

## THE SCIENTIST AS HUMANIST AND STATESMAN

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### Abstract

Science has become a part of everyday experience. Man, in his complete reliance on tools sometimes loses sight of what he is building; thus, such tools have stunted or confused the search for meaning and purpose. The tools of law in its traditions and stability must be coupled with scientific innovations. While scientists strive to unify the sciences, so also must the sciences be unified with the law. However, scientists should never tire in urging the law to catch up with them. What law and policy ask of scientists is no small feat. Not only do scientists have to convince government leaders, but their advocacy must stretch to every sector of society. Our nation's dedication to science and technology and the purpose behind it is an explicit State policy. Section 17, Article II (Declaration of Principles and State Policies) of the 1987 Constitution provides that the State shall give priority to education, science and technology, arts, culture and sports to foster patriotism and nationalism, accelerate social progress, and promote total human liberation and development." Scientists are urged to propagate the tradition of science that teaches individuals and, ultimately, nations, the power to dream, to create, to act, to reason, and if it fails, to try again. This is not only within the power of science to do, but the power of science in a democracy.

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### Science, a part of everyday experience

Perhaps from the standpoint of a scientific layman – with “scientific” in quotation marks – I can only declare with authority the speed with which scientific theory has become part of our everyday experience. Much of this transformation has occurred in my lifetime. We have learned to utilize atomic power for both destructive and constructive purposes, and the Internet has evolved from a military exercise to the plaything of toddlers. The world watched as man took his first steps on the moon and we recorded it in its original black and white splendor so we continue to share this moment with our children. In international fora which I attended, Justices and Judges were exposed to discussions on, among other things, the role of the courts vis-à-vis human and medical genetics, agricultural biotechnology, biotechnology-related cases involving human dignity, human rights and human nature, global biodiversity, environmental damage and compensation, sustainable development, and bio-terrorism.

Indeed, the marvels of science and technology astound and confound us. The farther we go from the earth, from the moon to Mars or to Saturn’s rings, we increase the capacity of men and women to dream and create, and inspire us to push limits. However, we find that, in many cases, the humanitarian purposes of the inventions are yet to be clearly defined. I would therefore commiserate with Einstein in his fears. In the aftermath of the destruction of Hiroshima and Nagasaki he said that “[o]ur world faces a crisis as yet unperceived by those possessing power to make great decisions for good or evil. The unleashed power of the atom has changed everything save our modes of thinking...” Einstein saw the difficulty of mankind in catching up with our inventions. The world can only watch as knowledge in science has grown to proportions beyond what our human experience can fathom. Our problem lies in that human experience; the amalgamation of all that we know in faith, family, and country is the ultimate measure of our ability to make value judgments: what is right or wrong, what is just or unjust, what is good or bad. To accept this acceleration without evolving our way of thinking may validate Einstein’s prediction that we now “drift toward unparalleled catastrophe.”

Einstein had dire predictions. Unfortunately, they are not so farfetched if we take into account how nuclear weapons are being used as a bargaining point for sovereign demands; or that chemical or biological warfare and weapons of mass destruction threaten the existence of peoples and races or to subjugate nations or perpetuate political ideology; or that the cure for diseases can be used as leverage during trade negotiations.

But I am not drawn towards these ultimate predictions. The fears exist, yes, and I can only agree that mankind is struggling to catch up with the meaning of its

inventions. Still, I cannot but be hopeful. The reason is because I believe in a democracy.

### Science and democracy

The tradition of a democracy has much in common with that of science. What else is science but a series of laborious trials and errors with its rare but glorious moments of enlightenment? Where would science be if old ideologies, some of which were established for centuries, could not be questioned or overturned? In other words, what is not science also, but creation and destruction, of birth and rebirth? Such also is the case in a democracy. A democracy is not about perfect laws, absolute freedom, or limitless rights. Where would we be if not allowed to make mistakes? Democracy has had its share of successes and errors; it is made by people who know, or should know, that while laws are meant to be timeless, they are not written to predict all possible outcomes. Among the virtues of a democracy is that laws are not always meant to forecast societal change, but leaves it to the wits and freedom of women and men to adopt to change.

Needless to stress, we find the chasm between science and values to be increasing, and still we stand in the middle, with many at a loss in the absence of a compass. No matter how much scientific thought and reasoning have empowered mankind thus far, many have forgotten that these are essentially tools to understand and serve humanity and our natural environment. Our complete reliance on tools while losing sight of what we are building has stunted or confused the search for meaning and purpose. This can only be discovered by using the tools of science and law together.

### Science and law

The study and goals of science and law are similar in that both are but tools to seek truth through the use of reason. But there is an important distinction. On the one hand, science is driven towards innovation and constantly fuels change. The imagination and industry of scientists keep us in a constant state of surprise at how we can always be a little bit better than we conceived. On the other hand, the law is ultimately normative and defined by traditions that are jealously guarded. The law is meant to provide foundations, which is not wont to change except in light of strong evidence of social, cultural or even professional acceptance. So it is that the law, a vague reflection of human experience, often takes longer to manifest what may be obvious to all of you as scientists.

I am sure that we would all wish that decision makers be the technocrats or specialists who are as well versed in the policies they draft, interpret, or implement. I am sure you have experienced how easily policy can be diluted from the time it is written until the time it is executed. But not everyone can be a technocrat or specialist, and perhaps better that it cannot yet be so. For the people are not yet technocrats or specialists, and the aim of law and government is not only economy or financial development. As found in our Constitution, the sovereign Filipino people implore the aid of Almighty God in order to build a just and humane society. It talks of our ideals and aspirations and the common good, and of securing for ourselves and our posterity the blessings of independence and democracy under the rule of law and a regime of truth, justice freedom, love, equality and peace. A government of the people must be holistic and represent and balance the many and diverse priorities of the people.

The tools of law in its traditions and stability must be coupled with your innovations. Where you strive to unify the sciences, so also must the sciences be unified with the law. I only ask that you never tire in urging the law to catch up with you.

What law and policy ask from you is no small feat. Not only do you have to convince government leaders, but your advocacy must stretch to every sector of society. In the criminal justice system, for example, it is not only a matter of convincing the judge of the relevance and reliability of a piece of scientific evidence or theory, but also all the other pillars in the criminal justice system. There are also the investigators and the prosecutors, as well as the community whom you serve. It is not only the legislators and policy makers, but also the constituents they represent who must be convinced of the greater good you are trying to achieve. The beauty of a democracy is that it knows that women and men are not perfect, and therefore allows for change. Educating the people, promoting their ability to understand these changes, encouraging the free and bold exchange of ideas, remain the key.

As with all scientific endeavors, your efforts have had the greatest rewards. In the United States, where class distinction between black slaves and citizens had been justified in the 19<sup>th</sup> century, the case of *Brown v. Board of Education* (347 U.S. 483) in 1954 marked the desegregation of whites and blacks in public elementary and high schools. The decision penned by Chief Justice Warren tested the limits of the "separate but equal doctrine" where segregation was thought to be justified as long as the segregated schools offered, "substantially equal facilities." Mr. Warren cited several authorities on the psychological effects of segregation and how such tangible factors as the number of teachers or books cannot alone measure the value of the facilities that were being offered.

Only recently, the Philippine Supreme Court explicitly affirmed the use of DNA testing to identify the perpetrator of the rape. This was in *People v. Yatar* (G.R. No. 150224) decided on 9 May 2004, where the Supreme Court affirmed the conviction of

a man who had raped and murdered a seventeen-year-old girl. Since the Court is constrained to act only when a case is filed and ripe for adjudication, the use of DNA had taken long in coming. Where in earlier cases (*People vs. Vallejo*, G.R. No. 144656, 9 May 2002; *Tijing vs. Court of Appeals*, G.R. No. 125901, 8 March 2001) the Court could only refer to DNA's use or reliability, *People v. Yatar* laid down the necessary steps in ensuring the purity of DNA sampling to uphold its integrity as evidence. This could not have been done without the efforts of the scientific community, through their studies and cooperation by being expert witnesses and, more importantly, the willingness to share knowledge and the ability to communicate its relevance to the courts and to the other pillars of justice.

This is a lot to ask for in advocacy of science. But as in the case of *People v. Yatar* the punishment of such a crime, or in reverse, the exculpation of a potential innocent serves the utmost in ensuring the determination of the truth in the courts of law. This is but a small example of your power. What more when our citizenry is likewise educated of their own capacity and trained in the art and science of logic and reasoning, who would be left to ignore the sober but compelling voice of science and passion? It is no wonder that Maximo T. Kalaw described scientists as "the new public thinkers, people who not only know things but who shape the thoughts of their generation." The scientists must be the statesmen.

### **A progressive Philippines anchored on science**

This brings me to the theme of your 26<sup>th</sup> Annual Scientific Meeting: "On Being and Becoming, Where We Are, Where We Want to Be." No doubt it expresses noble and grand objectives. It demands a solemn pause and deep reflection for it speaks of life and its purpose; of change and growth; of responsibility and service. Yet we only need to look at the vision of the National Academy of Science and Technology to get our bearings: "A progressive Philippines anchored on science." This vision of the Academy is reflected in our Constitution.

Our nation's dedication to science and technology and the purpose behind it is an explicit State policy. Section 17, Article II (Declaration of Principles and State Policies) of the 1987 Constitution provides that the State shall give priority to education, science and technology, arts, culture and sports to foster patriotism and nationalism, accelerate social progress, and promote total human liberation and development." To further elaborate on this policy, the Constitution dedicates one Article (Article XIV) out of eighteen to Education, Science and Technology, Arts, Culture and Sports. This Article XIV devotes a sub-article, with four sections, on Science and Technology, whose opening section (Sec. 10) asserts that "Science and technology are essential to national development and progress."

The subsection on Science and Technology, along with the subsections on Arts and Culture, as well as the Article on Social Justice and Human Rights (Article XIII), are unique additions to our own Constitution.

Concretely then, science and technology are indispensable to the acceleration of social progress and the promotion of total human liberation and development. Put in another way, science and technology are indispensable in serving and promoting life itself by securing for all a balanced and healthful ecology and ensuring humanity against the forces of decay, such as hunger, disease and death. Science and technology are indispensable instruments in the building of a just and humane society. As envisioned then by our Constitution, scientists and technologists must be humanists, statesmen, patriots. As humanists they listen to Einstein's words: "Concern for man himself and his fate must always form the chief interest of all endeavors. Never forget this in the midst of your diagrams and equations." And these words of the Gospel must constantly inspire you to serve others: Put out into the deep (Luke 5); take care that the light in you does not become darkness (Luke 11); Be not afraid (Matthew 28; Luke 243); and the harvest is abundant but the laborers are few (Luke 10). With the Constitutional mandate and these thoughts, the heart and the response to the theme of your 26<sup>th</sup> Annual Scientific Meeting are not difficult to find.

As I stand before the legally mandated scientific policy advisors of the country, where at least fifty lifetime members possessing doctorates in various fields of science and technology congregate as "the principal reservoir of scientific and technological expertise in the nation," (Sec. 1, P.D. No. 1003, "Creating the National Academy of Science and Technology," 22 September 1976, amended in 16 December 1976). I see a special repository of humanists, sacrificing patriots and able statesmen fully recognized to assist the nation in carrying out the purposes of our Constitution. Truly then, the National Academy of Science and Technology Philippines has the mandate of the sovereign will of the people.

Yours is a tradition of professionalism, of precision, of sobriety, of creativity, of imagination, all founded on the proven integrity of your experiments and studies – all of your life's work. If integrity be your legacy and what makes you the experts that you are, then by no means should your voices be stifled.

### **The power of science in a democracy**

Let science then be the tradition through which we can become fearless when we seek to reinvent ourselves. Let progress not be our ability to hold fast to what we once were. Propagate the tradition of science that teaches individuals and, ultimately, nations, the power to dream, to create, to act, to reason, and if it fails, to try again. This is not only within the power of science to do, but the power of science in a democracy.

Let your knowledge be your tools, but concern for humanity in general and the Filipinos in particular always the aim. Our country is in need of no less.

May you come out with concrete proposals to strengthen the Constitutional role of science and technology in the acceleration of social progress, promotion of total human liberation and development, and in the building of a just and humane society.