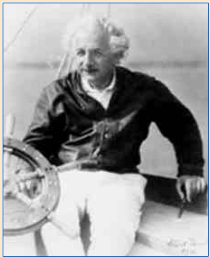


# Taking Einstein's Ethics Into the 21st Century: "Remember Your Humanity"

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As we look back on "The World Year of Physics"\* that celebrated the centennial of Albert Einstein's amazing papers of 1905, and as we reflect on the events of the Twentieth Century that saw him make stands on issues of social justice and human dignity, we can also look ahead into the Twenty-First Century, and apply Einstein's principles to the challenges that lie before us. If Einstein were here today, what would he say? How would he advise us? What would he do?

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In December 1999, *Time* magazine named Albert Einstein its "Person of the Twentieth Century." The editors identified three great themes of those ten decades: The grand struggle between totalitarianism and democracy; courageous individuals resisting authority to secure human rights; and the explosion of scientific knowledge. Einstein was at the forefront in the development of all three. The *Time* editors wrote, "He combined rare genius with a deep moral sense and a total indifference to convention." [1]

It's easy to turn Einstein into a lofty image on the frescoed ceiling of the Church of Reason. [2] Einstein would not like that. He was a genius, but he was also a guy who had his personal weaknesses and cares. He liked to play the violin and sail his sailboat *Tinnef* (Yiddish for "cheaply made"). He possessed a keen sense of humor. His friend and biographer Abraham Pais tells how Einstein enjoyed a good joke. So Pais saved jokes to tell him. "As I told these stories, his face would change. Suddenly he would look much younger, almost like a naughty schoolboy. When the punch line came, he would let go with contented laughter, a memory I particularly relish." [3] Let us remember Einstein's *humanity*.

In December 1938, in Berlin, nuclear fission was discovered. Many people quickly realized that a chain reaction and nuclear bombs might be possible. In August 1939, Leo Szilard and Eugene Wigner visited Einstein at his summer cottage on Long Island. They asked him to sign a letter informing President Roosevelt of these developments.

Here was an ethical dilemma for Einstein. A pacifist from his youth, he was now being asked to advocate nuclear weapons research on the eve of war. In 1922 he had written that he favored Gandhi's method of peaceful resistance to evil. But after Hitler came to power Einstein's pacifism changed. Reflecting on it in 1953, he remarked:

*I am a dedicated but not an absolute pacifist; this means that I am opposed to the use of force under any circumstances except when confronted by an enemy who pursues the destruction of life as an end in itself.* [4]

This stipulation must have weighed on his mind as he pondered the letter to Roosevelt. Germany had stopped the sale of uranium from the Czechoslovakian mines. In Berlin some of the American work on uranium was being repeated. Einstein signed the letter and sent it to Roosevelt. He came to regret it, saying after the war:

*Had I known...the Germans would not succeed in producing an atomic bomb, I never would have lifted a finger.* [5]

Nature makes fission chain reactions possible. That's how the world *is*. What we *ought* to do about it presents a different kind of question, namely, what ethical principles guide our decisions about

use? Progress in science, and especially its applications in technology, proceeds faster than progress in ethics.

Besides weapons of mass destruction, other ethical dilemmas loom large over the twenty-first century. Among these are environmental sustainability and engineering our DNA. Let's consider genetic manipulation, which will come of age in this century.

In the opening ceremonies of the 2004 Olympic Games in Athens, at the end of a beautiful pageant celebrating the past glories of civilization, the lights went down. Into a soft blue light stepped a young pregnant mother. She walked slowly and gracefully in a widening spiral. Suddenly, from beneath her delicate gown, the "baby" within her, the future of humanity, began to glow with soft luminosity. The double helix pattern of DNA suddenly appeared in lights hovering over mother and child. This apparition seemed to raise the question: Now that we know DNA, will we use our knowledge wisely?

Images are powerful, and I found this one moving. It evoked a flood of thoughts and emotions about our common humanity that links all people across history. The dancing DNA seemed to ask *us*: Will our shared human nature continue for as many generations to come?

Unlike nuclear weapons that are clearly dangerous, genetic technology presents its benefits and dangers in one seamless package. As one who watched Alzheimer's disease take his mother's identity and life, one side of me says—let's go for it. But as one who also wants "human nature" to have a stable meaning, I remember that it's easier to *do* something than to *undo* it. Altering our genes—especially through germline genetic engineering—could lead us into a posthuman future. [6] *Ought* we to go there, even if we *can*?

According to Einstein, answers to the "ought" questions come from outside scientific research itself:

*...One can have the clearest and most complete knowledge of what is, and yet not be able to deduct from that what should be the goal of our human aspirations...the ultimate goal itself and the longing to reach it must come from another source...* [7]

Goals require principles. Let's follow Einstein's applications of *his* principles.

In 1914 Einstein moved from Switzerland to Berlin to assume the directorship of the new Kaiser Wilhelm Institut für Physik and a research position under the aegis of the Prussian Academy of Sciences. By the end of 1915 he completed the General Theory of Relativity, and with it explained the anomalous precession of Mercury's perihelion, and predicted the magnitude of starlight deflection by the Sun.

World War I formally ended with the Armistice of November 11, 1918. The war had prevented testing the starlight deflection prediction, but a solar eclipse would occur on May 29, 1919. The challenge to test Einstein's prediction was taken up not by the Germans, but,

thanks to Arthur Eddington, by the British, who sent two expeditions. On November 6, the Royal Society and the Royal Astronomical Society held a joint meeting where, beneath a portrait of Newton, it was announced that the expedition's photographic plates confirmed Einstein. Meeting president J. J. Thompson called the achievement "...not the discovery of an outlying island but a of a whole continent of new scientific ideas." [8] This made the news. On November 7 the *London Times* carried these headlines: [9]

**REVOLUTION IN SCIENCE  
NEW THEORY OF THE UNIVERSE  
NEWTONIAN IDEAS OVERTHROWN**

Two days later The New York Times was even more breathless: [10]

**LIGHTS ALL ASKEW IN THE HEAVENS  
MEN OF SCIENCE MORE OR LESS AGOG OVER RESULTS OF ECLIPSE  
OBSERVATIONS  
EINSTEIN THEORY TRIUMPHS**

Thus did Einstein become in 1919 an enduring international celebrity. Why did he so capture the public's imagination? Partly it was the timing. A year earlier Germany and Britain had been fighting to the death. Now a solitary genius from Germany had raised our imagination to the stars, and the scientific sages of Britain had pronounced him right. The weary human race could lift its eyes from mud and mustard gas and slaughter and see itself engaged in something higher, its imagination pulled along by Einstein's.

The rest of it—perhaps most of it—was Einstein's character. Self-effacing, articulate, and unpretentious, Einstein used his fame to speak out for justice and human dignity. He was a free thinker who spoke his mind, thoughtfully but forcefully, on matters of war and peace, nuclear weapons, arms control, religion, personalities, civil rights, life and death, moral trends, economics, education, international relations. Whether his views were popular or not was never his concern. An abstract of Einstein's ethical principles would be: *Remember your humanity.*

For an establishment figure in Germany, Einstein held rather non-establishment views. In 1915 he signed his first political manifesto, calling for European scientists and artists to maintain contact during the war. About that time he also joined his first pacifist society. Many times over the years Einstein advocated civil disobedience against military conscription. Reaction to Einstein by German chauvinists was hostile, and grew sometimes dangerous to the point of requiring bodyguards. In 1931, having seen much mindless mass militarism and about to see more, but believing in the dignity of the individual, Einstein wrote:

*...The really valuable thing in the pageant of human life seems to me not the State but the creative, sentient individual, the personality; it alone creates the noble and the sublime, while the herd as such remains dull in thought and dull in feeling.* [11]

A sample of Einstein's activist engagements in, say, 1931, include speaking at Caltech on the social role of science; addressing a peace group in Chicago; and speaking at a mass meeting to support E.J. Grumbel, a professor at Heidelberg who courageously exposed political assassinations by Nazis and was attacked by right-wing students. [12] Also in 1931 Einstein supported the International Union of Anti-Militarist Clergymen and Ministers; met with War Resisters International; and joined an international protest to save the lives of eight Alabama blacks wrongly convicted of rape. In 1933 Einstein

helped organize a mass meeting in London for the Refugee Assistance Fund to aid victims of the Nazis. In 1935 he helped initiate a campaign to award the Nobel Peace Prize to the pacifist Carl von Ossietzky, who was ill in a German concentration camp. [13]

In December 1932 Albert and Elsa Einstein left Germany for another trip abroad, this time, as it turned out, never to see Germany again. For in January 1933 Adolf Hitler came to power. Einstein cut his ties with Germany, including the Prussian Academy, from which he resigned on March 28, saying: [14]

*...I will only stay in a country where political liberty, toleration, and equality of all citizens before the law are the rule.... These conditions do not obtain in Germany at the present time.*

Einstein had stood up for his German colleagues more than once. For instance, he refused to attend the 1924 Solvay Conference because other German scientists were not invited. [15] He had written in 1920 that, "Berlin is the place to which I am most closely tied by human and scientific connections." [16] Despite these connections, on April 7, 1933, the Prussian Academy sent this message to Einstein:

*...We had confidently expected that one who had belonged to our Academy for so long would have ranged himself, irrespective of his own political sympathies, on the side of the defenders of our nation... a good word for the German people from you...might have produced a great effect, especially abroad...*

Anyone who says Einstein is hard to understand never read his reply of April 12:

*I have received your communication of the seventh...and deeply deplore the mental attitude displayed in it...*

*You...remarked that a "good word" on my part for "the German people" would have produced a great effect abroad. To this I must reply that such a testimony...would have been equivalent to a repudiation of all those notions of justice and liberty for which I have all my life stood... By giving such a testimony in the present circumstances I should have been contributing...to the barbarization of manners and the destruction of all existing cultural values.*

*It was for this reason that I felt compelled to resign from the Academy, and your letter only shows me how right I was to do so.*

After World War II Einstein immersed himself in activism as never before, on behalf of the world's future. An *Atlantic Monthly* article of November 1945 went straight to the heart of the matter:

*The release of atomic energy has not created a new problem. It has merely made more urgent the necessity of solving an existing one.* [17]

In a speech the next month Einstein described an unstable postwar world:

*...The war has been won, but the peace is not... Territorial questions and arguments of power, obsolete though they are, still prevail over the essential demands of common welfare and justice....* [18]

Although he supported the peaceful uses of atomic energy, for nuclear weapons control Einstein considered necessary a world government founded on international law and shared security. On such positions Einstein was thought by some to be naive. Abraham Pais observed that political problems have no answers, only compromises. Pais

wrote, “Nothing was more alien to Einstein than to settle any issue by compromise, in his life or in his science. He often spoke out on political problems, always steering to their answer. Einstein was not only not naive but highly aware of the nature of man’s sorrows and his follies....[19] “Some of his suggestions were perhaps unrealistic, others perhaps premature. Certain it is, though, that they originated from a clear mind and strong moral convictions.”[20]

Einstein ridiculed all forms of strutting authority. During the McCarthy era, high school English teacher William Frauenglass was summoned to appear before the Senate Internal Security Subcommittee because of some lectures he had given six years earlier. He refused, was threatened with dismissal, and wrote to Einstein. Einstein’s reply, published in the *New York Times* in June 1953, urged a public defiance unusual for that time:

*It is shameful for a blameless citizen to submit to such an inquisition...this kind of inquisition violates the spirit of the Constitution...Frankly, I can see only the revolutionary way of non-cooperation in the sense of Gandhi’s.*[21]

In 1954 Einstein joined in publicly condemning the government’s security hearings against Robert Oppenheimer. Privately Einstein said that Oppenheimer should merely go to Washington, tell the government officials they were fools, and go home.[22]

As an ethnic Jew, Einstein experienced anti-Semitism personally, and quietly helped many Jews find refuge in America. He passionately supported the Zionist cause. However, in his advocacy for Zionism Einstein always insisted on Jewish-Arab amity in Palestine, saying in a 1938 speech:

*I should much rather see reasonable agreement with the Arabs on the basis of living together in peace than the creation of a Jewish state.*[23]

In 1946, after he had lived in the USA for 13 years, Einstein could remain silent no longer on American racial discrimination. He published in *Paegent* magazine the article described below. It illustrates how he brought to the analysis of ethical problems the same clarity of thought that he brought to relativity and the quantum. Sometimes there is value in thinking like a physicist, even when the problem lies outside the scope of physics.

So let me digress to recall Einstein’s celebrated papers of 1905.[24] One paper demonstrated how the concept of quantized light must be taken seriously. Another paper, that grew from his dissertation of the same year, showed how Brownian motion could tell us whether molecules were real, and yield a measure of their size. A fourth paper introduced special relativity. The fifth showed the equivalence of mass and energy. In these papers we can identify six practices in Einstein’s approach to doing physics:

1. Einstein questioned assumptions that others took for granted. For example, the paper on light quanta began by asking why matter was conceptualized as *discrete* particles but the electromagnetic field as *continuous* functions.
2. Einstein worked always from first principles. He motivated light quanta by going back to the second law of thermodynamics, comparing the entropy of radiation to that of a gas of particles.
3. Einstein pursued ideas relentlessly to their conclusions.  $E = mc^2$  was a logical consequence of the relativity paper.

4. Einstein worked not from ideology but from his understanding of reality. He did not create special relativity by defending some philosophical position on whether space and time are absolute or relative; rather, he asked how one *actually measures* the length of a moving object and the time interval between events.

5. Einstein demanded that all claims be tested in reality. In the mass-energy equivalence paper he suggested how the theory could be tested with radium.

6. Above all, Einstein possessed an inner freedom. This personal quality made everything else possible.

Einstein applied these same principles to ethics. For example, these practices for doing physics are applied in Einstein’s 1946 *Paegent* article on American racial discrimination, to which we now return.[25] Einstein began by recalling an assumption enshrined in American ideals:

*...In the United States everyone feels assured of his worth as an individual. No one humbles himself before another person or class...*

Next the physicist who in 1905 wrote of electrodynamics that “there seem to be asymmetries not inherent in the phenomena” noted an inconsistency between American ideals and practice:

*There is, however, a somber point in the social outlook of Americans. Their sense of equality and human dignity is mainly limited to men of white skins...The more I feel an American, the more this situation pains me. I can escape the feeling of complicity only by speaking out.*

Einstein recalls the unexamined assumption of intrinsic racial inequity that was held by many Americans at the time. He proceeds to smash this assumption with the realities of history:

*I am firmly convinced that whoever believes this suffers from a fatal misconception. Your ancestors dragged these black people from their homes by force; and in the white man’s quest for wealth and an easy life they have been ruthlessly suppressed and exploited, degraded into slavery. The modern prejudice against Negroes is the result of the desire to maintain this unworthy condition.*

Einstein next reminds us how even the most intelligent members of a society can buy into its contradictions:

*The ancient Greeks also had slaves. They were not Negroes but white men who had been taken captive in war. There could be no talk of racial differences. And yet Aristotle...declared slaves inferior beings who were justly subdued and deprived of their liberty. It is clear that he was enmeshed in a traditional prejudice from which, despite his extraordinary intellect, he could not free himself.*

Now Einstein goes back to first principles—our upbringing from childhood—and pursues the consequences:

*A large part of our attitude towards things is conditioned by opinions and emotions which we unconsciously absorb as children....It would be foolish to despise traditions. But...We must try to recognize what in our accepted traditions is damaging to our fate and dignity—and shape our lives accordingly.*

*I believe that whoever tries to think things through honestly will*

soon recognize how unworthy and even fatal is the traditional bias against Negroes.

Finally Einstein suggests how to implement these principles in reality:

*What...can the man of good will do to combat this deeply rooted prejudice? He must have the courage to set an example by word and deed, and must watch lest his children become influenced by this racial bias...*

It is instructive to remember that Einstein wrote these lines eight years before *Brown vs. Board of Education*, and nine years before the world knew the quiet courage of Rosa Parks.

In the twenty-first century, new ethical dilemmas will soon be upon us, to join the familiar ones. The familiar ethical dilemmas include ignorance, poverty, genocide, weapons of mass destruction, an exploding population, energy sources, environmental degradation, extinction of species and languages. The newer ones may include enhancing our evolution by rearranging our genes or implanting microchips in our cerebral cortex. If we go *there*, we had better know what we are enhancing ourselves *to*. [26] Is there a goal?

In basic research we put questions to Nature to learn how the world *is*. That is the *goal* of research. But in technology's applications, where we turn Nature's answers back onto ourselves, then, as Einstein observed, we must *select* thoughtful goals. Here it helps to have someone who thinks like a physicist.

Physics in the twenty-first century promises great adventures. The gravitational waves that Einstein predicted in 1916 will probably be detected (or it will become of capital importance if they are not). We may come to understand dark energy, our "ether" in 2005. We may peer into the Planck scale where superstrings lurk. Life on extrasolar planets may be found. Perhaps a student sitting in a classroom today will be the first person to *really understand* the foundations of quantum mechanics, by creating a deeper system of concepts in terms of which the Planck-Einstein relation  $E = h\nu$  will emerge as a consequence. Physics will help decipher the complexities of tropical forests and nervous systems. If Einstein were here, he would be in the middle of it all, having a great time. But he would also speak up for justice and human dignity. He never forgot that we physicists are members of the human family.

In April 1955, one week before he passed away, Einstein signed his last public manifesto. Its closing lines are a fitting summary of Einstein's ethic. May we make it our own, and take it with us through the twenty-first century: [27]

*There lies before us, if we choose, continued progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity and forget the rest.*

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\* This article is the text of a speech first presented at the Sigma Pi Sigma Congress, October 15, 2004, University of New Mexico, Albuquerque, NM. That Congress kicked off the World Year of Physics.

[1] *Time*, Dec. 31, 1999. The three themes are mentioned on p. 50.

[2] "The Church of Reason" metaphor was introduced by Robert Pirsig in Chapter 13 of *Zen and the Art of Motorcycle Maintenance*, Morrow and Co. (1974).

[3] Abraham Pais, *Subtle is the Lord...: The Science and the Life of Albert Einstein*, Oxford University Press, p. 453.

[4] Letter to a Japanese correspondent, *The Quotable Einstein*, Alice Caprice, Ed., Princeton Univ. Press (1996), p. 117.

[5] *ibid.*, 130.

[6] Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution*, Picador (2002).

[7] Albert Einstein, *Out of My Later Years*, Citadel Press (1974), p. 22. From an address "Science and Religion," delivered at Princeton Theological Seminary, May 19, 1939. Also published in *Ideas and Opinions*, Crown Publishers (1982), p. 42.

[8] Quoted in Richard Rhodes, *The Making of the Atomic Bomb*, Touchstone (1986), p. 169.

[9] Pais, ref. 3, p. 307.

[10] *ibid.*, p. 309.

[11] Albert Einstein, *The World As I See It*, Citadel Press (undated), p. 4.

[12] A. Einstein, "The Liberty of Doctrine—à propos of the Gumbel Case," *ibid.*, p. 5.

[13] A timeline of some of Einstein's social activism can be found at the website of the History Center of the American Institute of Physics, <http://www.aip.org/history/einstein/public3.htm>

[14] The complete correspondence between Einstein and the Prussian and Bavarian Academies over his resignation, may be found in *The World As I See It*, pp. 81-89; also in *Ideas and Opinions*, pp. 205-211.

[15] Ronald Clark, *Einstein, The Life and Times*, Avon Books (1971), pp. 279-280.

[16] Pais, ref. 3, p. 316.

[17] A. Einstein, "Atomic War or Peace," *Out of My Later Years*, Citadel Press (1974), p. 185. Original source: *Atlantic Monthly*, Nov. 1945.

[18] A. Einstein, "The War Has Been Won, but the Peace is Not," *Out of My Later Years*, Citadel Press (1974), p. 200. The original speech was an address at the Fifth Nobel Anniversary Dinner at the Hotel Astor, New York, December 10, 1945.

[19] Pais, ref. 3, p. 11.

[20] *ibid.*, p. 475.

[21] *New York Times*, June 12, 1953; and Pais, ref. 3, p. 474.

[22] Pais, ref. 3, p. 11.

[23] A. Einstein, "Our Debt to Zionism," *Out of My Later Years*, Citadel Press (1974), p. 263. A speech delivered at the "Third Seder" celebration of the National Labor Committee for Palestine, Commodore Hotel, New York, April 17, 1938; published in *New Palestine*, Washington, DC, April 29, 1938. Also reprinted in *Ideas and Opinions*, pp. 188-190.

[24] Translations of the 1905 papers can be found in John Stachel, Ed., *Einstein's Miraculous Year: Five Papers that Changed the Face of Physics*, Princeton University Press (1998).

[25] A. Einstein, "The Negro Question," *Out of My Later Years*, Citadel Press (1974), pp. 132-134; originally published in *Pageant*, New York, January 1946.

[24] Bill McKibben, *Enough: Staying Human in an Engineered Age*, Owl Books (2003).

[26] Signed with Bertrand Russell, this was part of Einstein's last statement. Issued July 9, 1955. From *The Quotable Einstein*, Alice Caprice, Ed., Princeton Univ. Press (1996), p. 130.

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