty. Until more research is complete, "I reserve judgment as to what is going on," he says. CDC and WHO have rushed in teams of epidemiologists to help country authorities investigate.

Outbreaks among adults are not unheard of—one in Namibia in 2006 was traced back to inadequate routine vaccination some 16 years earlier. But there had been no such breakdown that anyone knew of in Congo. Looking back, says Pallansch, there was some political instability in the mid-1990s around Pointe-Noire. "So maybe there was a disruption in vaccination during that time to explain the adult cases. Maybe, but it doesn't line up nicely as it did in Namibia," he adds. And what explains the concentration of cases in males—more than 67% of all cases? To Aylward, that's the most interesting question.

As for why it is so deadly, Pallansch says there are a couple of possibilities. When polio does strike adults, it tends to be more severe, progressing more often to the bulbar form of

INFECTIOUS DISEASE

Polio Outbreak Breaks the Rules

Polio is a horrendous disease, but it is seldom fatal—except now. An explosive outbreak in the Republic of Congo is writing another chapter in the book on how this ancient scourge behaves.

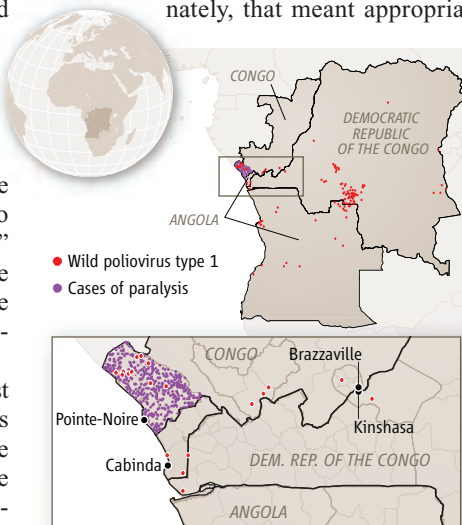
Polio usually strikes children under age 5, paralyzing one in 200 of those infected and killing at most 5%, occasionally up to 10% in developing countries. The new outbreak tearing through this West African country has so far killed an estimated 42% of its victims, who, in another unusual twist, are mostly males between the ages of 15 and 25. Since it began in early October, the outbreak has paralyzed more than 476 people and killed at least 179, according to World Health Organization (WHO) estimates from early December, making this one of the largest and deadliest polio outbreaks in recent history. And one of the most mystifying, too, says polio expert Neal Nathanson of the University of Pennsylvania: "There are too many things that don't fit or are unexpected."

"We are scratching our heads," says Bruce Aylward of WHO in Geneva, who runs the troubled 20-plus-year, \$8 billion global program to eradicate polio (see p. 1736).

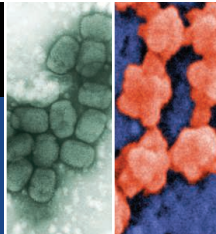
When cases of acute flaccid paralysis first cropped up among adults a couple of months ago in the oil-rich city of Pointe-Noire on the Atlantic coast, no one suspected polio. The Republic of Congo—also known as Congo-Brazzaville to distinguish it from the Democratic Republic of Congo, its larger and

unrulier neighbor to the east—had rid itself of polio in 2000 through countrywide campaigns to vaccinate each and every child. Since then, routine immunization has kept Congo-Brazzaville polio-free, even when outbreaks swept neighboring Angola and D.R.C. "It was not considered at high risk. That is why we were all surprised," says Mark Pallansch, who is leading efforts to analyze the virus at the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta.

"Because this is not a typical outbreak that occurs in children, people initially looked for another cause," Pallansch says. Unfortunately, that meant appropriate

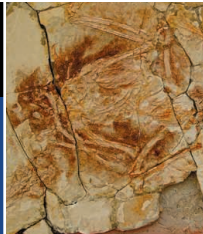
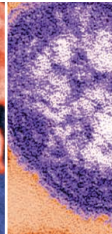


One hop. The virus jumped from Angola to Congo.



Candidates for eradication

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China's faked fossils

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the disease, which leads to cardiac or respiratory failure. But that may typically happen in 10% of adult cases, or perhaps even 20%, says Nathanson, but nothing to rival the figure in Congo. One theory being investigated is that there is some confounding factor among those who died versus those who didn't: "Did they have an underlying health problem? Were they all from the same location?" asks Pallansch. The other, disturbing possibility is that the Republic of Congo is in the midst of a much, much bigger polio outbreak and somehow the milder cases have been missed.

"Everyone's got an opinion. But there are few data," says Aylward. "You can pull together a story, but will you ever be able to

prove it? It will be hard retrospectively to put all the pieces together."

All agree that the first priority is to snuff out the outbreak before the virus reinfects other countries. It is already spreading: Cases have been confirmed in the capital, Brazzaville, some 650 km to the east of Point-Noire, in Cabinda, a sliver of Angola that juts out into the Atlantic south of Congo, and in the adjacent province of D.R.C., Bas Congo. Massive emergency campaigns are under way to vaccinate the entire population, all ages, in Congo and in neighboring parts of Angola and D.R.C. They seem to be bringing the outbreak in check, says Pallansch: "The population is scared, so there is demand for the

vaccine." Aylward predicts that the outbreak will be under control in 3 to 4 months, if there is enough money—in November, WHO and partners issued an emergency appeal for \$23 million—and vaccination campaigns continue to go well. But there are no guarantees.

Even if Aylward is right, the outbreak has raised a new, disturbing question, says Pallansch. Is the Congo-Brazzaville epidemic an anomaly, or does it suggest there are other polio-free parts of Africa with susceptible adult populations that would also be ripe for a explosive epidemic? "We don't know where the susceptibles are," says Aylward—"where the next Congo could be."

—LESLIE ROBERTS

SCIENCE EDUCATION

Court to Weigh University's Decision Not to Hire Astronomer

Is it possible to separate religious and scientific beliefs when it comes to evolution? A federal court will take up that question early next year in the case of Martin Gaskell, an astrophysicist who claims that the University of Kentucky (UK) denied him a job because he is an evangelical Christian.

Pro-evolution advocates say the university was well within its rights. "It's an employment law case," says Eugenie Scott, executive director of the National Center for Science Education, an organization in Oakland, California, that lobbies to preserve the teaching of evolution in public schools. "Can an employer discriminate based on the scientific knowledge of an employee?" she asks. "Well, yeah."

But the case could be more complicated. "It's a rather intriguing case," says Ehrich Koch, an attorney in Minneapolis, Minnesota, who represented a school district whose reassignment of a biology teacher who declined to teach evolution was upheld. "It appears as though what the court is saying is both sides have arguments, and they may be able to prove their case."

On 23 November, Judge Karl Forester of the U.S. District Court for the Eastern District of Kentucky ruled that UK's motivation for rejecting Gaskell "remains hotly contested" and needs to be examined by a jury. Gaskell is seeking damages for lost income and emotional distress.

Gaskell, 57, had recently moved from

a nontenured position at the University of Nebraska to a research fellow post at the University of Texas's McDonald Observatory when he applied to head Kentucky's new observatory in 2007. During the search process, a UK committee member discovered an article on Gaskell's personal Web site titled "Modern Astronomy, the Bible, and Creation."

The article, based on talks Gaskell had given, "appeared to blend science and religion," according to a brief filed by the university. The dean of the college decided that "since Gaskell's viewpoint was discussed in a scholarly paper, the committee should consider whether his statements were 'good science,'" according to the brief.

Gaskell, who was one of three finalists, didn't get the job, and in 2009 he sued the university. In its legal filings, UK says that although there were other reasons Gaskell wasn't hired, "his apparent inability to separate his personal or religious beliefs from his scientific comments ... raised concerns."

In an e-mail to *Science*, Gaskell called himself an "old earth theistic evolutionist," a label that deems evolution a tool God used to develop life. In his deposition and

his e-mail, Gaskell says he is not a creationist or a subscriber to intelligent design, both of which, to varying degrees, discount natural selection. However, his lecture notes cite work by astronomer Hugh Ross, who embraces an old Earth, as geologists do, but rejects evolution as the guiding principle for life.

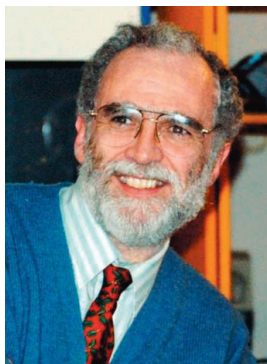
"I had no trouble with the natural selection process," Gaskell said in his deposition. But "when it comes to trying to explain everything, and particularly the origin of life, ... we just don't have any satisfactory theory."

Jennifer Wiseman, an astrophysicist who has known Gaskell professionally for 20 years, says she doesn't consider Gaskell a creationist. "He doesn't discount or disbelieve evolution," says

Wiseman, who directs the Dialogue on Science, Ethics, and Religion program at AAAS (which publishes *Science*). A religious scientist who cites ongoing puzzles in evolution sets off more alarms than when an atheist makes the same point, she believes.

The trial is scheduled to begin on 8 February. On 1 March, Gaskell begins work as a professor at the University of Valparaiso in Chile.

—JENNIFER COUZIN-FRANKEL



In court. It's astrophysicist Martin Gaskell versus the University of Kentucky in February.

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