

Honors 210 Paper #2

“First of all I wish you to be convinced, most learned Schöner, that this man ... is in every field of knowledge and in the mastery of astronomy not inferior to Regiomontanus. I rather compare him to Ptolemy ...

“Furthermore, most learned Schöner, you see that here in the case of the moon we are liberated from an equant by the assumption of this theory, which moreover corresponds to experience and all the observations. My teacher dispenses with equants for the other planets as well ...

“The planets are each year observed as direct, stationary, retrograde, near to and remote from the earth, etc. These phenomena, besides being ascribed to the planets, can be explained, as my teacher shows, by a regular motion of the spherical earth; that is, by having the sun occupy the center of the universe, while the earth revolves instead of the sun Indeed, there is something divine in the circumstance that a sure understanding of celestial phenomena must depend on the regular and uniform motions of the terrestrial globe alone.

“Moreover, the remarkable symmetry and interconnection of the motions and spheres, as maintained by the assumption of the foregoing hypotheses, are not unworthy of God's workmanship....

“For in the common hypotheses there appeared no end to the invention of the spheres; moreover, spheres of an immensity that could be grasped by neither sense nor reason were revolved with extremely slow and extremely rapid motions Moreover, ye immortal gods, what dispute, what strife there has been until now over the position of the spheres ... and their relation to the sun.... Is there anyone who does not see that it is very difficult and even impossible ever to settle this question while the common hypotheses are accepted? For what would prevent anyone from locating even Saturn below the sun ... ?

“However, in the hypotheses of my teacher, ... the sphere of each planet advances uniformly with the motion assigned to it by nature and completes its period without being forced into any inequality by the power of a higher sphere. In addition, the larger spheres revolve more slowly, and, as is proper, those that are nearer to the sun, which may be said to be the source of motion and light, revolve more swiftly ... and each, geometrically defined, so maintains its position that if you should try to move any one at all from its place, you would thereby disrupt the entire system.”

Rheticus, in *Narratio Prima* or *First Account* (1541)

“Of all those who followed Ptolemy, Nicholas Copernicus alone deservedly stands forth.... Now, just as everyone approves the calculations of Copernicus (which are available to all through Erasmus Reinhold under the title *Prutenic Tables*), so everyone clearly abhors his hypotheses on account of the multiple motion of the earth. Here, in the present work, we shall not discuss at length the freedom of astronomers to form hypotheses, for elsewhere the matter is discussed more fully. Nevertheless, having omitted all ambiguities, we wish to say that inasmuch as we can properly approach astronomical hypotheses, and in those very hypotheses which are to be discussed here, we follow Ptolemy, in part, and Copernicus, in part. That is, if one retains the suppositions of Ptolemy, one achieves the same goal that Copernicus attained with his new constructions. And in this way, we shall demonstrate the foundations and origin of the new calculations transmitted to us since Copernicus and more accurately discussed in the *Prutenic Tables*.

“Just as in a whirlpool we say that the same anomalous motion can be explained by diverse reasons, so with Ptolemy. For he proposed an eccentric and referred its regular motion not to its own center but to another point of equality. Copernicus, however, succeeded in replacing this hypothesis, which was absurd, by means of an eccentric with an epicycle so that he might have [a device with] equal motion about its own center.”

“... the astronomer is free to devise or imagine circles, epicycles, and similar devices although they might not exist in nature.... The astronomer who endeavors to discuss the truth of the positions of these or those bodies acts as a Physicist and not as an Astronomer—and, in my opinion, he arrives at nothing with certainty.”

Johannes Praetorius (1537–1616)
unpublished lecture notes, circa 1570–1605,
quoted in Robert Westman, *The Copernican Achievement*, page 292ff

Note: From other manuscript evidence, it appears that Praetorius was impressed by Copernicus’ unique ordering of the planets, and attempted to transfer that ordering to a geocentric context—something that Tycho Brahe actually did. However, Praetorius ran into a problem we have already encountered: In his scheme, the sphere of Mars intersected the sphere of the sun. Apparently he never found a solution satisfactory to him.

These two quotations represent radically different early reaction to the work of Copernicus by two trained and capable astronomers. Rheticus we have already met: He studied with Copernicus starting in 1539, and was instrumental in the publication of *De Revolutionibus*. Praetorius was one of the “Melanchthon circle” astronomers centered around Wittenberg.

Discuss these quotations in any format that seems appropriate to you. Feel free to use other material that may be relevant to these quotations—much of the material in Kuhn’s *Copernican Revolution* and in the various handouts is relevant to an understanding of these two points of view. Note that both Rheticus and Pretorius allude to some of the more technical features of Ptolemaic and Copernican astronomy; *you should be sure that you understand them*, so that you can work with the astronomical and physical arguments made in the quotations. Your discussion should be succinct, but as detailed, and analytic as possible. Essays are subject to the usual restrictions (see course outline).