

INTRODUCTION

The Dignity of Science

WHEN the first atomic bomb struck the populous seaport capital of Hiroshima on August 6, 1945, the entire civilized world was profoundly shocked at the horror unleashed by science. Ordinary citizens and international leaders recoiled at the awful potential of the atomic bomb. Science no longer meant the production of useful gadgets, discovery of effective drugs, or development of quicker and better means of communication. It meant something much more, something that affects human consciences and destiny. The moral issues involved in the Hiroshima bombing and in nuclear warfare in general have been widely discussed, sometimes with considerable vehemence. But even apart from the moral issues, it is clear to many today that scientific progress has reached a precarious ledge in its lofty climb. Careful maneuvering along the ledge can indeed lead to still further heights. It is the sight of some new height still to be conquered that urges the scientist, as well as the mountain climber, forward with confident step. But a single misstep at such heights could bring on a landslide or a plunge to final doom. The alternatives are clear, and have been clear since Hiroshima: the possibility of further progress or the annihilation of civilization. Henceforth mankind has to work out its salvation in the shadow of the mushroom cloud.

The successful launching of Sputnik I in October of 1957 threw government departments, military officers, scientists, educators and journalists into panic. Incredible as it seemed, the Soviet Union had overtaken the United States in missile thrust and guidance systems. American prestige dropped, particularly in uncommitted countries; investigations were begun into the so-called "missile lag," and educators hastened to build

up the science program in schools of all sizes. Despite the fact that Soviet students of science are thoroughly indoctrinated with the philosophy of Dialectical Materialism, some American educators urged diminishing, and eliminating if possible, courses in the humanities in a frantic effort to produce more trained scientists. The panic instilled by Sputnik I almost obliterated the vision and hope of wiser educators: the molding of a human being, whether he be a theoretician or a technician. Before Sputnik I many educators realized the inherent danger to society and to the individual of excessive specialization, which neglects history, literature, culture, sound philosophy, religion and even ordinary grammar. These educators tried to give potential scientists an appreciation of the real dignity of science through the history of science, the philosophy of science, or a study of the Great Books of mankind. Because of Sputnik I this movement has suffered a temporary set-back. Perhaps after the fear and panic have subsided, there may still be the possibility of educating human beings intelligently devoted to science, rather than technicians unaware of the dignity of their pursuit.

Long before the atom bomb came to the attention of the ordinary man, an important revolution had been taking place within science itself, a theoretical revolution which, in fact, made the atom bomb possible. The story of this transition from the mechanical age of physics to the age of relativity and quantum mechanics has been written many times in this generation. The path which leads from Clerk Maxwell's hypothesis identifying magnetic and luminiferous media to the theories of relativity and quantum was constructed by many experimental and theoretical physicists. It is a path which leaves far behind the assurances of Newtonian solids in a void, the fallacy, as Whitehead called it, of "misplaced concreteness." The transition from classical mechanics to the two principal theories of modern physics, relativity and quantum, had an unsettling effect on philosophers of physical theory. Before the end of the nineteenth century Carl Neumann, Ernst Mach and Karl Pear-

son had already perceived some of the weaknesses of Newtonian axioms and some of the ambiguities in Newtonian concepts. But they were not willing to reject the basic theory of Newtonian science. Even after Planck's paper of 1900 and Einstein's theory of 1905, theoreticians of science, such as Henri Poincaré and Pierre Duhem, were unwilling to reject Newtonian principles as erroneous. Instead they conceived all scientific theories as conventional constructs and approximations of the truth. A scientific theory may be induced from experimental data; its predictions may be verified in every detail. But, for Poincaré and Duhem, the theory was only one way out of many for interpreting the data; it was an hypothetical approximation. The same data could be interpreted with equal verification by other hypotheses. The irreconcilability of relativity theory and quantum mechanics, as well as the wave and particle theories of light, gave much weight to this interpretation of scientific theory.

Later authors, it is true, have considered Poincaré's interpretation of science and hypothesis to be somewhat naïve and oversimplified, and they have rejected certain details of his conventionalism (*commodisme*). Nevertheless, the fundamental elements of his view have been incorporated into the generally accepted theory of science today. His insistence on the hypothetical character of scientific theory has, in fact, been extended by modern theoreticians beyond the limits intended by Poincaré himself. He was willing to grant certainty at least to the first principles of scientific investigation and to other types of knowledge. Obviously, he did not reduce his own philosophical speculations to the status of mere convention and hypothesis. In the currently accepted view of scientific knowledge, expounded in philosophies of science, there are three fundamental points which ought to give us pause. (1) It insists that no scientific knowledge can be taken as absolutely certain, that is, without an intrinsic doubt concerning its alterability. The hypothetical character of all scientific knowledge, it is said, requires that we accept current scientific knowledge on a tenta-

tive basis only. (2) It insists that all true knowledge must be 'scientific,' and therefore hypothetical. This means that even the first principles of scientific investigation must be regarded as hypothetical and tentative. (3) It restricts 'scientific knowledge' to investigations modeled on, and employing the scientific method of modern physics. This means that the various branches of speculative and practical philosophy, theology, history and so forth are not at all scientific, while biology, psychology, anthropology and sociology deserve the name of 'science' only insofar as they employ the unique 'scientific method' of physics.

Here is not the place to controvert these fundamental points. However, a brief comparison of modern scientific theory with the scientific optimism of Aristotle and the ancients is most revealing. Modern theoreticians apparently have abandoned hope in the power of man's speculative reason; they seem to be content with universal uncertainty and a solitary path to knowledge. Whatever may be said of Aristotle's science, he was, at least, much more confident in the powers of human reason and more appreciative of the dignity of scientific knowledge. (1) The tentative status of hypotheses and theories proposed by modern theoreticians falls far short of Aristotle's ideal of scientific knowledge. Science, for Aristotle, is the attainment of true and certain causes within reality. Such causes are, of course, discovered only after careful research and analysis. Whatever hypotheses, theories or suspicions one may have during the investigation, they are not to be confused with genuine science. Such hypotheses are indispensable and inevitable, but they are only means to the ultimate goal of scientific explanation. (2) Aristotle's lofty, and perhaps unattainable, ideal of scientific knowledge did not blind him into thinking that all true knowledge must be of this type. Defending the dignity of science against the skeptics of the Academy on the one hand, and protesting the universality of science on the other, Aristotle saw that not all knowledge can be 'scientific,' that is, demonstrable, for then there would be no beginning. He insisted that the

starting point of scientific investigation must be prior and more certain than the torturous path leading to a true solution. This starting point is the light of absolutely first principles, known with certainty before all scientific demonstration. The complex process of investigating nature was recognized as extremely difficult, but Aristotle did not think it hopeless. There is the security of an immovable starting point. (3) For Aristotle the investigation of nature occupied a preeminent place in the pursuit of knowledge; he himself devoted most of his life to it. But he did not claim this as the only pursuit of mankind. Even in the study of the world and man Aristotle recognized various approaches, each of which is legitimately called 'science.' In other words, 'science' is an analogical term, and its dignity requires that it be recognized in its diversity and complementarity. The pluralist approach to reality respects the principles, method and limitations of each legitimate endeavor. No one branch can be erected into a monolithic idol without destroying the integrity of truth and the dignity of science.

The warfare between scientists and religion cannot be subdued for long. This is not because of any intrinsic incompatibility between science and true religion, but because of the third point mentioned above. If the scientist refuses to acknowledge any theories other than those proposed by his own method, conflicts are bound to break out periodically. Today the conflict is most evident in the conception some neo-biologists have of evolution on the one hand, and the testimony of sound philosophy and revelation on the other. This was evident in the Darwin Centennial held at the University of Chicago in 1959. Some biologists claimed the triumph of science over revelation, since evolutionary theory now proves that man is no more than a form of evolved matter, and religion a superstition. Even apart from the embarrassing fact that the methodology of prehistory is far removed from that of modern physics, we might pause to marvel at this strange note of triumph. Man is no more than the beast, the weed, the puff of air! Rejoice! Man is not very much after all! Dialectical Materialism has been

saying this for over a century. Will there be no voice to defend the nobility of man and the dignity of science?

II

We have every right to expect Catholic philosophers and scientists to enter the arena in defence of human dignity, because they know from revelation and the perennial philosophy that man's soul is spiritual, made to the image and likeness of God. We also expect Catholic philosophers and scientists to make positive contributions to science and its theoretical foundations. In other words, we expect Catholic philosophers and scientists to appreciate the true dignity of scientific knowledge and research—not because they might be more gifted, but because they have the advantage of the true faith and the resources of a *philosophia perennis*. This does not mean that Catholics are in a position to judge scientific details *a priori*, or without careful study. Scientific research and analysis are laborious occupations for everyone, Catholic and non-Catholic; and progress in scientific knowledge is a result of cooperative effort, utilizing every means at one's disposal. Nevertheless, Catholics start out with the assurance that the truths revealed by God are absolutely certain and that no truth discoverable by science can contradict them. These revealed truths include both supernatural realities beyond the scope of reason and certain natural realities within the competence of reason and science, such as the existence of God and the immortality of the human soul. Further, the Catholic starts with the assurance that all truth is from God and can lead back to Him if the whole pattern of reality is considered. Finally, the Catholic has at his disposal a font of ancient wisdom which Leo XIII called the *philosophia perennis*. This perennial philosophy, of course, is not a matter of divine revelation; nor does it pretend to contain all the answers. But it does propose true answers to some of the more basic questions of science and human life, answers which can be evaluated by natural reason, and which can be accepted as a starting point for further serious investiga-

tion. Even the method whereby fruitful investigation can be continued today is to be found in the perennial philosophy of the ancients. Only an unreasonable or prejudiced thinker would dismiss this wisdom of the ancients without fair study. An ancient truth does not cease to be true just because it is ancient. Nor does the perennial philosophy cease to be philosophy just because someone else thought of it first.

When Leo XIII called for the restoration of the *philosophia perennis* in Catholic schools, he explicitly desired this to be the light by which modern problems of natural science, social ethics and metaphysics are to be worked out. "Even physics, the study which is now held in such high esteem, and which by its many wonderful discoveries has secured to itself everywhere special admiration, will not only receive no detriment but a powerful help from the restoration of the ancient philosophy." Leo XIII pointed out that the consideration of facts and the observation of nature are alone not sufficient for the fruitful appreciation and advancement of natural science. One needs discussion of more fundamental questions of science, reflection on the data obtained, synthesis of various aspects, analysis of scientific theory itself and epistemological evaluation in the light of human knowledge as a whole. "To these investigations it is wonderful what light and powerful aid is afforded by scholastic philosophy, if it be wisely handled." The examples of St. Thomas Aquinas and Blessed Albertus Magnus were proposed to modern investigators of nature by Pope Leo. Over half a century later Pope Pius XII gave modern scientists St. Albert the Great for their heavenly patron, "in order that students of the natural sciences, bearing in mind that he had been given them as their guide, might follow in his footsteps and not cling too tightly to the investigation of the fragile things of this life, nor forget that their souls are meant for immortality, but use created things as rungs in a ladder that will elevate them to understand heavenly things and take supreme delight in them."

Leo XIII had ordered the restoration of scholastic philoso-

phy, particularly that of St. Thomas Aquinas, in all centers of Catholic learning—seminaries, colleges, institutes and universities—that Catholic intellectuals might contribute to the solution of modern problems. The carrying out of this directive was a difficult task. There are some observers today who claim, with considerable justification, that the Leonine directive has never been carried out fully even to this day. However, there were special difficulties in the 1880's. Scholastic philosophy was a philosophy, and 'philosophy' since the time of Leibniz and Wolff meant metaphysics and ethics. Metaphysics, for Wolff and his innumerable disciples, was divided into general ontology and special ontology, embracing cosmology, psychology and theodicy. Consequently some Catholics fancied that Thomistic philosophy had to be truncated to fit the Procrustean bed of Wolffian metaphysics. Furthermore, the acquisition of scientific knowledge is a difficult task, requiring special training and devotion. Professional philosophers in seminaries and universities could hardly be expected to acquire detailed knowledge of highly developed sciences. Consequently it seemed more expedient to let science alone and concentrate on a metaphysical type of cosmology and rational psychology.

The first university to attempt to fulfill the wishes of Leo XIII was the Catholic University of Louvain. In a papal brief of December 25, 1880, the bishops of Belgium were directed to establish a chair of Thomistic philosophy. By July, 1882, arrangements had been made with the University, and Canon Désiré Mercier, professor of philosophy at the Seminary of Malines, was appointed to the chair. To prepare himself for this new and unique post, Dr. Mercier (with beard and without clerical garb) undertook formal training in psychology under the famous Charcot in Paris. At Louvain he followed the formal courses and laboratory work in physiology, neurology, chemistry, mathematics and linguistics. He was convinced that no domain of modern science can be considered foreign to Thomistic philosophy. In 1888 Msgr. Mercier founded, with the enthusiastic approval of the pontiff, the *Institut Supérieur*

de Philosophie, or Ecole saint Thomas d'Aquin. Outlining the program of the *Institut*, Msgr. Mercier said, "The science of today is above all a science of the most exact individual research. . . . Let us train, in greater numbers, men who will devote themselves to science for itself, without any aim that is professional or directly apologetic, men who will work at first hand in fashioning the materials for the edifice of science." The new *Institut* was to be a center of study and research where work would be done on "science in the making." Msgr. Mercier accepted the tripartite division of speculative knowledge explained by St. Thomas: natural philosophy, mathematics and metaphysics. Natural philosophy and experimental science constituted a unified discipline of mind, quite distinct from metaphysics. But, as Mercier expressed it, Thomistic natural philosophy seeks 'ultimate' causes (*propter quid*), while experimental science seeks 'proximate' causes (*quia*). Mercier's distinction, which was accepted by his distinguished associates, Michotte and Nys, is still found in many modern manuals of scholastic philosophy.

The influence of Mercier was very great, both at Louvain and elsewhere. The example of Louvain was soon followed by the Catholic institutes and universities of Munich, Milan, Paris, Cologne, Münster, Fribourg, Nijmegen, the "Gregorian," the "Angelicum" and the Catholic University of America.

After the death of Cardinal Mercier in 1926, a number of Louvain professors under the inspiration of Fernand Renoirte have come to see a sharp distinction between the non-causal explanations of modern science and the causal explanations of Thomistic philosophy. For them St. Thomas' natural philosophy seems to be of the metaphysical order and different from the technique of modern science. In effect, this was a return to the Wolffian conception of philosophy, although today it is presented as the authentic teaching of St. Thomas. Alumni of Louvain have made this view widely known in the Netherlands and in the United States. According to this view the philosophy of nature is a metaphysical study, differing essentially from the

experimental sciences, because it reaches "a level of thought in which no sense-perceptible element is retained and therefore no verification by the senses is possible." In "support" of this view, proponents invariably quote, out of context, a passage from St. Thomas' *In Boethium De trinitate*, q. 5, a. 1 ad 6. However, apart from the impossibility of justifying this view in the writings of St. Thomas, St. Albert or any of the schoolmen, it seems to be unsatisfactory for many reasons. It is based on what seems to be a misconception of metaphysics; it apparently ignores the genesis of analogical concepts; and it widens the chasm between philosophy and science, returning to the insoluble situation of Wolffian Idealism. It denies the dignity of natural science by giving it too little intellectual content, and it denies the dignity of natural philosophy by rarefying it beyond sense contact. There is no doubt that the physical universe can be studied 'metaphysically,' but only at the expense of those very details of interest to the natural philosopher. The universe which interests the natural philosopher is full-blooded, and quite un-metaphysical.

A more realistic approach to the relation of philosophy to science was made by Jacques Maritain in his monumental *Distinguer pour Unir: ou Les Degrés du Savoir* (1932) and in his detailed *La Philosophie de la Nature* of 1935. This distinguished Thomist learned contemporary philosophy from Henri Bergson and biology from Hans Driesch before finding his home in Thomism. First, Maritain accepts the traditional division of speculative philosophy into natural philosophy, mathematics and metaphysics. Second, he realizes that the experimental sciences have developed greatly since the time of Aristotle and St. Thomas Aquinas. Third, he examines modern 'science' and sees that it is not a homogeneous whole; in fact, it includes two specifically different types of knowledge. One type is formally mathematical, even though empirical. This type Maritain calls *empiriométrique*, because it is concerned solely with the measurable aspect of empirical observation. This concern is characteristic of all parts of modern physics

and a great part of modern chemistry. However, for Maritain, this type of knowledge was familiar to Aristotle and St. Thomas as *scientiae mediae* between pure mathematics and natural philosophy. The second type of knowledge found in modern science is essentially empirical, descriptive of phenomena, 'perinoetic' and somewhat hypothetical in character. This type Maritain calls *empirioschématique*, because it is concerned solely with ordering empirical observation by means of non-mathematical constructs. This concern is characteristic of such experimental sciences as biology, botany, anthropology, physiology, neurology and psychology. Finally, Maritain comes to reconciling his analysis of modern science with the traditional division of speculative knowledge. The empiriometric sciences present no difficulty, since they are *scientiae mediae* between mathematics and the first degree of abstraction. The empirioschematic sciences, however, present a problem. They do not attain the essential natures of material things; they are rather descriptive, hypothetical and superficial (perinoetic). Aristotle's natural philosophy, on the other hand, intuitively attains the essential, ontological natures of changeable being; it is 'dianoetic,' profound and certain. Therefore Maritain suggests that Aristotelian natural philosophy and modern empirioschematic science belong to two different levels of intelligibility within the traditional first degree of abstraction, the former resolving its definitions to 'being,' the latter to sense and 'mobility.' The view of Jacques Maritain, therefore, is similar to that of Cardinal Mercier, except that Maritain alone accounts for the unique position of physics in modern science.

There is no denying the acumen of M. Maritain's analysis and the astuteness of his solution. There is only one difficulty: if the empirioschematic sciences are as superficial and hypothetical as Maritain believes, then they are not sciences at all, but only dialectical preparations for science. Scientific knowledge, as understood by Aristotle and St. Thomas, consists in true demonstration, that is, a causal explanation of essential properties. But this is impossible without dianoetic knowledge

of essential natures. In other words, without knowledge of the essential nature of the subject and the property, there can be no demonstration; there can be no scientific knowledge properly so called. The anomaly of M. Maritain's position is that he reconciles modern empirioschematic science with Thomistic philosophy of nature by depreciating modern science. Undoubtedly there are many areas of modern 'science' which are superficially descriptive, tentative and dialectical in content. If, on the other hand, there are areas of modern science which truly attain essential natures and through them demonstrate characteristic attributes, as often seems to be the case in the biological sciences, then the situation is very different from that presented by M. Maritain.

A better solution was recognized by Fr. Aniceto Fernandez-Alonso, O. P. In 1936 he published a remarkable paper entitled "Scientiae et Philosophia secundum S. Albertum Magnum." Examining the scholastic scene of the 1930's, Fr. Fernandez saw that all scholastics wished to recognize a real distinction between modern science and Aristotelian philosophy. This distinction was variously described as one of content (accidental relations vs. substantial essences, phenomena vs. noumena, sensible vs. intelligible) or one of method (inductive vs. deductive, proximate causes vs. ultimate causes, *quia* demonstrations vs. *propter quid* demonstrations). Fr. Fernandez then went on to show that none of these can differentiate the speculative sciences, for every science, whether it be called empirical or philosophical, must deal with substance and accidents, must be intelligible and sensible; further, every science must be inductive and deductive, must demonstrate through immediate (*propter quid*) and remote (*quia*) causes. Fr. Fernandez's own view can be summarized briefly in three propositions, each of which he proves at great length. (1) All modern science and all natural philosophy are specifically distinct from metaphysics. (2) All sciences formally illuminated by mathematical principles are specifically distinct from sciences of nature, although materially they all study the same physical universe. (3) Aris-

totelian natural philosophy and the so-called empirical, or experimental sciences constitute one specific discipline, both materially and formally: they are two parts of one and the same science concerning *ens mobile*, and each part has need of the other. These propositions are all justifiable according to the principles of Albertus Magnus. Fr. Fernandez concludes his study by saying, "The division of human knowledge into philosophic and scientific as into two species necessarily and always distinct by the very nature of the objects and the formal independence of one from the other is an assertion which can be made in Platonic, Cartesian, Hegelian and Bergsonian philosophy, but cannot be made in Aristotelian or Albertine philosophy, nor according to the truth of the matter."

Today the view of Fr. Fernandez is defended by the Very Reverend William Humbert Kane, O. P., and the Albertus Magnus Lyceum. On reading the paper in 1936, Fr. Kane immediately recognized the merits of this view, and his own quest for a solution fell into place. Through his stimulating classes and informal discussions he developed a group of disciples and friends who were equally convinced of the importance of a unified view of Thomistic natural philosophy and modern investigations. By 1950 sufficient unified interest was shown in the study of natural philosophy and modern problems to warrant suggesting a special institute directed by Fr. Kane for serious work in this area. The idea of such an institute was, indeed, unique in the Dominican Order; on the other hand, nowhere in the Order were there so many men convinced of the importance of Thomistic natural philosophy for the solution of modern problems. The idea of an institute devoted to special research was also unique among Dominicans in the United States; on the other hand, the time was ripe for such a venture in this country. Consequently the idea was formally presented to the Provincial of the Dominican Province of St. Albert the Great, the Very Reverend Edward L. Hughes, O. P., by the Regent of Studies and President of the Pontifical Faculty of Philosophy at River Forest, Illinois, the Very Rev-

erend Sebastian E. Carlson. By special decree of the Provincial, the Albertus Magnus Lyceum was established at River Forest in 1951, its official date of inception being celebrated on November 15, the feast of St. Albert.

On this tenth anniversary of its establishment the Lyceum takes great pleasure in presenting this volume of studies to its founder and former director on his sixtieth birthday. The volume reflects the wide interest of its members and friends. From small beginnings the Lyceum has grown to include Dominicans of other Provinces and many non-Dominicans. It has developed a serious interest in scientific methodology, the history and philosophy of science, various technical problems of physics, biology, evolution and psychology; and it has had a decided influence on the teaching of natural science in the schools. Of course, much remains to be done in these vast areas of natural science and more specialists are needed even now. Here one can apply the phrase of St. Thomas: *Fiat aliquid per plura, quod non potest fieri per unum.*

The Lyceum's view of natural philosophy and the modern sciences has been presented in innumerable writings, lectures, symposia and discussions. Nevertheless, its view has been frequently misunderstood and misrepresented by those who, presumably, disagree with its position. Presumably they have read at least some of the writings which they attack. But it is unreasonable to expect fruitful discussion and disagreement without mutual understanding. By far the most commonly misunderstood point is the Lyceum's (and Maritain's) distinction of modern sciences. Neither Maritain nor the Lyceum considers 'modern science' to be a single, homogeneous body of knowledge. They make a careful distinction between those sciences which are formerly mathematical and those which are not. Formally mathematical sciences (*empiriométrique, scientiae mediae*, mathematical-physical sciences) are acknowledged to be really distinct from the philosophy and science of *nature*. Although extrinsic, the mathematical-physical sciences are of utmost importance to the naturalist in the examination of prob-

lems and in the quest for proper solutions, demonstrative or tentative. Conversely, the natural sciences are of importance to the mathematical physicist in giving him the extrinsic foundation for his own science. Further, the Lyceum considers the non-mathematical parts of modern science to belong to a single science concerning *ens mobile ut mobile*. In practice, courses in natural philosophy rarely get beyond general considerations, and courses in experimental science rarely get beyond particular considerations and experiments. However, the Lyceum considers that in both the general and particular parts of this unique discipline there are to be found diverse types of certainty: demonstrative, most probable, tentative, hypothetical, factual and even historical. Finally, the Lyceum maintains that the single science of nature is autonomous in its own field, and in the order of learning prior to and independent of metaphysics.

There are many advantages to this view. First, it recognizes the dignity of a scientific study of the natural world which includes man, animals, plants and inanimate realities. Second, it recognizes the importance of this science for moral, metaphysical and theological concepts. Third, it offers a real possibility of cooperation between the professional philosopher and the experimental scientist. Fourth, it is consistent with the teaching of St. Thomas and St. Albert, for whom natural science is incomplete unless after studying the general theory found in the *Physics*, one proceeds to more and more particular species and varieties of living and non-living natures. Fifth, it is consistent with the actual practice of modern scientists, who begin with very particular varieties and gradually ascend to a more embracing unity, usually in old age. Here the statement of Heraclitus would be applicable: "The way up and the way down is one and the same."

III

It is not very often that an institution can celebrate its own anniversary and that of its founder at the same time. Hence it is a privilege for the Lyceum to celebrate its tenth anniversary by presenting these special studies to Fr. William

Humbert Kane on his sixtieth birthday, July 12, 1961. His inspiring devotion to study, to teaching and to the Dominican way of life deserve some recognition from his brethren and friends besides the normal courtesies of academic and religious life. This *Festschrift* is presented to him with warm affection, deep respect and eternal gratitude. It is a token, indeed a very small token, of our great esteem. Those who esteem Fr. Kane's life-long work recognize his influence on the intellectual life in the United States, both within and without the Dominican Order. Those who have not had the privilege of knowing him will find in this volume the fruits of much of his labor.

William (Dean) Kane was born in La Grange, a suburb of Chicago, on July 12, 1901. After completing Lyons Township High School and attending Aquinas College in Columbus, he entered the Order of Preachers in Somerset, Ohio, in 1920, and took the religious name of Humbert. After the normal course of studies he was ordained to the priesthood in Washington on June 9, 1927. But while he was studying theology at the Dominican House of Studies in Washington, he studied pre-medicine at the Catholic University of America (1923-26) and medicine at Georgetown University School of Medicine (1926-28) in preparation for the Chinese missions. Successfully completing his Lectorate dissertation, "The Criterion of Philosophical Truth," in 1928, he was sent to the Collegio Angelico in Rome for two years graduate study in philosophy. His examination and dissertation on "Finality in Nature" obtained for him the Doctorate of Philosophy *summa cum laude* in June of 1930. His life thereafter was completely devoted to teaching, and it is for this that he is best known. In thirty years of teaching—biology, logic, natural philosophy, metaphysics and theology—he has given much serious thought to the text of St. Thomas and to modern problems. From 1933 until 1940 Fr. Kane was *Lector Primarius* in the House of Philosophy at River Forest, and from 1940 until 1948 he was Pro-Regent of Studies for the newly created Province of St. Albert the Great. On December 17, 1944, the River Forest *studium* was established

as a Pontifical Faculty of Philosophy, and Fr. Kane became its first President. On that day, too, he received the ring and biretta of a Master in Sacred Theology, a degree which he had rightfully earned through his teaching. Returning to Rome as Professor of Natural Philosophy in 1948, he created such an impression on the students that he was thought to be more European than American in his devotion to study. In 1951 when the Albertus Magnus Lyceum was established, he returned to the United States to be its director. The bulk of his writings date from this return to River Forest. Now at sixty, the Very Rev. William Humbert Kane feels that his work is just beginning, but he has the assurance that his ideals have taken root in the minds and hearts of his disciples. We extend to him our gratitude, prayers and best wishes AD MULTOS ANNOS.

For the preparation of this volume special gratitude is due not only to the eminent contributors, who enthusiastically endorsed the project from the start, but also to those members of the Albertus Magnus Lyceum who are not represented here. Particular acknowledgement must be made to the President, the Very Rev. Sebastian E. Carlson, and to the Secretary of the Lyceum, the Rev. William B. Mahoney, whose tireless efforts supported the whole project. The Lyceum gratefully acknowledges the encouragement and contribution of the Master General of the Order of Preachers, the Most Rev. Michael Browne, and his Socius for the North American Provinces, the Very Rev. John A. Driscoll. Our sincere gratitude is offered to the Very Reverend John E. Marr, O. P., Provincial of the Province of St. Albert, who has given his encouragement and support to this volume. Since the effort has reached beyond provincial boundaries, we extend this same gratitude to the Very Reverend W. D. Marrin, O. P., Provincial of the Province of St. Joseph. Above all, we are grateful to The Thomist Press and the editorial staff of The Thomist who have joined with the Albertus Magnus Lyceum in honoring our Father William Humbert Kane, O. P., S. T. M.

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