

ulations of the Church with bitter mockery, and had spoken altogether too frankly of her dogmas. Against the author of Candle-makers, who scoffed at the mummery of relics and the hypocrisy of ecclesiastics, who compared Christ to a Centaur, who had attacked with all his strength the foundation pillar of the Church, the holy Aristotle, she might have been in a necessarily defensive attitude that does not excuse her proceeding, but shows it in a milder light. In Galileo's case, on the contrary, it concerned a scholar, who without making an attack on the teaching of the Church, without deviating in any way from the objects of his physical and astronomical studies, merely wished to lay before the world the results of his investigations.

Shortly after (1608) Galileo learned that a Dutch optician, Johann Lippershey in Middleburg, had, by the combination of several lenses, produced an instrument with which the heavenly bodies could be seen more distinctly. This led him to make for himself a telescope (1609) in order to extend the field of vision, and to gain a deeper insight into the construction of the universe, as well as into the peculiarities of the heavenly bodies, than had thus far been possible to Copernicus, Tycho Brahe and his friend Kepler. The hoped-for result was attained; he immediately discovered the satellites of Jupiter, described in his *Sidereus Nuncius* (1610), the moon-like phases of Venus and Mercury predicted by Copernicus, and finally the sun-spots (October, 1610), which proved the revolution of the sun on its axis, already taught by Copernicus.

These discoveries were so many confirmations of the Copernican system; the planets were clearly shown to be dark bodies, which, like the moon and earth, received their light from the sun; and the satellites of Jupiter were brought to view as a miniature model of the solar system.

It was not long, however, before the discoveries effected through Galileo's telescope were branded as mere hallucinations and delusions. Then did the master pour forth his troubles to Kepler, his friend to the north of the Alps: "You are the first and almost the only one who, without having seen for himself, gives full credence to my statements. What will you say of the first teachers of Padua, who, when I made them the offer, would neither look at the planets or the moon through the telescope, nor even examine the latter? Men of this class regard philosophy as a book like the *Aeneid* or the *Odyssey*, and believe that truth is not to be sought either in the world or in nature, but only in a comparison of texts. How you would have laughed, when at Pisa the first

teacher in the university there endeavored, in the presence of the grand duke, to draw the new heavenly bodies from the sky with logical demonstrations, as though with magical conjurations!"

Soon after, a Dominican monk, Caccini of Florence, in a sermon on a text which seemed made for the occasion, "Ye men of Galilee, why stand ye gazing up into heaven?" thundered against the man who dared attack the infallibility of the orthodox interpretation of the Bible as the result of mere star-gazing. He was joined by Father Lorini, his friend and a member of the same order, who added a denunciation of the erroneous teachings of the Florentine physicist, addressing it to the Holy Office in Rome. It was well received, and immediately preliminary and secret proceedings were instituted against the offender. With that began the ever memorable trial of Galileo.

Galileo, who at the outset knew nothing of these proceedings secretly begun against him, stirred up his adversaries still more by continuing to rely on his just claims in an open letter to the Dowager Grand Duchess. "First take care," he writes, "to refute the arguments of Copernicus and his followers, and leave the concern of condemning them as heretical or erroneous to those to whom it belongs; but do not hope from the discreet as well as intelligent fathers of the Church, and from their absolute wisdom which cannot err, that rash decision to which you, urged on by personal interests and passions, would allow yourself to be hurried. For it is indeed beyond doubt that in regard to these or other similar assertions which are not directly *de fide*, His Holiness the Pope has always the absolute power to pronounce them good or to condemn them, but it is not in the power of any human being to cause them to be true or false or other than they are *de facto* from their nature." These words, as bold as they were true, were certainly not calculated to make his opponents more indulgent.

On the 24th of February, 1616, the commission convened by the Holy Office unanimously arrived at the following decision: That the declaration that the sun forms the center of the universe, and is without local movement in space, is "foolish and absurd from a philosophical standpoint," and is "heretical from a religious standpoint, inasmuch as it contradicts the tenets of Holy Scripture in many places, both according to the plain meaning of the words and according to the universal interpretation of the holy fathers and learned theologians."

He had at that time written a work on the phenomenon of the tide and sent it (1618) to his

patron, the Archduke Leopold of Austria, with a note which contained the following words: "Because I am now aware that it is fitting to believe and to obey the decisions of the superiors; they being directed by a higher intelligence to which my mind is too base to soar alone, I regard this work, which I send to you, so far as it rests on the assumption of the two-fold movement of the earth, even though it contains one of the arguments which I brought forward in corroboration of that view, merely as a poem or rather as a dream; as such your highness may receive it. But even poets at times place a value on one or another of their fancies, so likewise do I place some value on this, my dream."

Naturally such utterances always reached the ears of the pious fathers, and roused them to renewed fury. At this time Kepler, in Prague, although in the service of his apostolic majesty, also acknowledged himself as favoring the Copernican theory, and in the same year (1618) in which Galileo's work began to stir up discussions, he made the immortal discovery of the third law governing the movements of the planets. In the same year, also, occurred the first rising of the Protestants in Prague, which ushered in the Thirty Years' War. Therefore the Church, at that time under the direction of the Jesuits, believed that it ought to make a ruthless attempt to win back the territory lost through the Reformation, even though the peace and prosperity of the whole of Central Europe should be destroyed thereby. There was felt only too well the close relationship between the new astronomical discoveries and the opposition of the Protestant spirit to the authority of the Church. It is probable that now, for the first time, was recognized distinctly all that would result from the belief that the earth could no longer, according to the views of Aristotle, be looked upon as the center of the universe, around which everything should turn and all other stars revolve, even as the thoughts and destiny of mankind should circle about the immovable rock of the Church at Rome. When the discovery of America had demonstrated the untenability of the old opposition to mathematics and the teaching of the antipodes, there was some measure of uncertainty felt as to what was to be done about the new teachings and discoveries; but now all at once was seen the abyss which was opening in place of the old, sure geocentric foundation for school and church.

The Pope, from a warm admirer of Galileo, became a secret enemy, and gave the Jesuits entire liberty of action in the matter. Galileo's trial before the Inquisition was thereupon begun in great haste on

the 15th of September, 1632. He was not for a moment in doubt that he was now delivered over to the mercy of the Jesuits, and that in spite of all his intercession he must expect the worst. He wrote: "I hear from a reliable source that the Jesuit fathers have inspired those in authority with the conviction that this book of mine is more abominable and more harmful to the Church than the writings of Luther and Calvin. . . ." Concern for his future, and the journey, in those days so tiresome, had so weakened him that the ambassador feared for his life. For we must consider that the prospect of torture and the stake never once left the sick old man in the prison of the Inquisition. The burning of Giordano Bruno (1600) and Lucilio Vanini [1619] were still fresh in memory, and Galileo had no desire to be a hero of the faith. He had no longing for the martyr's crown, nor was he a philosopher, whom it might disgrace to give up his convictions; he was simply a naturalist, whose observations were not attacked, but who was only forbidden to give them a precise interpretation. He remained twenty-three days imprisoned in the palace of the Inquisition, and was brought before his judges four times. On the 16th of June, 1633, a decree was issued by the Holy Office, which arranged the criminal proceedings and threatened Galileo with the rack in case he would not confess the whole truth. On the 21st of June the last trial examination took place, of which it is said in the extant verdict pronounced on the following day: "As it seemed to us, however, that the whole truth was not told by you in regard to your purpose, we considered it necessary to have recourse to the *examen rigorosum* against you, where you answered as a Catholic."

The formula of abjuration, which probably followed immediately after the announcement of the sentence, contains, after the acknowledgment of the justice of the sentence passed upon him, the solemn promise wrung from him in face of torture: ". . . with an upright heart and unfeigned sincerity I abjure, execrate and express my abhorrence of the above-mentioned errors and heresies [namely, that the sun, and not the earth, is the motionless center of the universe], and swear that in future I will never by word or writing assert or maintain anything whatever on account of which I might incur similar suspicion."

That he at the same time added to himself, "It moves just the same," and remained faithful to this belief to the end of his life may, as has already been mentioned, be safely assumed.

He was released two days later from prison and assigned as residence, under constant ecclesiastical