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THE ADVANCEMENT OF LEARNING IN THE UNITED STATES IN THE POST-WAR WORLD[1]

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IT is a great honor to have the privilege of giving the Franklin Medal lecture. The subject I have chosen is highly academic, but for this I offer no apologies to a distinguished audience. The matters which I shall treat are primarily of concern to scholars, yet, as I shall attempt to demonstrate, their implications affect the lives of all the citizens of this republic. And conversely, the attitudes and actions of the lay public will determine to no small degree the future of the world of scholarship. In short, my remarks to-night are in the nature of a footnote—an American footnote—to a discussion of the problem of the relation of society to scholarship, or, if you will, of the scholar to the nation.

[1] Franklin Medal lecture, given at the American Philosophical Society, Philadelphia, November 19, 1943, in a Symposium on the Organization, Direction and Support of Research. *Proceedings*, Am. Philos. Soc., Vol. 87, No. 4.

I

It is clearly impossible to discuss the advancement of learning in the United States without making some assumption as to what these United States will be like in the next two decades. For example, if by some miracle Hitler should succeed in forcing a stalemate, the omens would not be auspicious for the advancement of learning or for many other human activities—quite the contrary. We should be living in an armed camp, the authority of the Federal Government would be paramount and the national policy would be largely determined by military necessity. Except in certain specialized fields, knowledge would not advance. Similarly, if a period of social crisis were to be followed by a highly regimented society, the advancement of learning would soon fail to prosper. Under such conditions, whether the strong arm of govern-

ment were swung from the right or from the left, the effect would be the same; an official doctrine would cast an ominous shadow of fear over all discussion; dogma would take the place of free inquiry.

There is no need to labor the point. Those who have eyes to see or ears to hear know what has taken place across the oceans, and they tremble when they visualize the impact of society on science, or rather they tremble when they realize the effect of the impact of certain types of society on science and learning.

But history shows us that it is not only modern totalitarian societies which put learning in a straitjacket. There are insidious poisons which may arise from every pore of the social structure and without benefit of the police or a "party line" suffocate the human urge to know and to understand. I venture to remind you of Gibbon's classic description of the highly stratified society of Byzantium:

> They held in their lifeless hands the riches of their fathers; without inheriting the spirit which had created and improved that sacred patrimony: they read, they praised, they compiled, but their languid souls seemed alike incapable of thought and action. In the revolution of ten centuries, not a single discovery was made to exalt the dignity or promote the happiness of mankind. Not a single idea had been added to the speculative systems of antiquity, and a succession of patient disciples became in their turn the dogmatic teachers of the next servile generation.

If the United States of the 1950's and 1960's is on the road to a civilization like that of the Byzantine Empire or like that of certain totalitarian nations in the 1930's, there is no use in discussing the advancement of learning. For the phrase no longer has the meaning given to it by Francis Bacon; it no longer carries those implications which have raised the hopes of countless men and women who have echoed his words through more than three centuries of ever-increasing liberty.

There can be no escape from the conclusion that if we are to talk about the advancement of learning, we must postulate the continuance of a free society. Can we accept such a postulate for the United States in the years ahead? I believe we can without hesitation. I say this in spite of the apprehension of many (which I share) as to the effect of the trend of this century towards collectivism, a trend reinforced by the demands of war.

I make this confident assertion as to the continuance of a free society because I believe we shall win not only the present war but the subsequent second battle for freedom. This second battle for freedom will start when the military might of Germany and Japan has been overthrown. It will be a battle not of planes or tanks or ships, a battle not of men against men but of a nation against threatened calamity. It will be the fight of a free people to continue along their historic line of development, a free people committed to the ideal of a fluid society with equal opportunity for all. It will be a fight to maintain a truly competitive system based on individual initiative arising afresh in each new generation. It will be a fight to make a competitive capitalistic system work in spite of the complexities of modern industrial life —to make it work, furthermore, in the face of the apparently overwhelming obstacle of the demobilization of a military undertaking which staggers the imagination.

I believe we shall win this second battle for freedom by keeping our blood pressure down and our chins up; we shall succeed by continuing the spirit of national unity achieved in time of war, by putting the nation's welfare ahead of personal desires, by clear and quick thinking on the part of experts and leaders alike even in the face of what some may proclaim to be "imminent disaster." And I believe we shall come out of this second battle for freedom without having witnessed the violence of revolution or counter-revolution and without having broken the continuity of our tradition.

We in the United States are the heirs of both the American and the French Revolutions. Nowhere else in the world have so many men for so many years acclaimed the ideals which are expressed by such phrases as: "liberty, equality, fraternity" and "life, liberty, and the pursuit of happiness." Nowhere else in the world have the slogans, "equality of opportunity" and "there are no classes in this country," expressed national ideals from which few ventured to dissent. Yet all who are not vainly trying to live in a past century know the force of a terrible question which has been raised throughout the western world—the question, how can these democratic ideals be in fact made a reality for the many, when vast economic power is wielded by a few. We shall evade this question at our peril. For it is only by facing it squarely that we shall find the answer; and it is only by finding the answer that we shall evolve a uniquely American civilization which will be, indeed, the promised land for those who would be adventurous and free.

II

Free inquiry—these words sum up, as well as any, the necessary condition for the advancement of learning in any age. The scholar must be free. He must be free both from intimidation and from control by government. He must inquire and speculate with as few restraints as possible. Yet history shows that the advancement of learning has not proceeded in a social vacuum. In those times when the advance has been

most spectacular, when groups of eager young men pressed forward in a new direction, there were strong forces at work which determined to some degree the objectives on which men of learning set their eyes. No one familiar with even the outlines of the record of the advancement of learning in the last three centuries can doubt that fact.

A controversy has been in progress during the last decade, however, as to the variety and kinds of social forces which have conditioned the behavior of scientists and scholars. This controversy stems from the application of the orthodox Marxist doctrine to a historical problem, namely, the relation of science to society. According to the Marxist view, "science is the product of the economic conditions of society, and its social function is to benefit the ruling classes of society." When applied to the work of Sir Isaac Newton, for example, this interpretation of the past leads to the somewhat startling statement that "Newton was the typical representative of the rising bourgeoisie, and in his philosophy he embodies the characteristic features of his class." Furthermore we are asked to believe that the scheme of physics with which he was concerned "was mainly determined by the economic and technical tasks which the rising bourgeoisie raised to the forefront." And the proponents of this twentieth century doctrine are ready to laugh out of court any who prefer a more heroic reading of the history of science; they will throw in their faces with a jeer Pope's famous lines:

> Nature and Nature's laws lay hid in night;
> God said "Let Newton be!" and all was light.

But the sin of oversimplification may not lie entirely with the eighteenth century poet. This is made evident by a critique of the Marxist position from the pen of a distinguished historian, Professor G. N. Clark, in a small volume on "Science and Social Welfare in the Age of Newton." But the discussion continues. Two brilliant scientists of Great Britain line up on opposing sides. Bernal's "The Social Function of Science" is answered with vigor by Polanyi's "The Rights and Duties of Science" in his book, "The Contempt of Freedom."

As one interested in the history of science, I hope the debate will continue. But it seems evident that the economic interpretation of the history of science no less than the economic interpretation of general history can be pushed to absurd and extravagant lengths. The progress of pure science, for example, has been clearly in part a response to utilitarian stimuli. However, it is easy to show that this is not the whole story. Even the relation of science to industry, for example, is a highly complex affair. As I suggested here in Philadelphia last winter, neither the scientist nor the industrialist has been a parasite, the one living on the other. Rather, we are dealing with a case of symbiosis. If this be so, the healthy advance of physics and chemistry in the future will be assisted by a clear recognition of the symbiotic relation which these sciences bear to progress in technology.

Even when we consider only the field of experimental science, it seems evident that social forces other than economic have played an important role in relatively recent times. For example, the foundation of the Royal Society was closely connected with English Puritanism during the Cromwellian period. One can even make a very plausible case, following the lead of Max Weber, for a relationship of cause and effect between dissenting protestantism in general and the urge to follow Bacon's advice and advance learning for both godly and material reasons.

If the scientific movement in England in the seventeenth century came largely from dissenting and rebellious quarters, English scholarship in the field of history after the Restoration was the beneficiary of the opposing current of orthodoxy and loyalty to the Sovereign. A concern for the historical foundation of the Anglican church and doctrines led a number of ardent royalists to become great scholars. But this type of motivation is, of course, a recurrent factor in the history of scholarship. From the Middle Ages until the eighteenth century, theological controversy, philosophical inquiry, and the study of antiquity were almost inseparably interwoven.

In short, as we view the advancement of learning over a considerable span of time, the ivory tower seems conspicuous by its absence. The scholar may imagine that he is as free as a pioneer in a virgin forest, yet those who trace his wanderings from a distance can discern the effect of many varied social forces. Indeed, it would be my contention that certain types of strong social forces must play upon the world of scholarship if the spirit of learning is to live and flourish. Paradoxically, free inquiry must be powerfully polarized if inquiry is to prosper. This will be particularly true, it seems to me, in the highly industrialized age which lies ahead. For if free inquiry is but an aimless, leisurely ramble amidst delightful scenery, it is likely to become an occupation only for the old and intellectually infirm.

Professor Bernal warns that "whatever the scientists themselves may think, there is no economic system which is willing to pay scientists just to amuse themselves." I am not so sure. The cost accounting methods of a democracy are not as penetrating as he assumes. But I do feel sure that if one attempts to justify a scientific or scholarly activity solely in personal hedonistic terms, the effect on the incoming recruits will be disastrous. Is it not clear that if scholarship and pure science are to flourish in a democratic,

technical society, such enterprises must be alive and vigorous? Is it not evident that they must be a part and parcel of the great adventure of the day? Only then will the ambitious, energetic, and imaginative young men of each generation be attracted to the academic and learned world. And it is on the recruitment of the next generation of scholars, I may remind you, that the future of each age of scholarship depends.

From all this I am sure no one in the audience will dissent. A debate might well develop, however, if we were to try to distinguish more closely between those forces which may polarize the field of learning disadvantageously and those which are beneficial in their action. The Marxists among you, if there be any, would certainly make free use of the idea of social utility and would not be too much worried if society rather frequently demanded an accounting from the scholar in those terms. Others among you would both repudiate the validity of the test of utility and be shocked by any suggestion of an accountability of the world of scholarship to those who stand outside.

Personally, I view the question not primarily in terms of the degree of coercion of the scholarly by the masses; but rather as a problem involving the quality of the appeal that the scholar can make to the brilliant and enterprising sons and daughters of those who constitute the masses. And I think this appeal should be couched neither in utilitarian terms nor in those appropriate to a secluded retreat where the academic equivalent of the slogan, "art for art's sake," is the official doctrine. Rather, it seems to me that in each area of the entire field of learning the activities under way must be manifestly relevant to the future of our civilization. The undertakings must be relevant not only to man's physical and social needs but to his highest hopes and aspirations. Relevance, not utility, therefore, I submit is the touchstone to test the vitality and validity of a scholarly enterprise—relevance to the future as we envision it.

III

To illustrate how the relevance or lack of it in scholarly undertakings may be assessed, it is essential to deal separately with widely different types of intellectual activity. For this purpose the conventional academic divisions are quite unsuitable. Therefore, I propose to follow Francis Bacon in trisecting the whole field of learning, but to take great liberties with his definitions.

In the second book of the "Advancement of Learning," Bacon wrote as follows: "The parts of human learning have reference to the three parts of man's understanding, which is the seat of learning: history to his memory, poesy to his imagination and philosophy to his reason."

Three centuries of the very activity for which Bacon was pleading throughout his famous treatise have made his classification now inadequate. In the twentieth century we have a vast fund of knowledge accumulated by the labors of historians, archeologists, experimental scientists and observers of natural history. We roam freely in fields of which the author of the "Advancement of Learning" never dreamed. And we are confident that the process of expansion has far from reached the end. With Mr. Churchill we can believe that "the empires of the future will be empires of the mind."

Looking back over the journeys of the pioneers who opened the new vistas for us, we can speak with assurance of the advancement of learning. Indeed, here and there we can even hazard an opinion as to the rate of progress and complain about those times and places when it seems unduly low. Seen in historical perspective, many products of man's memory and reason must be classified together. From this point of view the labors of a dozen generations of experimental philosophers are clearly more closely related to archeology than to what is now embraced by the term philosophy. Mathematics, likewise, has undergone a similar development.

Bring back to life a student of antiquity of a century or two ago and confront him with the present status of archeology and ask him whether or not learning has advanced. Can there be any doubt as to his answer? Repeat the hypothetical operation in physics or biology or mathematics and ask the early investigator whether or not he would have counted himself blest by fortune if he could have stood where his successor stands to-day. I may remark parenthetically, that this imaginary operation can be performed with considerable assurance, using much shorter intervals of time and more restricted areas of interest. By so doing one can give meaning to the word progress as applied to intellectual undertakings.

We would do well, therefore, to merge portions of Bacon's two classes (his first and third), history and philosophy, into one which we may designate "accumulative knowledge." In this area we can speak of the advancement of learning and indeed apply such tests as I have suggested to see whether or not learning has advanced over the course of the last few generations. We can even estimate the chances of further rapid progress on a given restricted front. And such estimates are of profound significance in regard to this question of the relevance of scholarly activities. For in a free democratic society dedicated to the preservation of the dignity of the individual, I believe a true advance in learning will always be considered relevant. Quite apart from any idea of utility (however we stretch the word), I am convinced that intelli-

gent men and women in the sort of America I have dared envisage for the 1960's will be ready to cheer each new step forward; they will be ready to acclaim the acquisition of new territory by the "empires of the mind."

But let us be quite certain that we do not mistake the mere acquisition of information for an advance in knowledge. For the piling up of new facts may or may not be relevant to future intellectual progress or to society's needs. All who are familiar with the history of the physical sciences know that there has been a tremendous amount of thrashing around in the underbrush even during those times when giants were hewing out dazzling paths through the virgin forests. Or to vary the metaphor, we are all aware of how many scholars have continued to dig assiduously but unprofitably in exhausted mines. All of which is inevitable and trivial except when loyalties and traditions urge men to claim either that digging is a worthwhile activity in and for itself, or that the yield from an exhausted vein is full of gold.

It is at this point that the argument between "science for science's sake" and social utility begins. It may soon degenerate into an argument for the continuation of a particular line of intellectual activity merely because this has once been a fruitful direction of adventure. The argument soon becomes an emotional defense by those who love the field in question and who endeavor to support their loyalty by an appeal to general principles of the sacredness of all knowledge. At this point young scholars start leaving the academic halls. Society becomes impatient. And rightly so.

IV

Let me now turn from the first category—accumulative knowledge—to the other two which, following Bacon closely, I shall designate as poesy or, if you prefer, poetry and philosophy. Whereas the idea of progress is both valid and significant in the first category, accumulative knowledge, in the other two the concept is not only invalid but a positive deterrent to relevant undertakings. And at this point, lest all but scientists, mathematicians and archeologists leave the room in protest, I hasten to assert that I place no halo over the word progress. There is no hierarchy implied in my classification.

Indeed, any one who wished to give poetry or philosophy an inferior place as compared to accumulative knowledge would soon find himself in an untenable position. For it is obvious that poesy or poetry on the one hand and philosophy on the other together hold the keys to man's immediate future, including the future of the advance of accumulative knowledge. That this is so, current history provides ample proof. Nazism triumphed in Germany not because the Germans were lacking in power to advance learning but because bad poetry and a wrong philosophy prevailed. Remember that unless we are to have a free society there will be little chance for progress in understanding the world of animate and inanimate nature in which we live. And yet this progress or the lack of it will affect only slightly the freedom or the lack of it in the United States in the postwar years. On the other hand, the ideals, the hopes, the ambitions as well as the doubts, the anxieties, and the fears of millions of men and women may well prove decisive. And these thoughts and emotions are largely conditioned by the poetry and philosophy of the day.

There are countless vexatious questions which must be daily answered by each of us as individuals and collectively as a nation, and for which there are as yet no answers provided by our fund of accumulative knowledge. Considerable nonsense is often talked about applying the scientific method to social problems. What is this scientific method? The usual philosophic inquiries into the question seem to me a bit unreal when one surveys the range of methods actually employed by sciences as remote from each other as geology, systematic botany, organic chemistry and mathematical physics. Perhaps science is after all only organized common sense, preferably derived from experiment and preferably organized on a quantitative basis.

Perhaps by the scientific method one means only an impartial examination of a situation, an honest attempt to use rational powers to analyze complexities. If so, the phrase is badly chosen. It blinds us to an important distinction between situations where value judgments are by necessity involved and those where they can be eliminated from the frame of reference. Only in the latter case are methods comparable to those used in the advancement of knowledge really applicable. Yet the difference between disciplined and well-informed judgments involving values on the one hand, and on the other extravagant and ignorant opinions, is the difference between civilization and barbarism.

One of the chief ends of education is surely to develop the capacity for making civilized judgments on all those matters of value which are involved in so many vital human decisions. Such judgments can be illumined often by our knowledge of the past experiences of the race, but they are largely determined by emotional reactions and channels of thought whose pattern by necessity varies from age to age. It is thus the poetry and philosophy of the present, rather than accumulative knowledge, which play the significant role in outlining the next act in the drama of world history.

If we use the term poetry to cover all creative insights into human destiny whatever their form may be, and the word philosophy to include the whole expanse of analytical and speculative thought except for mathematics and the sciences, we see that many aspects of a scholar's labors fall within these bounds. Together with accumulative knowledge these two classes comprise the field of secular learning. All matters closely related to religious faith must form a fourth category. With their relation to society and the scholar, I do not propose to deal to-night. For, in the phraseology of Bacon, I am not trespassing on the field of divine learning, but confining myself entirely to that of human learning.

With this limitation, all the usual fields of scholarly activity are included in the three categories I have named: accumulative knowledge, poetry and philosophy. Many cut across two and even all three. For example, history as an interpretation by the present of the past must rest on accumulative knowledge, but consciously or unconsciously reflect the philosophy of the writer; and it has been said more than once that every great historian is not only a historian but a poet. In general, the humanities and the social sciences, to use our modern terms, cut across all three fields, and only rarely does the major part of a traditional subject fall within the boundaries of accumulative knowledge. For this reason it would seem a grave error to treat these disciplines as though the increase of accumulative knowledge (an advance in learning) were the significant aspect of the undertaking. Only in a very few instances is that true to-day, in my opinion.

The significance of poetry and philosophy is not to be measured in terms of progress or advance. Try, for example, my imaginary operation of bringing back to life great figures of the past. We can hardly doubt how Galileo, Newton, Harvey or Winckelmann would respond to a glimpse at the contemporary answers to the questions which they raised. It is far otherwise with Michelangelo, Rembrandt, Dante, Milton or Keats. It is far otherwise with Thomas Aquinas, Spinoza, Locke or Kant. You and I might argue until midnight whether or not the particular artist or poet or philosopher would feel that the present state of art or poetry or philosophy was an advance or a retrogression from the days when he himself was a creative spirit. There would be no unanimity among such an audience as the one I am addressing to-night; and more significant still, no agreement between the majority view which might prevail here and that which would have prevailed in a similar gathering half a century ago.

We are not dealing with accumulative knowledge when we speak of poetry or philosophy. We are dealing with something far more vital, in a sense far more practical; something that affects for better or worse the ambitions and the conduct of civilized man. The advance of learning is here a trivial matter; relevance is tested by the ordeal of battle. New disciples will flock to those masters who sit not in an ivory tower or with their vision fixed on a by-gone day, but who endeavor to understand and interpret the scene that unfolds year by year before their eyes; or to those others who, alive to the significance of the present, seek to bring nourishment and enlightenment from the wisdom of the past.

It has been well said that a poet's garden should be not in the market place but hard by. By the same token, a university—the home of scholars—should be bounded by both the market place and the poet's garden. This location presupposes, of course, that there will be ample opportunity for communication over the academic walls. The philosophers and those who seek to advance learning, I assume are largely academicians. How much they should also be either poets or active in the market place is an open question. As far as the accumulation of knowledge is concerned, the problems involved are rather superficial. The relation between pure and applied science can be adjusted with little difficulty and to the mutual advantage of both the progress of science and the welfare of society.

The same is true of those aspects of social science which are clearly concerned with accumulative knowledge. But when we come to the more usual case, where large elements of philosophy and some poetry are admixed, the situation alters. Since the relevance of such undertakings depends on their relevance to the ideals of the future which arise from the maelstrom of the present, one can maintain that the social philosopher must travel constantly between the market place or forum and the academic halls.

On the other hand, a well-known economist has expressed the view that

> the service of social science and the practice of the arts of democratic government are vocations each of which may be pursued with sincerity and singleness of purpose, but they cannot be combined. A social scientist cannot become a politician by speech or writing or affiliation without losing value as a scientific investigator and a teacher. Without derogation from essential academic freedom, those who choose the academic vocation in the social sciences should impose on themselves reticences and self-denials in the political and practical field, which would not be necessary for teachers of other subjects, but are necessary to give to the social scientist that emotional detachment from his subject which comes naturally to the biologist or chemist.

It may be a surprise to many to learn that the au-

thor of these words is Sir William Beveridge. The quotation is from his farewell address to the London School of Economics in June, 1937. The sentiments expressed are directly contrary to what is current practise both here and in Great Britain. Which view is right?

I wonder if the answer is not to be found in the distinction I have endeavored to maintain between accumulative knowledge and philosophy. If we call those whose aim it is to advance learning scientists (though this is bad nomenclature), then if a professor wishes to be a social scientist he may well follow Beveridge's admonition. If, however, he is a social philosopher and wishes his thinking to be germane to the problems of the day, he can hardly fail to become identified with politics from time to time—that is, he will take a position that results in his being affiliated in the public eye with an issue which has become political. In a sense he is an applied scholar and his political activity is as much a measure of his stature as the corresponding field activities of an applied scientist or engineer.

The difficulties seem to me to arise primarily because confusion reigns over what is social science and what social philosophy. Or, perhaps, more often the confusion arises because a given professor endeavors to be at the same time a social philosopher and a social scientist. I think the academic world needs both; but I doubt if they can be combined in a single individual for the reasons Sir William Beveridge has pointed out. Furthermore, I think the distinction between the two types of individuals might well be made explicit with advantage to both the public and the universities.

I have assumed that a major share of both advancing learning and fostering philosophy will be the responsibility of the universities in the years ahead. Research institutes will, of course, also play an important part, particularly in the applied sciences including medicine. But by and large the more fundamental the scholarly or scientific work, the more difficult it is to provide for it in advance. The exceptional man turns the unexpected corner in ways which can not be foreseen. No one can designate the targets in advance. This fact makes difficult the organization of research even in applied fields. It practically makes impossible the planning of research in other areas. The scholar must be a free agent and may or may not be productive. This being the case, it is unlikely that society will foot his bills: hence a larger share of scholarly undertakings must be coupled with another activity, namely, professional teaching. And the organization of our universities must be kept as flexible as possible if they are to serve the nation as they should. Whenever we are fortunate enough to see a man of genius emerging, he should be given the greatest possible scope within a university. The usual academic compartments should not confine him either in his relation to the students or to the investigation which he has in mind.

Our scholars will be teachers. I except only the fields of applied science, including medicine. I base this prophecy on the past history of the methods by which society has supported the advancement of learning even in times of unqualified enthusiasm. But whether or not the combination of professional education with scholarly endeavors is the most likely way of financing the latter, is it not essential that our intellectual leaders be in close contact with the most promising youths of the uncoming generation? There is no other way in which we can be certain that the current of intellectual adventure will continue to flow vigorously ahead.

In the United States we have many different types of institutions of higher learning. This is fortunate for several reasons. In the first place, we can rest assured that only drastic action could enforce a regimentation. In the second place, the number and variety of our universities spell assurance that there will be intensive competition. This in turn means we shall continue to provide adequately by one means or another for exceptional scholars and brilliant teachers. These two advantages are great, indeed, and far outweigh the evils inherent in the inchoate educational system which to outsiders seems often both inexplicable and thoroughly unsound.

The great flame of war which has seared all of Europe places heavy responsibilities in our hands. A large share of the future of the scholarly activities of the world must be carried on in the next decade on this continent. To meet this challenge we need invoke no powers of the Federal government, nor embark on a vast program of building special institutes for scholarly undertakings. We need not organize into a hierarchy our institutions of higher education. We need only make certain that to foster the spirit of free inquiry shall be an ambition of the American people. We need ask only that the nation support our diversified American universities, not only as educational institutions but as communities of scholars. If the response be favorable, for the rest we need have no fear.

V

Now in conclusion, may I say just a word in answer to the obvious criticism that in trisecting the field of intellectual activity in a new and arbitrary fashion I have destroyed the unity of the ancient society of scholars. To my mind, the unity of the world of pure learning (including science, philosophy and

as much of poetry as the writers, artists and poets will allow) is based not on a common method but on a common motivation. Perhaps, I should rather say dedication. For the scholar, the seeker after truth, whether he be mathematician, archeologist, scientist, philosopher, poet or theologian, must come into the court of public opinion not only with clean hands but with a consecrated heart. He must have integrity of purpose, a disciplined imagination and the power of critical analysis both of the problem at hand and his own contributions. In addition he must have high standards of performance as to the technical aspects of his task.

His rewards are not measured in terms of material riches or the satisfactions which to many men are most enduring. For him neither wealth, nor power; neither the happiness which comes from contributing immediately to the public welfare, nor the exhilaration of being one of the builders of an expanding industrial age. Unlike the applied scientist or the social philosopher who is in the arena of active life, he will know little of the extremely unscientific problems involved in the management of men. His ambition as a scholar, a philosopher, or a poet will be merely to seek the truth with all the skill and power at his command. This he will do humbly and yet with joy and pride. For without exalting his calling above that of others, he may nevertheless hope that from his labors will issue something that the "world may not willingly let die."

OBITUARY

RECENT DEATHS

DR. ARTHUR J. TIEJE, professor of geology at the University of Southern California, died on January 25 at the age of fifty-two years.

DR. CHARLES HASKINS TOWNSEND, from 1902 to 1937 director of the New York Aquarium, died on January 28 in his eighty-fifth year.

FREDERIC WILLIAM TAYLOR, of Los Angeles, the agriculturist, died on January 12 in his eighty-fourth year.

SIR JOHN BRETLAND FARMER, botanist, a former director of the biological laboratories at the Imperial College of Science and Technology, London, died on January 26 at the age of seventy-eight years.

A CORRESPONDENT writes: "A 1943 issue of the *Bulletin of the Academy of Sciences U.S.S.R.* (Department of Technical Sciences) recently received in this country carries an obituary of Professor Sergei Alekseevich Chaplygin, member of the Academy of Sciences, who died at the end of 1942 at the age of seventy-three. Professor Chaplygin, has been the head of the Research Institute of Aviation since 1921. He is credited with important research in theoretical mechanics and aerodynamics, beginning with the development of formulas for calculation of forces acting on airplane wings in 1910. He was decorated several times by the Soviet Government. His collected works were published by the Academy of Sciences in 1933–1935, and a second complete edition has been ordered by the Soviet Government and is in preparation at the present time."

SCIENTIFIC EVENTS

THE DELHI MEETING OF THE ROYAL SOCIETY

FOR the first time since its formation in 1662 the Royal Society on January 3 held a meeting outside England. This opportunity arose, according to *The Times*, London, from the presence in India of Professor A. V. Hill, who, acting for the occasion as vice-president, convened a short session of the Royal Society, before the opening of the Indian Science Congress by the Viceroy, Lord Wavell, at the University of Delhi. *The Times* writes:

Professor Hill explained that before leaving London he had been asked by the president and council of the society to convey by this means their greetings and good will to the scientific men and women of India, and he pointed out that, although most of those present were for the moment guests, there were a few fellows among them, and the King, patron of the Royal Society, was directly represented by the Viceroy.

As already reported Professor Hill's visit to India is closely connected with the scientific aspects of the war effort. He read to the assembled Indian scientists messages of greeting from the Prime Minister and General Smuts, and from British scientific bodies, and after his address two Indian fellows of the Royal Society, Dr. H. J. Babha and Sir Shanti Bhatnagar, who have not had the opportunity of being formally admitted, signed the traditional obligation on a sheet of parchment which will be inserted in the society's charter book. Lord Wavell then declared the Indian Science Congress open.

Professor Hill read the following message from Mr. Churchill: "It is the great tragedy of our time that the fruits of science should, by monstrous perversion, have been turned on so vast a scale to evil ends. But that is no fault of science. Science has given to this generation