Letter From the Desk of David Challinor
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As we age, we can contemplate not only the changing landscape but, equally fascinating for me, how people's attitudes have altered. There is only one certainty: changes will occur. We may speculate on future change but cannot be certain of the outcome: will the change be for better or worse? Whether and how we adjust to an inevitable future living under different conditions will test our flexibility as a species. Humans are extraordinarily adaptable and will undoubtedly take in stride whatever changes occur. This month's letter will consider how we became so amazingly adaptable and, to explore more deeply that question, we first asked: how do we know we are human?

When asked recently how we know we are human, my immediate unthinking answer was that we were told we were by our parents, and they by their parents, and so on. My outrageously simplistic answer dissatisfied me (as it should have) for it ignored all science and the complicated quality of human nature. Scientists from many different disciplines are exploring who we think we are as humans, concentrating on two issues to be resolved; first, whether our complex human nature is built-in and genetically wired, or is it gained piecemeal by experience? The question in a different form is—"nature or nurture?" Does our genetic makeup or our environment primarily determine who we are? This dichotomous approach goes back at least to the Greek philosophers, whereby Plato proposed that we are born with an innate knowledge; conversely, Aristotle thought that we must learn all that we are. This debate continues today, but from my perspective, I think our nature is a combination of the two, with the proportion between them still undetermined.

In considering the first question—"nature or nurture"—we must remember that although it is becoming evident that we are subject to both forces in various complicated and interactive ways, the political consequences of the argument have affected and, indeed, cost the lives of millions of people during the past few thousand years. Consider Hitler's goal to "breed" a super race and the consequences that befell those who did not meet those standards. Although Hitler and his cohorts mistakenly followed what they thought was a valid scientific conclusion (that genes could be manipulated in human reproduction to produce an "ideal" person), they were not scientists and thus failed to understand how complicated genetics is. Scientists of that time must bear some responsibility for the slaughter that followed because they failed to publicize the Nazis' erroneous conclusions.

We have now reached the point, however, that I raised in my introduction. We are witnessing a major change in which genes versus environment, persons versus their culture, innate abilities versus acquired ones are no longer separate conditions. Instead, our brains, our bodies and the cultures in which we live now seem to be integral parts of our humanness. Because we are human, we have a limited number of genes and, furthermore, our culture prescribes the environment in which we live.

Recent research on infant minds by Alison Gopnik at the University of California at Berkeley, indicates that we are born with complicated ideas and an amazing innate ability to learn more. Babies not only seem to have a "theory" about the world, but can use their surroundings to alter that theory. For example, a 42-minute-old baby can imitate an adult's face close to it. (Babies' eyes can only focus about a ½ m. away.) The baby in this experiment even stuck out his tongue when he saw the adult do so. In other words, the baby can "map" what it sees on another's face onto its own, despite being too young to recognize itself when looking in a mirror. From birth, babies also distinguish sounds and can tell a familiar human voice and face from an unfamiliar one. Measurement of brain development (a proposed quality of being human) is becoming increasingly sophisticated; scientists are gaining deeper insight into how humans handle such complex concepts as trying to understand another person's beliefs—something hidden inside the mind. Such ability is not attained until a person is more mature, but we do know that two- or three-year-old children cannot lie. Although they may understand the strategy of lying to escape punishment, they do not know how lying really works, a talent that does not develop until about age four. All these developments build upon each other so that for someone of my age (82), there is virtually nothing left of the first developmental brain processes.

One of the most contentious aspects of human nature is the existence of free will, for on this subject neuroscience seems to be in conflict with religious beliefs that postulate an independent "immortal soul" dwelling in the human body. Is there such a separate thing as free will that enables us to make independent, moral distinctions—an attribute confined to humans and supported by many religions; or is our response to a moral issue, our decision to take a specific action, merely the result of the mechanical firing of the neurons in our brains? Believers in the concept of free will believe our soul enables us to distinguish right from wrong, good from evil and guides us in making moral judgments. Scientifically, the existence of a soul or spirit is still open to question, but our understanding is progressing. For example, we know that we can think without being conscious of doing so; thus we see an object and recognize it immediately. Smells are also unconsciously processed through our brains and can trigger the release of hormones. The neuroscientist's approach, however, is that "one's self, as apprehended introspectively and represented incessantly, is a brain-dependent construct."[*]

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[*] Patricia Churchland in Brain-Wise, MIT Press (2002)

Others, such as philosopher Daniel Dennett at Tufts, find free will compatible with determinism and a result of evolution. He believes that the reliability of the deterministic worlds (the workings of our brains) allows us to extract or process information gained by our brains and thereby plan ahead to face disasters or form the basis for making moral choices as they inevitably arise. This ability has grown with language and writing and moves us ever further from our fellow mammals. When asked whether he thought the unbelievable growth of knowledge about our brains might cause some to continue behaving "badly" because they were genetically programmed to be that way and thus not really accountable for their actions, Dennett responded that although there may indeed be some individuals truly not responsible for their behavior, he believed that the number of such people is minimal. Most people, he believes, prefer to be responsible, because they can then enjoy the benefits that accrue with possessing a valued quality within their communities and thereby savor the respect they receive.

The debates about the essence of human nature will probably continue as long as man survives, and I cannot imagine that opposing viewpoints will ever be resolved. Only each concerned individual can decide who he/she is, and only a few will take the trouble to do so. Although we are clearly a biological species, we seem to be different from all other organisms we have "met" so far.

Our ability to dominate various ecosystems and shape them to our almost exclusive use seems all-dependent on our being human—having a brain that functions on a scale not yet achieved by any other creature. Mankind has virtually by-passed the slow process of evolution that all other organisms must follow—one based on transmitting altered genetic information to make them more adaptable through mutations. Humans have speeded up the process of change through cultural evolution, that is, by transmitting useful practices or information by speech and/or by writing to the next generations. Today the most obvious example of the rapid advance in cultural evolution is the storage, retrieval and transmission of information. Our ability may be approaching the point where mankind can manipulate itself genetically. This path is fraught with still unknown but likely dangerous consequences and, therefore, must be cautiously and responsibly pursued.

There are other costs to the increasing dominance of the "information revolution." For example, most global email is now in English. The spread of one tongue clearly reduces language variety as well as cultural diversity. We are witnessing a monoculturization of the world, which is being fought by people who want to retain diversity in many aspects of life and, of course, by less dominant groups. These less dominant groups have successfully evolved their own living traditions that are generally best adapted to the physical environment in which their cultures have evolved. We are already witnessing this cultural clash in Iraq, Afghanistan and even in "Old Europe."

Modern health practices have enabled the developed world to alter traditional demographic age-spread to produce a population increasingly skewed towards the aged. Normal biological control on population size has, with the exception of AIDS, become increasingly rare as we continue to by-pass natural evolution. Fortunately, many human academics and scientists are concerned enough to study and try to understand humans. It is unlikely we will ever have all the answers, but as an irredeemable optimist, I still put my faith in rational man to lead us to a better future and avoid self-destruction.

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