Dedication of the Revolutions of the Heavenly Bodies to Pope Paul III

Nicolaus Copernicus (1543)

I CAN easily conceive, most Holy Father, that as soon as some people learn that in this book which I have written concerning the revolutions of the heavenly bodies, I ascribe certain motions to the Earth, they will cry out at once that I and my theory should be rejected. For I am not so much in love with my conclusions as not to weigh what others will think about them, and although I know that the meditations of a philosopher are far removed from the judgment of the laity, because his endeavor is to seek out the truth in all things, so far as this is permitted by God to the human reason, I still believe that one must avoid theories altogether foreign to orthodoxy. Accordingly, when I considered in my own mind how absurd a performance it must seem to those who know that the judgment of many centuries has approved the view that the Earth remains fixed as center in the midst of the heavens, if I should, on the contrary, assert that the Earth moves; I was for a long time at a loss to know whether I should publish the commentaries which I have written in proof of its motion, or whether it were not better to follow the example of the Pythagoreans and of some others, who were accustomed to transmit the secrets of Philosophy not in writing but orally, and only to their relatives and friends, as the letter from Lysis to Hipparchus bears witness. They did this, it seems to me, not as some think, because of a certain selfish reluctance to give their views to the world, but in order that the noblest truths, worked out by the careful study of great men, should not be despised by those who are vexed at the idea of taking great pains with any forms of literature except such as would be profitable, or by those who, if they are driven to the study of Philosophy for its own sake by the admonitions and the example of others, nevertheless, on account of their stupidity, hold a place among philosophers similar to that of drones among bees. Therefore, when I considered this carefully, the contempt which I had to fear because of the novelty and apparent absurdity of my view, nearly induced me to abandon utterly the work I had begun.

2 My friends, however, in spite of long delay and even resistance on my part, withheld me from this decision. First among these was Nicolaus Schonberg, Cardinal of Capua, distinguished in all branches of learning. Next to him comes my very dear friend, Tidemann Giese, Bishop of Culm, a most earnest student, as he is, of sacred and, indeed, of all good learning. The latter has often urged me, at times even spurring me on with reproaches, to publish and at last bring to the light the book which had lain in my study not nine years merely, but already going on four times nine. Not a few other very eminent and scholarly men made the same request, urging that I should no longer through fear refuse to give out my work for the common benefit of students of Mathematics. They said I should find that the more absurd most men now thought this theory of mine concerning the motion of the Earth, the more admiration and gratitude it would command after they saw in the publication of my commentaries the mist of absurdity cleared away by most transparent proofs. So, influenced by these advisors and this hope, I have at length allowed my friends to publish the work, as they had long besought me to do.

3 But perhaps Your Holiness will not so much wonder that I have ventured to publish these studies of mine, after having taken such pains in elaborating them that I have not

hesitated to commit to writing my views of the motion of the Earth, as you will be curious to hear how it occurred to me to venture, contrary to the accepted view of mathematicians, and well-nigh contrary to common sense, to form a conception of any terrestrial motion whatsoever. Therefore I would not have it unknown to Your Holiness, that the only thing which induced me to look for another way of reckoning the movements of the heavenly bodies was that I knew that mathematicians by no means agree in their investigations thereof. For, in the first place, they are so much in doubt concerning the motion of the sun and the moon, that they can not even demonstrate and prove by observation the constant length of a complete year; and in the second place, in determining the motions both of these and of the five other planets, they fail to employ consistently one set of first principles and hypotheses, but use methods of proof based only upon the apparent revolutions and motions. For some employ concentric circles only; others, eccentric circles and epicycles; and even by these means they do not completely attain the desired end. For, although those who have depended upon concentric circles have shown that certain diverse motions can be deduced from these, yet they have not succeeded thereby in laying down any sure principle, corresponding indisputably to the phenomena. These, on the other hand, who have devised systems of eccentric circles, although they seem in great part to have solved the apparent movements by calculations which by these eccentrics are made to fit, have nevertheless introduced many things which seem to contradict the first principles of the uniformity of motion. Nor have they been able to discover or calculate from these the main point, which is the shape of the world and the fixed symmetry of its parts; but their procedure has been as if someone were to collect hands, feet, a head, and other members from various places, all very fine in themselves, but not proportionate to one body, and no single one corresponding in its turn to the others, so that a monster rather than a man would be formed from them. Thus in their process of demonstration which they term a "method," they are found to have omitted something essential, or to have included something foreign and not pertaining to the matter in hand. This certainly would never have happened to them if they had followed fixed principles; for if the hypotheses they assumed were not false, all that resulted therefrom would be verified indubitably. Those things which I am saying now may be obscure, yet they will be made clearer in their proper place.

4 Therefore, having turned over in my mind for a long time this uncertainty of the traditional mathematical methods of calculating the motions of the celestial bodies, I began to grow disgusted that no more consistent scheme of the movements of the mechanism of the universe, set up for our benefit by that best and most law abiding Architect of all things, was agreed upon by philosophers who otherwise investigate so carefully the most minute details of this world. Wherefore I undertook the task of rereading the books of all the philosophers I could get access to, to see whether any one ever was of the opinion that the motions of the celestial bodies were other than those postulated by the men who taught mathematics in the schools. and I found first, indeed, in Cicero, that Niceta perceived that the Earth moved; and afterward in Plutarch I found that some others were of this opinion, whose words I have seen fit to quote here, that they may be accessible to all:—

5 "Some maintain that the Earth is stationary, but Philolaus the Pythagorean says that it revolves in a circle about the fire of the ecliptic, like the sun and moon. Heraklides of

Pontus and Ekphantus the Pythagorean make the Earth move, not changing its position, however, confined in its falling and rising around its own center in the manner of a wheel."

6 Taking this as a starting point, I began to consider the mobility of the Earth; and although the idea seemed absurd, yet because I knew that the liberty had been granted to others before me to postulate all sorts of little circles for explaining the phenomena of the stars, I thought I also might easily be permitted to try whether by postulating some motion of the Earth, more reliable conclusions could be reached regarding the revolution of the heavenly bodies, than those of my predecessors.

7 And so, after postulating movements, which, farther on in the book, I ascribe to the Earth, I have found by many and long observations that if the movements of the other planets are assumed for the circular motion of the Earth and are substituted for the revolution of each star, not only do their phenomena follow logically therefrom, but the relative positions and magnitudes both of the stars and all their orbits, and of the heavens themselves, become so closely related that in none of its parts can anything be changed without causing confusion in the other parts and in the whole universe. Therefore, in the course of the work I have followed this plan: I describe in the first book all the positions of the orbits together with the movements which I ascribe to the Earth, in order that this book might contain, as it were, the general scheme of the universe. Thereafter in the remaining books, I set forth the motions of the other stars and of all their orbits together with the movement of the Earth, in order that one may see from this to what extent the movements and appearances of the other stars and their orbits can be saved, if they are transferred to the movement of the Earth. Nor do I doubt that ingenious and learned mathematicians will sustain me, if they are willing to recognize and weigh, not superficially, but with that thoroughness which Philosophy demands above all things, those matters which have been adduced by me in this work to demonstrate these theories. In order, however, that both the learned and the unlearned equally may see that I do not avoid anyone's judgment, I have preferred to dedicate these lucubrations of mine to Your Holiness rather than to any other, because, even in this remote corner of the world where I live, you are considered to be the most eminent man in dignity of rank and in love of all learning and even of mathematics, so that by your authority and judgment you can easily suppress the bites of slanderers, albeit the proverb hath it that there is no remedy for the bite of a sycophant. If perchance there shall be idle talkers, who, though they are ignorant of all mathematical sciences, nevertheless assume the right to pass judgment on these things, and if they should dare to criticise and attack this theory of mine because of some passage of Scripture which they have falsely distorted for their own purpose, I care not at all; I will even despise their judgment as foolish. For it is not unknown that Lactantius, otherwise a famous writer but a poor mathematician, speaks most childishly of the shape of the Earth when he makes fun of those who said that the Earth has the form of a sphere. It should not seem strange then to zealous students, if some such people shall ridicule us also. Mathematics are written for mathematicians, to whom, if my opinion does not deceive me, our labors will seem to contribute something to the ecclesiastical state whose chief office Your Holiness now occupies; for when not so very long ago, under Leo X, in the Lateran Council the question of revising the ecclesiastical calendar was discussed, it then remained unsettled, simply because the length of the years and months, and the

motions of the sun and moon were held to have been not yet sufficiently determined. Since that time, I have given my attention to observing these more accurately, urged on by a very distinguished man, Paul, Bishop of Fossombrone, who at that time had charge of the matter. But what I may have accomplished herein I leave to the judgment of Your Holiness in particular, and to that of all other learned mathematicians; and lest I seem to Your Holiness to promise more regarding the usefulness of the work than I can perform, I now pass to the work itself.

A Note on Copernicus and the Text:

Nicolaus Copernicus was born in 1473 at Thorn in West Prussia, of a Polish father and a German mother. He attended the university of Cracow and Bologna, lectured on astronomy and mathematics at Rome, and later studied medicine at Padua and canon law at Ferrara. He was appointed canon of the cathedral of Frauenburg, and in this town he died in 1543, having devoted the latter part of his life largely to astronomy.

The book which was introduced by this dedication laid the foundations of modern astronomy. At the time when it was written, the earth was believed by all to be the fixed centre of the universe; and although many of the arguments used by Copernicus were invalid and absurd, he was the first modern to put forth the heliocentric theory as "a better explanation." It remained for Kepler, Galileo, and Newton to establish the theory on firm grounds.

Source: This text was taken from the *Harvard Classics* volume, *Famous Prefaces*.