A PATRON FOR SCIENCE

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IF that profession which we call Science were sufficiently mediaeval minded to seek anything like a patron, it would find no one better qualified than Albert the Great whose cause for canonization will quite probably very soon be before the world. Not only is this servant of God qualified to represent our scientists in the courts of Heaven, but a study of his life will offer most convincing reasons why science should be sufficiently mediaeval minded to go seeking a patron.

Blessed Albertus Magnus is peculiarly a modern, in spite of the fact that he has been dead for more than six hundred years. Of all the many-sided geniuses who have lived throughout the ages, he is the only one whose learning alone has brought the title "Great." Those who know him as a philosopher or a theologian, know but a small part of the man, and the very science for which he is famed is but a small part of the foundation of his structure of knowledge. He wrote about astronomy, biology, mathematics, architecture, medicine, music, horse raising, falcon raising, etc. In fact, to enumerate the fields of learning which he explored and to indicate the exhaustiveness of those explorations by mentioning some of the details he touched upon would give us a list so long and so filled with anti-climaxes that it is better to simply recall his title among the savants of his day— *Doctor Universalissimus.*

In the richly deserved acknowledgment of St. Thomas Aquinas as the master thinker of the golden age of Universities, who has perhaps never been equalled before or since, Albert the Great, his old teacher, suffers the fate of those who knew great men. He lives in the minds of many who know something of him, as a figure somewhere in the background, reflecting some of the dazzling splendor of the Angelic Doctor. But a study of their lives and works shows that the difference between them is rather one of kind than of degree. Thomas is the synthesist without par. Whatever comes to his mind immediately finds its place in the general scheme of things, so that we imag-

ine him in his dictation ruthlessly brushing aside whatever vagrant thoughts were at all beside the point. Albert on the other hand is the scientific analyst who had, it seems, an urge to tear whatever he came upon into its most minute particles that he might further inspect them. His commentaries on the physics of Aristotle are divided into sections headed *Digressio* and many are the times when his wanderings are true digressions in the English sense of the word. Not that Albert lost his place in reading the book of the universe; rather, he loved to linger over the words, while Thomas digested paragraphs and pages at a glance.

Although it is not done with the intention of belittling, one often hears that the thirteenth century was an age of theology —consider Thomas Aquinas and Bonaventure; or an age of scientific study—consider Michael Scot and Roger Bacon; or an age of this or that. But there can be no age, since time was, which can be called an age of everything, with one man looked upon as the highest authority in practically every branch. Albert was more—far more—than a product of his time.

His life almost spans that thirteenth century. According to most authorities[1] he was born in 1193 in Lauingen on the Upper Danube and died in 1280, living more than eighty-five years. Whether this be the correct date of his birth or whether it took place in 1205 as Jammy and others hold,[2] all are agreed that he entered the Order of Preachers in 1223 receiving the habit from Blessed Jordan of Saxony. He was twice Provincial of the German Province of his Order. He became Bishop of Ratisbon but soon after he resigned to return to his cell. The greater part of his life however was spent in the professor's chair in Paris, Ratisbon, Cologne, and other universities.

These institutions, since they were young and had no traditions to maintain, could afford to be daring and a bit original, and the young German professor was not satisfied with Latin texts in use for the physical sciences. It is a modern perversion to base one's higher studies on the psychology of this or that, or a highly specialized branch of science, and to get a cultural finish by taking a course in English literature. It was a mediaeval notion to gather from observation and experiment a basis

[1] Rudolphus de Novimagio, *Legenda Beati Alberti Magni* (New edition, 1929, Coloniae Agrippinae) pars 1a, cap. 1o, p. 8; Vide preface of Bourgnet, Vives edition, *Opera Omnia*, Vol. I, pp. x, xi, xii.

[2] For discussion see Vives edition, Vol. I, Note 1, xiii.

of natural philosophy, on which to place a system of ontology, natural theology, and ethics, and to crown the edifice with the truths of Revelation.

So Albert looked to Aristotle as his most satisfactory guide in the realm of nature and went about explaining the Philosopher to those who sought his aid. His introduction well explains his purpose. "It is our intention," he says, "to satisfy those brothers of our Order who have sought our aid; so we have written this book from the experiences of many years in which a full course of natural science may be found, and through which the works of Aristotle may be understood. . . . This work is first done for the honor of the Omnipotent God Who is the Font of Wisdom, and the Creator, Institutor, and Governor of Nature; then for the use of our brothers and all those who desire to learn of natural science in these pages. We have added here and there unfinished parts of books, and have inserted or omitted those things which in the first case Aristotle did not write, and in the second, which he wrote, but which do not pertain to us, because there are three essential parts of philosophy — physics, metaphysics, and mathematics, and our principal intention is to make these parts intelligible. . . ."

It is impossible to enter into a detailed discussion of his treatises in the realm of science but it is enlightening to read a list of subjects treated. Here are some of the titles:

On the heavens and the earth,
On the causes of the properties of elements,
On generation and corruption,
On the science of meteors,
On nourishment and things nourished,
On sleeping and waking,
On sense and sensation,
On respiration and inspiration,
On the intellect and the intelligible,
On youth and old age,
On death and life,
On vegetables and plants.

He is not however so remarkable for his method of studies as for the extent of his observations and the ingeniousness of his experiments. Lynn Thorndike in his *History of Magic and Experimental Science*[3] has gathered a few of Albert's biological

[3] Vol. II, Chap. lix, p. 541.

experiments in the following paragraph: "He (Albert) proved that the cicada goes on singing in its breast for a long time after its head has been cut off. He also proved to his satisfaction that a turtle though a marine animal will not drink sea water unless possibly fresh water which has flowed into the sea, by experimenting with a turtle in a vessel of water. He has heard it said that the ostrich eats and digests iron, but the many ostriches to whom he has offered the metal have consistently declined it, although they would devour with avidity stones and bones cut into small bits."[4] These are not as pretentious as the laboratory tests of our own day; they are experiments none the less, and represent the same painstaking labor which is accomplishing so much today.

The mathematical works of Albert include arithmetic, music, geometry, the science of perspective, a book of the stars, a treatise on the science of alchemy about which one of his earliest biographers, Rudolph de Novimagio, hastens to assure us that "he showed the fallacies of the alchemists and many of their errors, proving that nearly all of them were fakirs." The same writer goes on, "The venerable Albert wrote a Mirror of Astronomy in which he condemns such magical science as necromancy . . . geomancy, hydromancy, pyromancy, aeromancy, chiromancy, auguries, the horoscope . . . and distinguishes between licit and illicit astronomy."[5]

In spite of his open disavowal of the shadow-region arts, which we summarize nowadays under the name of magic, this devout God-fearing man has ever had his name mixed up in the black art in the minds of the peasants, to such an extent that in parts of Germany for centuries after his death, it was called the Albertine Science.[6] And the explanation is not hard to find if we remember that Albert with his laboratory and his many interests was somewhat ahead of his time. Then, too, there was no Sunday supplement through which he might acquaint the people with the relatively simple explanations which lay at the bottom of the strange things he produced.

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[4] References to these experiments in the *Opera Omnia* are: XXVI, 1, 10; XXIV, 123; XXIII, 1, 104.

[5] *op. cit.*, pars secunda, cap, xiii, p. 66.

[6] Our age is not so far advanced for in this century and in this country one of the most absurd books imaginable was published containing hundreds of potions and mixtures to ward off certain diseases and misfortunes, as well as a number of prayers or more properly incantations to be mumbled in accompaniment.

Dr. Joachim Sighart whose biography of Albert[7] is comparatively recent has gathered many curious tales of uncanny accomplishments of this friar which have persisted in Germany, with we know not how many embellishments, and this author has tried to sift the germ of truth underlying them from what is manifestly impossible.

One is to the effect that when King William of Holland was passing through Cologne he paid Albert a visit, and to surprise his royal guest, the learned man brought him out into the convent grounds on a cold, bleak January day. The spot was immediately transformed into a tropical garden with trees and flowers, the like of which the court had never seen. In that story Albert comes down to us as a wand waver. There is no doubt as to William's visit at that time, but it is more than likely that the mystery lies in the fact that the friars had a well equipped greenhouse under Albert's supervision—and a greenhouse was a rarity in Europe at the time.

Another legend with its setting in Cologne tells us that one day Thomas Aquinas as a young student ventured into the mysterious and dreaded laboratory of his master. He felt himself irresistibly drawn to a certain corner and drawing aside a curtain he came face to face with a young girl who said, *Salve, Salve, Salve.* Believing it to be the devil, he struck at the figure with a stick and the statue broke to pieces. As the frightened youth was flying from the room he met Albert who said, "Thomas, you have destroyed in an instant the labor of thirty years." The story is perhaps partly founded on the well known incident in the life of St. Thomas when he was girded by angels. However, Albert speaks of automatons which were able to move by means of tiny wheels partly filled with mercury. He also speaks of steam devices which were often made in the shape of men and which seemed to utter sibilant sounds. That he perfected mannikins of this nature is highly probable; that Thomas Aquinas would smash one up in fright is just as highly improbable.

Then there is the magic cup which could cure all diseases. It was simply a cup with a double bottom, the upper layer of which was perforated and antimony placed between the two. When water was poured in, the antimony dissolved and the

[7] Albertus Magnus: *sein Leben und sein Wissenschraft,* (Ratisbon, 1857); French translation, Paris, 1862; English translation by Dixon, London, 1876. Out of Print.

beverage had a purgative effect, whereas when wine was used the solution was more active and produced vomiting. So to all appearances, Albert had but to pour in to his cup whatever was nearest at hand and produce his desired effect. These tales are but a few of the many which Dr. Sighart has collected and the fact that they have persisted so long through the centuries is a token of the esteem in which the learning of the friar was held, for legendary fancy embellishes rather than creates.

It is hard to reconcile the magic, which many of the simple country folk of Albert's home attribute to him, with his ardent devotion to the Mother of God. The Breviary in the lessons for his feast, contains a legend, not in line with those quoted above, and although the fact is not found in his early biographies, it is probably not without some foundation. The story is that as a youth he had difficulty in some of his studies and was despairing of ever accomplishing much in intellectual lines when the Blessed Virgin appeared to him and told him to have courage and all would be well. She warned him however that before he died his knowledge would be all taken from him. Many years after when Albert, now an old man, was preaching in Cologne, his mind suddenly went blank and he was unable to go on. Realizing what had happened he later told the story of his earlier vision and its fulfillment. It is certainly true that a few years before he died, this old man, broken by vigils and fasts and taxed by overwork, found his memory gone, and knew not the explanation of the very things which he had discovered or invented. His infirmity, instead of being a source of irritation, offered him an example by which he could demonstrate the gratuitousness of knowledge as a gift of God. The man who wrote so reverently of theology as did he, and who composed such a work as his *Mariology*, lived in an atmosphere which was not healthy for devils, and if the saintly Albert was so learned that his neighbors thought of him as Albert the Magician, the fault really lies with his neighbors.

To get back to our original proposition, why should this man be the patron of modern scientists? Because from all indications, the science of tomorrow will be sane enough to be worthy of its mediaeval proponent. That illusive, intangible, something called "Science" is suddenly manifesting marked symptoms of improvement, and the brightest of these is a conservatism and a distrust of its own omnipotence. Victorian science threw out God for atoms which it complacently said were

like little billiard balls. The learned men of the succeeding century juggled and cued those balls until they knocked them into protons and electrons which no longer looked like billiard balls but rather like planetary systems. These became explicable only in terms of force or energy or motion which most of these learned men believed to be something extrinsic. Of course, for the most part, these learned men did not call this Extrinsic Something, God. Science, we said, was on the mend; it is not yet in full health. But no matter what verbiage clouds the scientists' conclusions, the close observer always feels that they conclude nothing, that their most cogent arguments end in a series of dots, and that series is the same infinite one at which Thomas of Aquin and Albert of Cologne shook their heads and called impossible seven hundred years ago. These mediaeval friars said there must be an end, or, in the ontological order, a beginning,—there must be a first mover Who is Himself unmoved, and, this First Mover, we call God.

Is it paradoxical that the Victorian scientist, who knew nothing great but man, should pass unsung, while Albert, who knew nothing great but God, should be called *great* down through the ages? Hardly, because the latter went into every branch of human learning and attained an overview while the former stared at one detail until his eyes bulged so that all perspective was lost. Albert knew just enough to be sure that the human mind does not know and human skill cannot do everything; modern science is slowly and painfully rediscovering the fact which was lost in a rationalistic reaction to the Reformation. Modern science with intellectual subtley ventures into speculation from time to time and hints at a Supreme Being; Albert, with the naive consistency which belonged to the Middle Ages, saw the places of man and God in the universe and built his life accordingly so that now he bids fair to be called Saint. The secret of Albert's greatness, even as a scientist—and this is an age when men pay high for secrets of success—was simply that he firmly believed in "God, the Father Almighty, Creator of heaven and earth, and in Jesus Christ, His only Son. . . ."