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SCIENCE
Notebook

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Ancient Skull Gives Credence To 'Out of Africa' Hypothesis

The 36,000-year-old skull of a human who lived in what is now South Africa bears striking similarities to skulls from the same period found in Europe and western Asia -- giving support to the "Out of Africa" hypothesis that says modern humans came fully developed out of sub-Saharan Africa.

The skull, from the town of Hofmeyr, was uncovered 50 years ago, but its importance was only recently established by a team of researchers from Stony Brook University in New York. The team established the fossil's age -- which filled a significant void in the human fossil record in Africa in the period 70,000 to 15,000 years ago -- by measuring the radiation that had been absorbed by sand grains that filled the braincase.

Researchers from the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, then took measurements of the skull that are used to differentiate recent human populations, according to their geographic distributions and genetic relationship. Based on that information, they concluded that the South

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 An artist's rendering of a skull found 50 years ago in South Africa. It has plenty of say.

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African skull is similar to skulls of humans from the same Later Stone Age period in Europe, when anatomically modern people first appeared there but were different from aboriginal people now living in southern Africa.

Lead researcher Frederick Grine said the findings support the thesis that ancient Eurasian humans migrated north from sub-Saharan Africa, and undercut the competing hypothesis that non-African groups such as Neanderthals made an important contribution to the genetic makeup of modern humans.

The paper appeared in the Jan. 12 issue of the journal Science.

-- **Marc Kaufman**

Bacteria Make Fine Machines When the Job Is Small Enough

Say you want to gently mix tiny amounts of fluids in nearly microscopic tubes. Even the smallest pump would overwhelm the system, and no one makes propellers or sloshing machines that small. Who you gonna call?

Bacteria, say a pair of researchers who use their talents in engineering and microbiology to recruit microbes into the scientific labor force.

Min Jun Kim of Drexel University and Kenneth S. Breuer of Brown University were aware of a growing market for "microfluidic" laboratory instruments -- blood analyzers and other machines that work by mixing chemical reagents together and are so miniaturized that the fluid tubes are as thin as hairs. At that scale, liquids behave oddly and do not mix well without extra help.

They also knew that several kinds of bacteria, including the ubiquitous gut microbe *Escherichia coli*, propel themselves with the help of tiny whiplike appendages called flagella. These filaments can rotate clockwise -- driving the bacterium forward at speeds of one-thousandth of an inch per second -- or counterclockwise, which makes a microbe tumble so it can move in a new direction.

An artist's rendering of a skull found 50 years ago in South Africa. It has plenty of say.

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In experiments, the scientists showed that a tiny dose of bacteria could double the rate of the fluids' mixing in microchannels. When the fluid was spiked with a chemical that excites bacteria, the rate doubled again.

Bacteria "provide a natural mechanism for achieving mixing," the team concludes in the current Web edition of the journal *Analytical Chemistry*.

-- **Rick Weiss**

Parasitic Infection Is Found To Benefit MS Patients in Study

Patients with multiple sclerosis who also happen to have an intestinal parasite appear to have significantly fewer relapses and better outcomes than other MS patients, a new study found.

The finding suggests that when the body's immune system is occupied with an external threat, it may be less likely to misfire, which happens in conditions known as autoimmune disorders. Multiple sclerosis is an autoimmune disorder that attacks the myelin sheath that protects nerve fibers.

The study tracked 12 multiple sclerosis patients who were found to have an intestinal parasite and compared them with 12 other patients. Over four years, there were stark differences. There were three relapses among the patients who had the intestinal infection and 56 relapses in the other group.

Patients with the parasitic infection also had minimal changes in disability scores compared with the other group, according to a study in this month's *Annals of Neurology* by Jorge Correale and Mauricio Farez of the *Ra?l Carrea* Institute for Neurological Research in Buenos Aires.

The study suggests that one reason for the apparent increase in autoimmune disorders in recent years could be the decline of infectious diseases in certain countries. Because parasites often cause long-lasting infections, the researchers hypothesized that such infections could make persistent demands on the body and thereby reduce the likelihood that the immune system will attack healthy tissue.

-- **Shankar Vedantam**

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