

GENERAL SCIENCE

A Better World or No World

Dr. Millikan in his autobiography describes the way to a better world. Man must utilize his intelligence in the promotion and application of the good way.

By ROBERT A. MILLIKAN

Dr. Millikan, dean of American physicists, in concluding his autobiography just published, discusses the two supreme elements in human progress. These excerpts from THE AUTOBIOGRAPHY OF ROBERT A. MILLIKAN (Copyright 1950 by Prentice-Hall, Inc.) defines the scientific approach to religion of this Nobelist who continues his researches at the age of 82.

► NEVER in history has mankind faced a situation which forced every person on earth to ask himself so insistently the question, "How can I help to make a better world?" for we know, as never before, that unless by our joint efforts we do find a way specifically to put an end to world wars and their mass killings the human race has the possibility, and indeed the likelihood, of destroying itself; so that the choice is now between a better world or no world.

That conviction had come to most intelligent and informed men before the advent of the atomic bomb.

I heard one of our foremost industrialists—a man who is in no sense a sentimentalist, rather a "hard-boiled" realist—in commenting in 1944 upon the immense cost of the war and the terrific destruction wrought by our bombing raids over German cities, speak as follows:

"No nation on earth is rich or powerful enough to keep this up and survive even though victorious, to say nothing of the utter ruin that is coming to Germany with practically all her cities being reduced to rubble heaps."

The key, then, to my own answer to the question I have raised is found in the following statement: Human well-being and all human progress rest at bottom upon two pillars, the collapse of either one of which will bring down the whole structure.

Pillars of Progress

These two pillars are the cultivation and the dissemination throughout mankind of (1) the *spirit* of religion, (2) the *spirit* of science (or knowledge).

In the long sweep of evolutionary history from amoeba up to man in 1950, what we call spirit or soul—the latest and the most important element in the evolutionary process of creation—first began to appear in and evolve from the animal world when a being developed who began to bury with the bodies of his dead the implements that he thought might be needed in a world beyond the grave.

That was a supreme moment. For can one imagine a mere animal thinking about a future life?

Dawn of Divine Thinking

Breasted calls the time at which this kind of an idea first came into a brain "the dawn of conscience." I shall call it also the dawn of religion, for with all the evolution that religion has undergone since its very crude beginnings at that far distant date, our word conscience, which implies a sense of personal responsibility—a consciousness that "I ought or I ought not," is today very closely identified with what I mean by the spirit of religion.

But in this long evolution of religion since that time, the word religion has, in fact, had all kinds of extraneous ideas associated with it or grafted upon it, some good, some very bad.

It has meant, and still means in some minds, crude superstition; it has meant all kinds of man-made theologies; it has meant bigotry and intolerance and wars and inquisitions.

But none of these things has, or should have, anything to do with what I call the essence of religion in the United States today.

I want, therefore, to get rid of all these excrescences and to get down to the essential thing, and we can do it, I think, as follows:

We have in this country dozens of different religious sects and just as many different theologies, all necessarily wrong in some particulars since there obviously can be but one correct theology and certainly no one knows what that is; but there is just one element which I find common to all these religions and I know of no other way to find the essence, at least, of the Christian religion than to see what is that common element that all of them consider indispensable.

That common element is found, I think, simply in the life and the teachings of Jesus—in the attitude of altruistic idealism (the psychologist may want to call it extrovertness, the common man simply unselfishness) which was the sum and substance of His message.

Common Element in Religion

He states it in the Golden Rule, "Whatsoever ye would that men should do to you do ye even so to them."

You are the sole judge of what you ought to do. For to man alone of all creation has been given the power of choice between

good and evil, and it is in the exercise of that choice that man fulfills his great mission on earth.

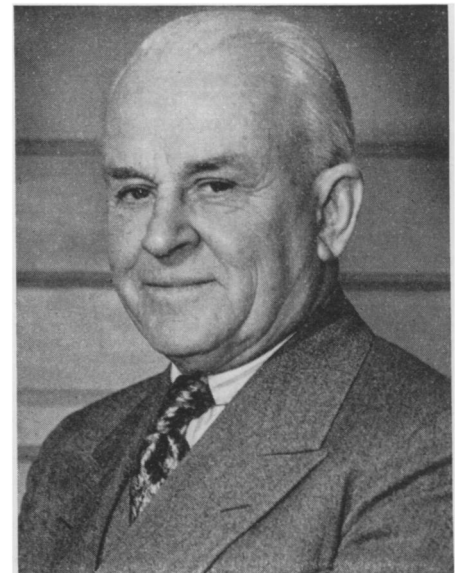
Further, he obviously cannot choose the good without having the possibility of choosing the evil way, and with that choice open, if history teaches us anything then it is to be expected that here and there a John Dillinger or an Adolf Hitler will be found who will choose the evil way.

Is not, then, the following the real answer to the old problem of the abuse of knowledge?

The job of civilized man is not to try to suppress the growth of knowledge, but rather to exercise his intelligence, his own growth in knowledge, to stop the depredations of the Dillingers and the Hitlers by eliminating them if necessary or by other means if he can find such, and at the same time to win as large a fraction of mankind as possible to the free choice of the good way instead of the evil way . . .

Dr. Millikan Defines God

Someone asks, "Where does the idea of God come in? Isn't it a part of religion?" Yes, I think it is, and I should like to reply in three different ways to the question here raised.



NOBEL PHYSICIST—Born the second son of a country minister in Illinois in 1868, Robert Andrews Millikan won the Nobel Prize in Physics in 1923 for his historic measurement of the electron's charge. For many years head of the California Institute of Technology, he has cooperated with national and international organizations in both war and peace.

My first answer is taken directly from Holy Writ and reads: "No man hath seen God at any time . . . If a man says I love God and hateth his brother he is a liar: for he that loveth not his brother whom he hath seen, how can he love God whom he hath not seen?" In other words, one's attitude toward God is revealed by and reflected in his attitude toward his brother men.

My second answer is taken from Dean Shailer Mathews, head of the Baptist Divinity School of the University of Chicago. To the inquiry, "Do you believe in God?" he replied, "That, my friend, is a question which requires an education rather than an answer."

My third form of reply is my own and reads: I do not see how there can be any sense of duty, or any reason for altruistic conduct, which is entirely divorced from the conviction that moral conduct, or what we call goodness, is somehow or other worthwhile, that there is Something in the universe which gives significance and meaning, call it *value* if you will, to existence; and no such sense of value can possibly inhere in mere lumps of dead matter interacting according to purely mechanical laws.

Thousands of years ago Job saw the futility of finite man's attempting to define God when he cried, "Can man with searching find out God?" Similarly, wise men ever since have always looked in amazement at the wonderful orderliness of nature and then recognized their own ignorance and finiteness and have been content to stand in silence and in reverence before the Being who is *immanent in Nature*, repeating with the psalmist, "The fool hath said in his heart, there is no God." Einstein, one of the wisest of modern men, has written:

"It is enough for me to contemplate the mystery of conscious life perpetuating itself through all eternity, to reflect upon the marvelous structure of the Universe which we can dimly perceive, and to try humbly to comprehend even an infinitesimal part of the *intelligence* manifested in nature."

I myself need no better definition of God than that, and some such idea is in all religion as a basis for the idea of duty.

Science News Letter, May 13, 1950

MEDICINE

More Effective Cancer Treatment with Hormones

➤ SEX hormones may make radioactive phosphorus 15 to 20 times more effective in treating cancer. Studies suggesting this were reported by Dr. Saul Hertz of Boston at the meeting in Atlantic City, N. J., of the American Society for Clinical Investigation.

Encouraging results in treating leukemia and a disease in which there are too many red blood cells, polycythemia, with radioactive phosphorus aroused hope of using this for treatment of cancer of other organs, Dr. Hertz pointed out.

Heretofore this hope has unfortunately not materialized because except for certain brain and breast cancers, the cancer did not take up enough more of the radioactive phosphorus than normal tissue. Hope of treating cancers with radioactive chemicals instead of with X-rays or radium had been based on the idea that the cancer would take up more of the radioactive chemical than the normal tissue. In that way more cancer-killing radioactivity could be delivered directly to the cancer.

By giving male and female hormones to cancer patients in advance of the radioactive phosphorus, a concentration of the radioactive chemical in the cancer tissues of 15 to 20 times was obtained compared to a concentration of two to three times by normal control tissues. These studies were made, Dr. Hertz reported, with hopeless cases of advanced cancer that had spread from its original place in the body.

Science News Letter, May 13, 1950

AERONAUTICS

Tiny Planes Without Pilots Are Targets

➤ SPEEDY flying targets for Navy gunnery practice, now ready for testing, are 10-foot tiny airplanes without pilots but powered by ram-jet engines and guided from afar by radio control.

They are the Navy's KDM-1 target drones, and were constructed by the Glenn L. Martin Company. In use, they are taken aloft by a mother plane, suspended near a wing tip. When proper launching speed and altitude are obtained, the engine is started and the target released.

From then on the drone is controlled from afar entirely by radio while its progress is watched on a radar screen. Controls may be preset before launching, but these may be overridden by distant radio.

Science News Letter, May 13, 1950

Transparent Boxes



You will find maximum protection with complete visibility for specimens of all kinds, small parts, etc. You will find innumerable other uses for these convenient boxes. Carry these boxes on field and camping trips to protect fragile specimens.

Model
 A (15/16"x15/16"x3/4") 20 for \$1: 100 for \$4.50
 B (1 1/8"x15/16"x3/4") 15 for 1: 100 for 5.60
 C (1 1/8"x 1 1/8"x3/4") 12 for 1: 100 for 6.60

(Postpaid if remittance accompanies order)

Send a trial order today
 Dept. TP-SNL

R. P. Cargille

118 Liberty St. New York 6, N. Y.

PHYSICS

Electronics May Tell If Eggs Fertile

➤ ADVANCES in electronics may soon produce a machine U. S. hatcherymen have long dreamed of owning—a device to tell whether a freshly-laid egg is fertile.

The possibility was described to the Washington section of the Instrument Society of America by Karl Norris, an engineer at the Department of Agriculture's sprawling research center in Beltsville, Md.

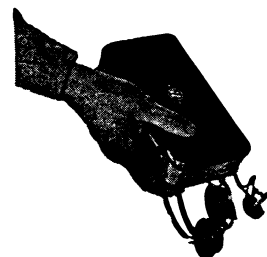
Assuming that the egg comes before the chicken, farmers have long scratched their heads and ground their teeth over the question: Which egg? The only way to tell is by trial and error—incubate eggs at random. Those which aren't fertile must be thrown away, an expensive procedure.

Scientists suspected as long as 50 years ago, however, that a tiny difference in response to electric current could show whether an egg is fertile. But instruments which could detect so small a difference were non-existent.

All that is needed, Mr. Norris said, is a practical device which can measure a few millionths of one volt. It is possible to develop such an ultra-sensitive instrument today, he said.

Science News Letter, May 13, 1950

DETECT URANIUM!
The "SNIFFER"
 Famous Geiger-Mueller Counter



LOCATES RADIOACTIVE ORES

Rushed to you **\$54.50** complete! ready to operate! **\$5.00 pp prepaid**

A precision Geiger-Mueller counter made by the leading manufacturer of nuclear instruments for government and university laboratories . . . Weighs approx. 2 lbs. . . . Extremely sensitive, yet rugged . . . Very loud signals . . . Operates on two flashlight cells . . . Anyone can operate the "SNIFFER" . . . widely used by geologists, amateur prospectors, large mining companies, and County, State and U. S. government agencies.

Tell Us Your Particular Need
 Other Geiger Counters to \$750.00

Mail Orders

Promptly Filled From Stock

The RADIAC Co.

Dept. GM-1
 489 5th Ave.
 New York 17, N. Y.

