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Ideas

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Pages from an ancient Koranic manuscript, damaged by insects and worn with time, in the library of Ouadane, Mauritania

THE ORIGINS OF A HOLY BOOK

Using ancient texts, scholars have begun an audacious effort to unravel the story of the Koran. What will they find?

BY DRAKE BENNETT

LATER THIS SPRING, a team of scholars at Germany's Berlin-Brandenburg Academy of Sciences will complete the first phase of what will ultimately be an unprecedented, two-decade effort to throw light on the origins of the Koran.

The project, called the Corpus Coranicum, will be something that scholars of the Koran have long yearned for: a central repository of imagery, information, and analysis about the Muslim holy book. Modern research into Islam's origin and early years has been hampered by the paucity and inaccessibility of ancient texts, and the reluctance of Muslim governments in places like Yemen to allow wide access to them.

But, drawing on some of the earliest Korans in existence—codices found in Istanbul, Cairo, Paris, and Morocco—the Corpus Coranicum will allow users to study for themselves images of thousands of pages of early Korans, texts that differ in small but potentially telling ways from the modern standard version. The project will also link passages in the text to analogous ones in the New Testament and Hebrew Bible, and offer an exhaustive critical **KORAN, Page C3**

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Q&A

The lonely planet

New eco-threat: falling population

BY REBECCA TUHUS-DUBROW

IN 1968, STEWART BRAND founded the legendary Whole Earth Catalog, whose tagline promised simply "access to tools." Luring an audience that sought self-sufficiency, it quickly became a counterculture must-read. Though often associated with hippies, the Whole Earth crowd might be more aptly characterized as geeks. Reverential of science and suspicious of dogma, Brand helped forge a modern green ethos, centered on alternative technologies and smart design.

In the decades since, Brand has written a number of books and founded several organizations. His recent manifesto, "Whole Earth Discipline," is a lucid and provocative polemic, focusing on large-scale fixes for a planet in jeopardy. Some of his conclusions will strike many environmentalists as betrayals. But Brand sees them as outgrowths of the same pro-science pragmatism that informed his earlier work. He endorses, for example, nuclear power and genetic engineering, arguing that their potential benefits—for people and the environment—outweigh **Q&A, Page C4**

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BRAINIAC

Putting @ on a pedestal; an economist at the movies; and more **C4** For more, www.boston.com/bostonglobe/brainiac.

Our microbes, ourselves

We are home to whole worlds of bacteria. New research suggests that they can tell our history and, perhaps, our future.

BY COURTNEY HUMPHRIES



SEAN KELLY FOR THE BOSTON GLOBE

TELEVISION SHOWS REMIND us of the traces we can leave behind, clues that could link a criminal to the scene of a crime: a careless fingerprint, a spatter of blood, a stray hair. A recent study offers a new way to identify people that might sound far-fetched even to a scriptwriter: the bacteria on our skin.

Researchers from the University of Colorado found that when someone touches an object, they transfer bacteria that persist for days or even weeks. The team said it was able to recover the bacteria from computer keyboards and identify their owners from a database of more than 250 bacterial samples from human hands.

The technique may eventually have applications in forensics, but it also suggests a new way of looking at our identities. We usually **BACTERIA, Page C2**

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Bacteria

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think of ourselves as individual human bodies. But our bodies are in fact homes to complex communities of microbes that are integrally linked to us and have evolved alongside us. Your own unique communities begin forming at birth and are partially inherited from family members and partially shaped by your experiences and actions.

“The thing that’s intriguing to me is the possibility of a very different identifier of who you are as a person,” says David Relman, a microbiologist at Stanford University who was not involved in the research. Unlike DNA or fingerprints, which are fixed from birth, your particular mix of bacteria develops over time and “can potentially tell us about your behavior and life history, not just who you were born to be,” Relman says.

And these vast, invisible communities are more than just passengers, scientists suggest: They are a critical part of who we are. Microbes influence our health in far-reaching ways. Imbalances in bacterial communities are involved in conditions like eczema, psoriasis, gum disease, inflammatory bowel disease, celiac disease, and possibly even autism. And a growing body of evidence shows that bacteria play a role in obesity. It increasingly appears that microbes can communicate directly with our bodies by releasing chemicals that affect our own biology and even behavior. Some scientists argue that we shouldn’t see the human body as an individual entity but as part of a “superorganism” that includes all of its inhabitants living together.

“We have a symbiotic relationship with our microbes,” says Jacques Ravel, a microbiologist at the University of Maryland’s Institute for Genome Sciences.

THIS SHIFT IN thinking emerged from new technologies that made it possible to study microbes living in complex communities, rather than as isolated cells in a lab. These techniques were first used to study bacterial communities in soils, oceans, and other environments, but eventually scientists began exploring the habitat of the human body. So far, initial studies in this new frontier have revealed incredibly complex and active populations of microbes that seem to have an important role in many aspects of our health.

Scientists are now working to detect, categorize, and understand the entire complement of microbes living in and on the human body—what they call the human microbiome. A federally funded effort, called the Human Microbiome Project, is working to better understand the body’s microbes and our relationship to them. This, of course, involves delving into a hidden world that many of us might pre-



SEAN KELLY FOR THE BOSTON GLOBE

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fer not to think about. Microbes cover every surface of our bodies—they cling to our skin, form sticky films in our mouths, and build megalopolises in our digestive tracts. You may think you’re wiping them out when you wash your hands or shower, but in fact the communities quickly bounce back intact. The forensics study, published this month in Proceedings of the National Academy of Sciences, suggests that the items we handle frequently—our furniture, dishes, iPods, and clothing—could be coated in a living imprint of ourselves.

“In forensic science, you start realizing you’re

shedding yourself all the time—it really changes the way you look at hotel rooms,” jokes Robin Cotton, director of the biomedical forensic sciences program at Boston University School of Medicine. “And now this is going to make it worse.”

Cotton says that the method is far from ready for use in forensics, but that it might eventually be useful for confirming an identification made by other means. For instance, forensic scientists sometimes rely on “touch DNA,” the DNA found in small samples of human cells left behind on an object. In some cases, the amount of DNA that can be recovered is so small or damaged that the identification it produces is less reliable than investigators would like. In these cases, they could turn to bacteria to confirm the human DNA findings, or vice versa.

Just as bacterial communities could be used as a marker of identity in forensics, they could also serve as signs of disease. We depend on certain microbes for functions such as digesting nutrients, but we also depend on the overall balance of microbial communities to prevent infections and keep us healthy. For instance, obesity is associated with different types of bacteria in the digestive tract, and their levels change with weight loss. These bacteria not only help to digest food but produce chemical signals that can influence whether our bodies burn the energy from food or

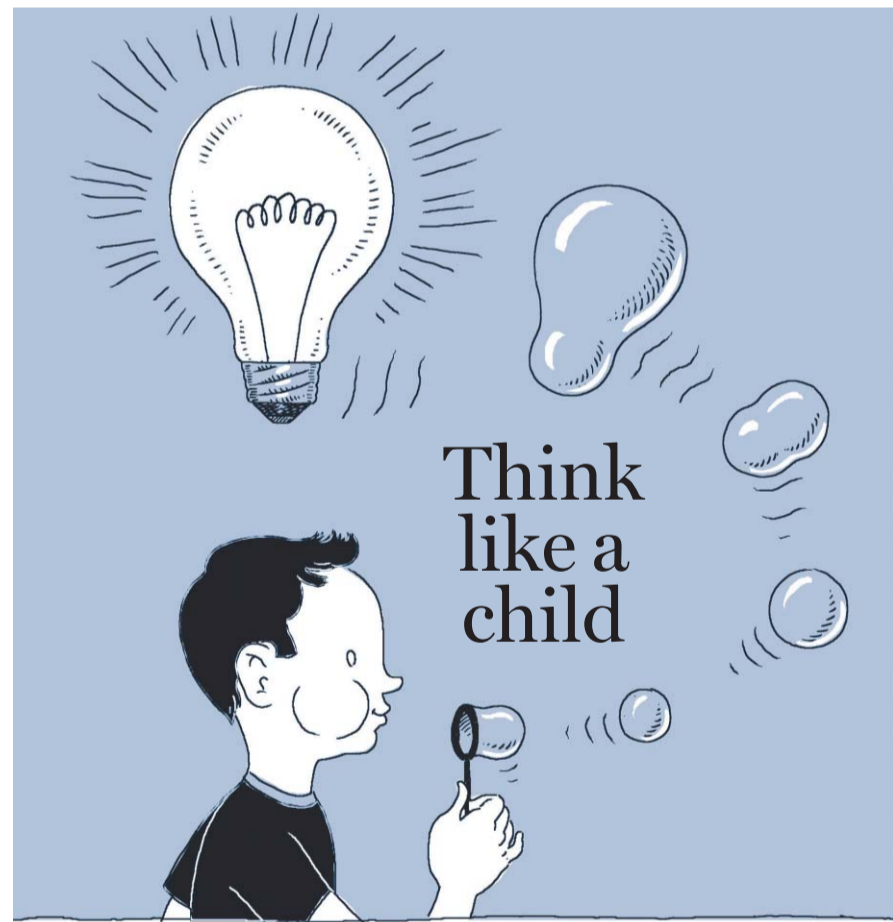
store it as fat. A recent study in mice found that bacteria in the gut may even help drive appetite. Ravel says it could some day be possible to test patients for microbial imbalances and give them treatments or recommend lifestyle changes to restore equilibrium.

That bacteria can have far-reaching influence on our biology requires us to view microbes in a new light. Most people consider bacteria to be agents of disease, and we don’t stop to consider the consequences of taking antibiotics or slathering on antibacterial lotions. Rob Knight, a microbiologist at the University of Colorado and coauthor of the new study, says that a better approach is to think about “how to tend your unique microbial garden.” So far, we’ve been treating it with the equivalent of bulldozers and pesticides; there might be a better way to cultivate communities of bacteria that aid our health.

Knight says that studying the microbiome requires a more ecological view of the human body. The body is essentially a living island, with its own topography housing billions of inhabitants, which interact with one another and their host. Bacteria outnumber our own cells 10 to 1. Our understanding of our microbial selves is just beginning. But for now, we can take comfort in the fact that we’re not alone. Perhaps man is an island, but a very crowded one.

UNCOMMON KNOWLEDGE

SURPRISING INSIGHTS FROM THE SOCIAL SCIENCES | BY KEVIN LEWIS



WESLEY BEDROSIAN FOR THE BOSTON GLOBE

IN BOOKS AND movies, children are often the ones who see the truth before everyone else does. In real life, too, it’s no secret that adults often have trouble thinking outside the box. With this in mind, psychologists wondered if they could make college students more creative just by telling them to think like children. The students were asked to imagine that school had been canceled for the day and to describe how they would react. Half the students were also told to think about the situation as if they were 7 years old. These students subsequently generated more creative responses.

Zabelina, D. & Robinson, M., “Child’s Play: Facilitating the Originality of Creative Output by a Priming Manipulation,” *Psychology of Aesthetics, Creativity, and the Arts* (February 2010).

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The beauty of doing the right thing

IF YOU’VE EVER been too eager to trust a good-looking person, maybe it’s just because you’re hard-wired that way. Psychologists scanned women in an MRI machine while they rated the attractiveness of men’s faces; the women were also scanned while they rated the morality of various behaviors. The medial orbitofrontal cortex, a part of the brain which is known to process reward, was more activated when thinking about either an attractive face or a moral behavior. Conversely, the insula, a part of the brain which is known to process disgust and suffering, was more activated when thinking about either an unattractive face or an immoral behavior. This pattern suggests that the brain thinks about beauty and morality in the same way—as rewarding stimuli—whereas ugliness and immorality are tantamount to punishment.

Tsukiura, T. & Cabeza, R., “Shared Brain Activity for Aesthetic and Moral Judgments: Implications for the Beauty-Is-Good Stereotype,” *Social Cognitive and Affective Neuroscience* (forthcoming).

Opposing the editorial page

IN A WIDELY covered incident in the summer of 2008, The New York Times came under fire for rejecting an op-ed by Senator John McCain that was submitted in response to an op-ed by Senator Barack Obama that the newspaper had published. To conservatives, the incident epitomized liberal bias in the mainstream media. To test this proposition, researchers at Yale University randomly sent a pro-Obama or pro-McCain letter—saying the same thing, but with one or the other name—to 100 large newspapers around the country in October 2008. One-third of the newspapers receiving the pro-McCain letter expressed interest, but only one-fifth of the

newspapers receiving the pro-Obama letter expressed interest. Newspapers were more likely to express interest in a letter if it went against the position expressed by their editorial page, which explains the greater interest in pro-McCain letters, since Obama was endorsed by more of the newspapers. This suggests that editorial page editors are driven more by a desire for balanced and contrarian reporting than sheer bias.

Butler, D. & Schofield, E., “Were Newspapers More Interested in Pro-Obama Letters to the Editor in 2008? Evidence from a Field Experiment,” *American Politics Research* (March 2010).

The mental cost of video games

BEFORE BUYING THAT new video game for your child, read on. In “the first randomized, controlled test of the effects of video-game ownership,” researchers offered video game systems to parents of boys in elementary school who didn’t already have a system. Another group of families didn’t get a system (until the end of the study, as a reward). Boys who had a system spent less time on academics after school and lagged their peers in reading and writing. The only good news was that math skills didn’t suffer, but the authors note that this is probably because there are fewer after-school math activities for video games to displace.

Weis, R. & Cerankosky, B., “Effects of Video-Game Ownership on Young Boys’ Academic and Behavioral Functioning: A Randomized, Controlled Study,” *Psychological Science* (forthcoming).

The morality bank

WHEN ARE PEOPLE more likely to suffer ethical lapses—after careful consideration, or in the heat of the moment? According to a recent study, snap decisions tend to be more ethical ones. The study showed having more time to deliberate led business students to make somewhat less ethical decisions. People also tended to follow an ethical decision with a less ethical decision, and vice versa, producing a back-and-forth of relatively ethical and unethical decisions. This was true even when the initial decision—either ethical or unethical—was made for them, suggesting that people act as if they have a morality bank account, earning and spending moral credit. The authors advise that “managers should not tell people to think about the ethical implications of their choices” nor “flatter their co-workers: Telling people that they are ethical might give them moral credits that they can use to justify their subsequent unethical decisions.”

Zhong, C. et al., “Compensatory Ethics,” *Journal of Business Ethics* (March 2010).



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