Robert A. Millikan, physics Nobel laureate and Darwin doubter

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Nobel laureate Robert Millikan was one of the most eminent physicists of the 20th century. He was also openly a Christian and, although a physicist, expressed in his writings major reservations about not only orthodox Darwinism but also the whole problem of dogmatism in science. His thinking on the shortcomings and limitations of science are especially insightful.

Robert Andrews Millikan (1868–1953) was the 1923 Nobel laureate in physics, and one of the foremost American physicists of the last century.[1,2] His "record as a researcher and teacher was second to none."[3] He was awarded a total of 25 honorary doctorates and many prestigious medals ranging from the Hughes Medal to the Faraday Medal.[4]

Reared in a large loving family, and the son of a Congregational minister, Millikan grew up to become the president of California Institute of Technology in Pasadena, California (Caltech). His role in establishing Caltech as a leading scientific research school was so important that it was called "Millikan's School" for years.[5] His scientific achievements are such that he has "long been considered the 'dean' of American scientists."[6]

Robert Millikan graduated from Oberlin College in Ohio and earned a Ph.D. in physics from Columbia University in 1895. He also studied in Germany under Max Planck. Millikan was a professor at the University of Chicago from 1896 until 1921, when he moved to Caltech where he remained until he retired. He also published widely, including several leading science textbooks.[7] The first American-born physicist to become a Nobel laureate, Millikan also became a leader in the application of scientific research to industry, especially military industries.[8]

Most famous for his oil drop experiments, in which he determined the electrical charge of the electron, he was also involved in many of the major developments in radio and in various practical areas of electronic technology. His research on the electron was a critical factor in opening up the door to the electronics revolution.

His Ph.D. students also played an important role in this revolution. For example, his former student Dr H.D. Arnold developed an electronic repeater that, for the first time in history, made effective coast-to-coast telephone communication possible.[9] Not long after this, long distance telephone communication became universal in the industrialized world.

Millikan's decades of work on "cosmic rays" (a term he coined in 1925) was a critical development in the study of modern astronomy.[3] As an active Christian Millikan even found religious significance in his studies of cosmic rays, as he did in his other research, concluding that the "Creator is still on the job".[10]

The oil drop experiments

His most well known scientific research involved oil drop experiments to accurately determine the electrical charge on an electron; this research took five years to complete. A major question at the time was, "is the electron a discrete particle with a single charge or a particle with a range of sizes and charges?" Millikan's research was the first major step toward proving that, as far as we can measure, all electrons are *identical* in both charge and mass, thus documenting the inference that an incredible degree of manufacturing quality control existed to produce these critical fundamental building blocks of the universe with a level of perfection so high that no known variation exists.

This fact is not only evidence for intelligent design, but it is also evidence for a level of quality control unheard of even with modern industrial technology; a level that humans are unable to achieve with either current or any foreseeable technology. Millikan's research also proved the particulate nature of electrons, and thus electricity. It was for this work that he was awarded the Nobel Prize for physics in 1923. His research caused him to conclude that the design of everything, from the atom to the universe, was the work of God, who Millikan called the "beneficent creator" and the "Great Architect" in recognition of His creative powers and His role in creation.[11,12]

Millikan, religion and science

Millikan was an active Christian for his entire life. Although a physicist and not a biologist, he was very aware of the conflicts between orthodox Darwinism and theism. He often acknowledged that scientists are far too dogmatic about Darwinism, cautioning "we have only just begun to touch the borders of the ocean of knowledge and understanding."[13] This has proven to be good advice in view of what biology has discovered about the cell and life since the 1950s.[14] One topic he mentioned repeatedly in his publications was that one of the greater blunders that "science" has made was over generalizing claims "with undue assurance into fields in which they have not been experimentally tested" and

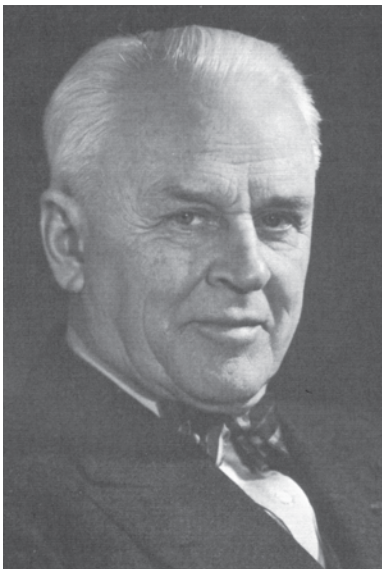
> "… treating these generalizations as fixed, *universally* applicable principles instead of as essentially working hypotheses. This has led in the past to a dogmatism in science which is at bottom indistinguishable from dogmatism in theology or in

any other field; for dogmatism in any field is merely assertiveness without knowledge. But the physicist has recently, through his blunders and his new experimental findings, learned a lesson of open-mindedness which cannot fail to influence other fields of thought. Philosophy and theology, as well as biology and psychology, are sure to profit from it."[15]

Millikan stressed in his writing and lecturing that scientists must be humble about what is known and stop assuming that science knows more than it actually does. He was especially critical of dogmatism in science, stressing that a major blunder of scientists was "generalizing farther than the observed facts warranted" due to the incorrect

> "… *assumption that our feeble, finite minds understand completely the basis of the physical universe.* This sort of blunder has been made over and over and over again throughout all periods of the world's history and in all domains of thought. It is the essence of dogmatism—assertiveness without knowledge. This is supposed to be the especial prerogative of religion, and there have been many religious dogmatists, but not a few of them, alas among scientists. Everyone will recognize Mr. Bryan, for example, as a pure dogmatist, but not every scientist will realize that [Darwinist] Ernst Haeckel was an even purer one [emphasis in original]."[16]

Millikan concluded that it is critically important for scientists to maintain "an attitude of humility and of reverence in the face of nature, to keep … [being] receptive of truth and conscious of the limitations of our finite understanding" of the natural world.[17]



Robert Andrews Millikan, scientist, professor, and college administrator. This picture was taken around 1917 at the height of his career. When he became president of Cal Tech he was forced to move more into an administrative role, a role he only reluctantly assumed because his first love was the lab.

His creation views

In an address to the American Chemical Society, Millikan said "everyone who reflects believes in God" and that it is pathetic "that many scientists are trying to prove the doctrine of evolution, which no scientist can do."[18] He concluded that the discoveries of science have forced scientists to realize that modern science "is slowly learning to walk humbly with its God, and in learning that lesson it is contributing something to religion."[19]

Millikan also believed that God not only originally created matter and life, but that "the creator is still on the job" of creating today.[20] What most impressed Millikan was the wonder of the human mind: "The most amazing thing in all life, the greatest miracle there is, is the fact that a mind has got here at all, 'created out of the dust of the earth.' This is the Bible phrase, and science today can find no better way to describe it—a mind" that thinks.[21]

Millikan often stressed that humans are not animals, noting that one cannot even "imagine a mere animal thinking about a future life" as do humans.[22] The chasm between humans and animals is so enormous that the "great *spiritual* forces which are in varying degrees in all mankind … sharply differentiate man from the whole lower animal kingdom."[23] He added that even Charles Darwin in

> "… an attitude of reverence … wrote, 'No man can stand in the tropic forests without feeling that they are temples filled with the various productions of the God of nature, and that there is more in man than the breath of his body.'"[15]

Millikan called "this amazing plan of creation" a work designed by God, "the Great Architect". Asking if life and the creation are just "blind, unintelligent chance?", Millikan answered "the fool hath said in his heart, there is no God" and "instead of calling what had happened *accident* [he] thanked God" for creating His creation.[24]

Millikan concluded "the Great Architect" not only has created the world in the past, but that we are "inside, not outside, Creation's plan."[25] Furthermore, the essence of the teachings of Jesus created the Christian church that is "unquestionably the greatest social institution in the country."[26] Millikan added that "the combination of science and religion … provides today the sole basis for rational intelligent living" and that religion and science "are the two great sister forces which have pulled, and are still pulling, mankind onward and upward."[27]

Millikan also recognized that when science discovered the laws of physics, it also confirmed the teaching of Christianity and refuted the teaching of the pagans. The laws of physics allowed humankind to "know a God not of caprice and whim, such as were all the gods of the ancient world, but a god who works through law" who revealed "a nature of orderliness, and a nature capable of being known; a nature, too, whose functioning might be predicted, a nature which could be relied upon; a nature, also, of possibly unlimited forces, capable of being discovered, and then of being harnessed for the benefit of mankind."[28] At times he used the word "evolution", not with reference to Darwinism, but rather to progress in scientific research and knowledge by intelligent agents (mankind), a point that needs to be stressed when reading his writings.[29]

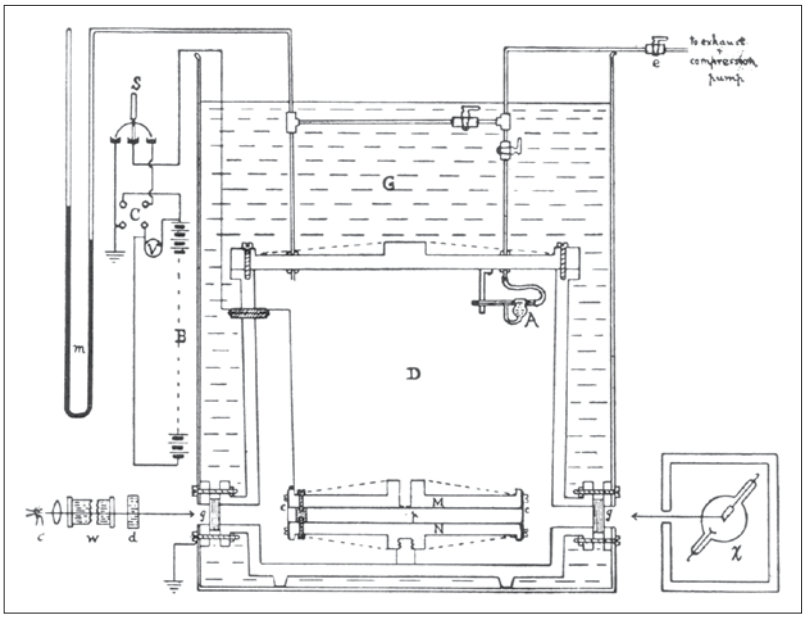
He was a conservative and staunch Republican, and also a mainline Presbyterian.[30] Nonetheless, Millikan stressed that the "net result of Scopes trial and of all the newspaper discussion that has gone with it" has, as a whole, been very beneficial because it because it brought religious-science questions out in the open.

His strong opposition to naturalism

Millikan was especially critical of *naturalism* (the worldview that teaches only the material world exists). He wrote that the eighteenth-century French philosophers

> "… forgetting that the essence of the scientific method lay in sticking close to the observed facts and not asserting knowledge beyond the range of observation, yielded to the lure of such inclusive generalizations as had rendered Greek philosophy impotent and proceeded to convert Galileo's and Newton's science into a mechanical philosophy in which the whole of the past and future was calculable from the positions and motions of inert material bodies and man became a machine."[31]

He concluded that although materialism was sometimes called scientific, it was "in its very method and essence unscientific" because it was "universally assertive and dogmatic", and that "clear-thinking minds in all countries refused to be stampeded by it, realizing the limitations of the scientific method."[31]



A schematic diagram of the apparatus used for Millikan's famous oil drop experiment. Millikan and his student, Harvey Fletcher, used the oil-drop experiment in 1909 to measure the electrical charge of an electron, an important fundamental constant required to understand both physics and chemistry.

Millikan realized that the newer discoveries of science documented that, for science to progress, scientists must stick "close to the scientific method and avoid extending generalizations into fields beyond those in which experimental observations have demonstrated their validity."[32] Science must be guided only "by brute facts" regardless of whether they fit into our worldview. Millikan explained how 18th and 19th century materialism assumed that our universe consisted

> "… of a fixed number of unchangeable atoms, and then brute facts were found which showed that some of these atoms were changing continuously into other atoms and the dogma of the immutable elements was gone. Then materialism assumed that the universe could be accounted for in terms at least of the motions of *'material'* particles of some kind, and then brute facts were found which showed that matter could disappear into radiant energy or ether waves, and the dogma of the conservation of matter was gone, and with it the excuse for the very name materialism."[33]

Another example is that materialism had assured us that the entire universe could be explained by

> "… Galilean and Newtonian mechanical laws, which in large-scale phenomena had always been found to work. Then brute facts were found having to do with specific heats at low temperatures for example, where the laws of Galilean and Newtonian mechanics simply did not work at all and the dogma of the universality of the mechanical laws was gone."[34]

He continues, "materialism assumed the universality of the electro-dynamic laws" and soon a

> "… region was found having to do with spectroscopic and X-ray phenomena in which these did not work and another dogma blew up. Then materialistic philosophy asserted that light must be ether waves or corpuscles. It was inconsistent or unintelligible that it could be both, and again brute facts appeared which showed that, whether it was intelligible or not, light acts at one and the same times like both waves and corpuscles, and now every physicist is accepting these apparently contradictory facts ... Then materialism assumed that because the laws of interaction of bodies at slow speeds had been verified they would also hold for high speeds, and brute facts appeared which denied the validity of this generalization and in the denial gave birth to the theory of relativity."[35]

He concluded that the result of these discoveries is that "dogmatic materialism in physics is dead" and if "we had all been as wise as Galileo and Newton it would never have been born, for dogmatism in any form violates the essence of the scientific method, which is to collect with an open mind the brute facts and let them speak for themselves untrammeled by preconceived ideas or by general philosophies or universal systems."[36]

Millikan on atheism

Millikan was especially hard on those evolutionists who embraced naturalism, concluding such a view was "irrational and unscientific" because it asserts that "there is nothing behind or inherent in all the phenomena of nature except blind force, and that in the face of the fact that he [the atheist] sees evidence of what he is wont himself to call intelligence in the workings of his own mind, and in the myriads of other minds which are a part of nature."[37]

Atheism, Millikan emphasized, was so anti-science that he knew of nothing that could possibly "be more antagonistic to the whole spirit of science" adding that even "Voltaire condemned it as unintelligent when he wrote: 'If God did not exist it would be necessary to invent him.'" Millikan then stated that if he

> "… were confronted with a choice between these two types of dogmatic religion, fundamentalism, and atheism … I should choose fundamentalism as the less irrational of the two and the more desirable, for atheism is essentially the philosophy of pessimism, denying, as it does, that there is any purpose or trend in nature, or any reason for our trying to fit into and advance a scheme of development."[38]

Summary

Millikan was a leading intellectual and among the most famous American scientists of the last century.[39] He strongly expressed in his writing very clear objections to evolutionary naturalism.[40]

His words and works, though over a half-century old, still provide much insight into the problems of evolutionary naturalism, the dominant view among eminent scientists today. Millikan was a well-known scientist and therefore he was "widely quoted on questions of science and religion."[41] His faith was widely acknowledged and was so respected by other scientists that he was known in his day as the "pious physicist of the California Institute of Technology."[42,43] Millikan's conclusion was "scientific progress is not the most important" but rather the "most important thing in the world is a belief in the reality of moral and spiritual values."[44]

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