

SOME ASPECTS OF THE INTELLECTUAL RELATIONS
BETWEEN GALILEO AND THE JESUITS

by

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ABSTRACT

During the years from 1616 (when the Decree prohibiting two Copernican propositions was issued by the Congregation of the Index) to 1623 (when Galileo published The Assayer) Jesuits of the Roman College made several attempts to draw Galileo into further discussion of his work. This was not with the intention of checking his obedience to the Decree, but in order to test the strength of any continuing work. The evidence suggests that there were certain Jesuits, who were willing, even determined, to re-open debate with him. They made a genuine attempt to build a new synthesis, aligning the established world picture with some of the new astronomical observations. The initiatory moves in these attempts, always made through a third party, ranged from the oblique to the overtly demanding.

As early as 1614 a group of Jesuits at Ingoldstadt saw problems in the way the new astronomical discoveries could be used by those interested in magic and astrology, and asked Aquaviva the General of the Society of Jesus to prohibit one of their members from writing in praise of Galileo's work. From this initial move against the Galilean findings, there stemmed a reactionary group which led to a reaffirmation of the primacy of the Aristotelian cosmology, in the Roman College in 1624.

With the Ludovisi Papacy, initiated by the election of Cardinal Ludovisi as Pope Gregory XV there emerged a lighter, more buoyant intellectual atmosphere, one in which Pope and Cardinal Nephew

played a leading role. This change in Papal outlook caused Galileo to think there was the possibility that the severity of the 1616 Decree might be lessened, and as a consequence his long-promised book The Assayer was completed and appeared in manuscript early in 1623. During the time of its printing Gregory XV died and Maffeo Barberini became Urban VIII, and though this seemed to offer even better possibilities for Galileo, in the event there were to be greater problems ahead.

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COMMENT ON TRANSLATIONS

Where an English translation of Galilean writings and correspondence had already been published I have used it and cited its source. The translations from the Latin are the work of Father Michael Williams, Scholar and Head of Divinity, Trinity and All Saints Colleges, Horsforth, Nr. Leeds. Other translations are my own and in the case of those from the Italian are very literal. I chose not to adjust them in order to keep the spontaneity and in many cases the deliberate ambiguity of the writers.

ABBREVIATIONS OF REFERENCES

For easier reading several references will be abbreviated as follows:

1. Drake and O'Malley. The Controversy on the Comets of 1618.
Univ. of Pennsylvania Press: Philadelphia, 1960.

This is a collection of papers by Horatio Grassi, S.J., Mario Guiducci, Galileo Galilei, and Johann Kepler, concerning the nature of comets. The papers have been translated into English by Stillman Drake and C.D. O'Malley, with an introduction and additional notes by Stillman Drake.

The papers are:

- | | |
|---------------------|---|
| (a) Horatio Grassi | <u>An Astronomical Disputation on
the Three Comets of the Year 1618</u> |
| (b) Mario Guiducci | <u>Discourse on the Comets</u> |
| (c) Horatio Grassi | <u>The Astronomical and Philosophical
Balance</u> |
| (d) Mario Guiducci | <u>Letter to Tarquinio Galluzzi</u> |
| (e) Galileo Galilei | <u>The Assayer</u> |
| (f) Johann Kepler | <u>Appendix to the Hyperaspistes</u> |

The first five of these will be referred to continually throughout the thesis with full title. In the references the titles of the book and the papers will be abbreviated and page numbers given, as follows:

- (a) Comet Controversy, Astronomical Disputation, page no.

- (b) Comet Controversy, Discourse, page no.
- (c) Comet Controversy, Astronomical Balance, page no.
- (d) Comet Controversy, Tarquinio letter, page no.
- (e) Comet Controversy, Assayer, page no.

Where the text referred to is from the introduction or Notes the information given will be:

Comet Controversy, page no.

2. Antonio Favaro, Le Opere di Galileo Galilei, Ristampa della Edizione Nazionale, 20 volumes. G. Barbera: Firenze, 1929-1939.

This is a collection of the papers and correspondence by and concerning Galileo Galilei, collected and edited by Antonio Favaro. Since the comparing of dates and events is of the utmost importance in this thesis each reference will give the writer, the recipient, the date and volume number. Item numbers will not be included, and page numbers will only be used where I refer to passages which are not letters. The reference will be thus:

Ed. Naz. Vol. -- Galileo to Guiducci, date.

3. Antonio Favaro. Amici e Corrispondenti di Galileo Galilei. XXXVII. Mario Guiducci. (Atti del Reale Istituto Veneto di Scienze, Lettere ed arti, 1915-16, Tomo LXXV - Parte Seconda) Premiate Officine Grafiche di Carlo Ferrari; Venezia, 1916.

Antonio Favaro wrote many long articles concerning the working relationships between Galileo and particular friends, correspondents and opponents. The one concerning Guiducci and Galileo is used in several chapters. The reference will be:

Favaro on Guiducci, page no.

4. Anton Durrwachter, 'Adam Tanner und die Steganographie des Trithemius', in Hermann Grauert, Festgabe zur Vollendung des 60 Lebensjahres, zum 7th Sept 1910. Edited by Maz Jansen. Herdersche Verlagshandlung: Freiburg im Breisgau, 1910.

This will be referred to as follows:

H. Grauert, Durrwachter on Tanner, page no.

PROLOGUE

The purpose of this thesis is to examine some aspects of the history of the Galileo affair, particularly with regard to the changing relationships between Galileo (the man, his lifestyle and his work) and members of the Society of Jesus. Since the argument of the thesis both builds on and continues the work of other scholars, I must first outline the received account in order to understand and to identify unresolved problems. In compiling this account I have drawn largely on the work of Giorgio de Santillana, Stillman Drake, Arthur Koestler and James Brodrick.

From his correspondence with Johannes Kepler in 1597,¹ we learn that Galileo Galilei was willing to admit to the renowned astronomer that he accepted the heliocentric system propounded by Nicholas Copernicus (in his work On the Revolutions of the Heavenly Orbs of 1543) as a physical description of the universe. Nevertheless, as a rider to this admission to Kepler, Galileo intimated that owing to dangerous opposition it was not politic to broadcast his views.

At this time Galileo, a man of 32, was teaching mathematics at the University of Padua, with a few papers and inventions to his credit and with some notable names in the world of mathematics and astronomy among his correspondents.

However, it was not until 1610 that he was to achieve fame and notoriety for his telescopic discoveries. In 1608 a device had been invented in Holland, which purported to make far away objects appear nearer, thus enhancing observations made from a considerable

distance. Galileo heard of this when visiting Venice in the summer of 1609 and through his own knowledge of optics was able to produce a similar instrument, which he offered to the Venetian Doge, as an aid for viewing the arrival of ships much earlier than had been possible with the normal naked-eye lookout system of the maritime republic.

More importantly, Galileo continued to experiment with different lenses, grinding them himself until he achieved much higher powers of magnification and then he began making regular observations of the moon and the heavens. What he observed supported him in his conviction that the bodies in the universe moved heliocentrically. In 1610 he detailed his discoveries in The Starry Messenger, a book which quickly achieved wide acclaim.

However, Galileo's work, which was to continue over the next three decades, never contained a proof of heliocentrism. In the event his account elicited response from vociferous groups of scholars who, while discussing the new discoveries with approbation or scorn, clouded what one might have expected to be the central issue - the question of proving heliocentricity. There was no closely reasoned argument showing how the new information concerning the heavens supported, or did not support, Copernicanism.

There is much in the events following the appearance of The Starry Messenger in 1610 to suggest that the Church authorities were reserving judgment on this issue, but for the interested scholars and scholastics, lesser churchmen and the literati, this apparently reserved attitude by the Church looked like evasion: opponents

and admirers alike wanted instant reaction and sought to evoke it.

In March 1611 Galileo visited Rome and the Roman College to discuss his observations with a number of interested parties. Following the appearance of The Starry Messenger, Fathers Clavius and Grienberger had doubted the reliability of the new instrument and the revelations claimed for it by Galileo. Fr. Christopher Clavius was Professor of Mathematics in the Roman College until his death in 1612. His Treatise on the Sphere of 1570, had nineteen reprints during the following fifty years. Fr. Christopher Grienberger would succeed Clavius as Professor of Mathematics on the latter's death. By December of 1610, however, Fr. Clavius was full of praise for the telescope, and wrote to Galileo² telling him "truly you are worthy of great praise" and that the new instrument would be of "inestimable value". Clavius wrote that he and his colleagues had seen the multitude of stars in the Pleiades, Cancer, Orion and the Milky Way and had " marvelled greatly at the unevenness and roughness at the boundary line of shadow on the moon when it is not full."

The visit to Rome was a triumph for Galileo, not only scholars and Churchmen met him with respect and admiration, he was also received by Pope Paul V. He had several informal and friendly meetings with the scholars at the Roman College and in addition Father Clavius and his fellows marked the outstanding nature of his work with a day of ceremony and respect to Galileo.

These were signs of honour indeed, and it could hardly have been otherwise: he had made an unprecedented contribution to the

world of learning. At this stage the excitement of the new discoveries obscured, for many, the possible problems these discoveries might cause. They saw the wonders of the vastly expanded universe, however they may not have appreciated Galileo's conviction that his observations confirmed the Copernican view.

In April 1611 Cardinal Bellarmine, who had now seen the discoveries, wrote to "the Mathematicians of the Roman College" requesting their views on five specific points in Galileo's work.³ He wanted their approval of "the multitude of fixed stars, invisible to the naked eye", "that Saturn is not one simple star but three stars", "that the star Venus waxes and wanes like the moon", "that the surface of the moon is rough and uneven" and "that there are four moving stars around the planet Jupiter".

Clavius, Grienberger, Malecote, and Lembo, did indeed verify the astronomical discoveries,⁴ with one proviso. Concerning Cardinal Bellarmine's fourth point they said,

"it is not possible to dispute the great roughness of the moon, but it appears to F. Clavius more probable that it is not the surface which is rough, but more that the body of the moon is not uniformly dense and that it has portions more dense and more rarified, like the marks which can be seen with the naked eye. Others think the surface is truly rough, but are not so certain that we may affirm it indubitably."

This view of Father Clavius was welcomed by the Aristotelians, and delle Colombe wrote to him, approvingly, the following month.⁵ Fr. Clavius died in 1612 and Stillman Drake tells us that in a final revision of his work Clavius, although he did not moderate his rejection of Copernicus, noted Galileo's telescopic discoveries and the necessity for astronomers to account for them.⁶

Galileo's commitment to a Copernican paradigm is stated in The Starry Messenger, stated although not stressed - Galileo was a master in the art of gentle introduction of his ideas. His close adherents and those of his correspondents who knew his acceptance of Copernicus' work could understand how each of his separate discoveries were bound together and were to be used towards forging a confirmation of heliocentrism - for them further statement was perhaps unnecessary. The gentle introduction was for the many hundreds of readers and scholars who could be entranced one by one as his separate discoveries were detailed, and who then might look differently at the standard Aristotelian account. It would also have been some palliative against the expected fierce reaction.

In the next two years he continued work, sharing his discoveries and ideas with his ever growing number of correspondents. In 1613 he published in Rome his History and Demonstrations Concerning Sunspots and their phenomena (more often referred to as Letters on Sunspots), this being the publication of a set of letters on the subject of spots on the sun, initiated by Mark Welser, fellow Lincean. Welser was the intermediary between Galileo and an unnamed scholar, who for the purpose of this interchange took the pseudonym Apelles.

The man behind the pseudonym was Father Christopher Scheiner, a Jesuit mathematician of great merit at Ingoldstadt, who claimed to have discovered sunspots, declaring them to be small stars revolving in tight circles round the sun.⁷ Galileo's rejection of Scheiner's claim to priority (and of his conclusions concerning the nature of the spots) became the basis of life-long enmity on Scheiner's

part. In a later chapter it will be shown that Father Scheiner wanted to continue this debate, but was prevented from doing so by Aquaviva, General of the Society of Jesus.

Jesuits at the Roman College, in 1612, supported the explanation of sunspots as small stars orbiting round the sun close to its surface,⁸ presumably in preference to the possibility of actual marks or distortions on the face of the sun which was supposed to be immaculate. So, although they had accepted much of Galileo's earlier work concerning the newly discovered stars and their movements, many were still unwilling to discard the firmly ingrained Aristotelian tenet of the peculiarly celestial nature of the sun. Galileo's account of sunspots left no-one in any doubt that he thought the marks were located on the sun's surface:

"no better model could be found than to put some drops of incombustible bitumen on a red hot iron plate. From the black spot thus impressed on the iron, there will arise a black smoke that⁹ will disperse in strange and changing shapes".

In Letters on Sunspots Galileo moved from "gentle introduction" to open statement of his acceptance of Copernicanism. He coupled his earlier discoveries of The Starry Messenger with his subsequent discoveries of the movements, duration and nature of the solar spots to show that they:

"harmonised admirably with the great Copernican system, to the universal revelation of which doctrine propitious breezes are now seen to be directed towards us".¹⁰

Galileo had received much fame and honour with The Starry Messenger and yet it was equally the case that he had reaped ridicule, envy and enmity, all of which can easily be understood. That a

tube with a piece of glass in each end could yield so much new information about the heavens must have seemed either doubtful and laughable, or magic and sinister; for this first sense-extending instrument there were no means of evaluation.

One of his earlier discoveries had been the four stars circling Jupiter, which he had named the Medicean stars in honour of Cosimo II de' Medici, Fourth Grand Duke of Tuscany, at whose court he was well known. As a result partly of this dedicatory gesture and partly of his own request conveyed to the Grand Duke through Belisario Vinta, Florentine Secretary of State, Galileo became attached to the Ducal household as chief philosopher and mathematician. This advantageous move coupled with the fame arising from The Starry Messenger gave Galileo a position and intellectual power which others might well have envied and feared.

The enmity, although it too can be well understood, demands more detail and discussion, and it came from more than one quarter.

An academic group loosely comprised of scholastic Aristotelians, of whom Ludovici delle Colombe was a prime mover, resisted Galileo's apparent denigration of Aristotle's physics. If it should be said that this group of men, as professors and teachers of the works of Aristotle, had a vested interest in maintaining the ancient ideas, this would be a superficial and cynical assessment. They were men whose minds and bodies responded to the world of Aristotle; their physical environment and their sense-experience were completely in accord - any anomalies arising from the Aristotelian account were not immediate experiential problems, rather they were subjects

for discussion, and their role had never been to check the work of Aristotle against the external world. The task in hand had been a scholastic endeavour comparing translations and commentaries. Galileo's work threatened both their academic standing and their sense-experience; literally and figuratively Galileo was cutting the ground from under their feet.

Colombe was to play a leading part in the attack on Galileo heading what de Santillana calls the Peripatetic coalition, which included Boscaglia, Coresio, d'Elci and Magini, together with a number of Dominicans. The Dominican section of this combination, who attacked on a Biblical front, felt that Galileo's work threatened the veracity of Scripture, and included Father Tommaso Caccini a man with some reputation for mischief,¹¹ and Father Lorini a professor of ecclesiastical history in Florence.

It was Colombe, Caccini and Lorini who moved most persistently against Galileo and sought to provoke the Church authorities into action. The first move had come in 1610 immediately after the publication of The Starry Messenger, when Ludovici delle Colombe presented what he claimed was a refutation of heliocentrism.¹² It was, as one would expect, a defence of the Aristotelian system, further reinforced by a selection from those Scriptural passages which had long been construed as describing the geocentric universe. Galileo's supporters had been loud in their praise of The Starry Messenger, but Colombe, his immediate colleagues and other staunch Aristotelians, both academic and ecclesiastic, were equally vociferous in their disapproval. The apparent seal of acceptance given to Galileo by

the Roman College in 1611 and the favourable report to Cardinal Bellarmine had been a setback for the members of Colombe's 'Pigeon League'¹³ in their attempts to discredit Galileo's work.

On his visit to the Roman College, Galileo had been invited to become a member of the Accademia dei Lincei, founded and organised by Prince Federico Cesi, as a base for the introduction and discussion of new ideas in science and against Aristotelianism. Galileo had been pleased by the invitation and readily accepted, thus possibly evoking further anger and annoyance from his opponents.

The wrath of the Aristotelian scholars had apparently provoked little response from Church authorities in 1610 and 1611, so following the blatant advocacy of Copernicus' theory in Letters on Sunspots, a public protest against the new ideas was made by Father Lorini, a Dominican and member of the Colombe group, in Florence in late 1612.¹⁴ Within a few days Father Lorini, a man of 70, wrote to Galileo in apology, denying that he had spoken against him, and amusing Galileo by referring to Copernicus as "Ipernicus". Galileo, however, was wrong to dismiss Lorini as a silly old man, as he was to attack again later. This incident marks the hardening of the opposition to Galileo.¹⁵

A year later there was an incident in December of 1613 which was to have far-reaching consequences and this too was initiated by members of the coalition. It occurred at a court dinner, with the Grand Duke Cosimo II, his wife, his mother the Dowager Grand Duchess Christina, and Father Castelli, a close friend of Galileo, among those present. There was also Cosimo Boscaglia, Professor

of Philosophy at the University of Pisa, and a member of the Colombe group. Father Castelli had written to Galileo informing him that at the dinner there had been talk concerning the telescopic discoveries. Boscaglia, in answer to queries from the Grand Duchess Christina, had said that the astronomical discoveries which Galileo had made were indeed true, but that the motion of the earth could not take place, in particular because the Holy Scripture was contrary to this view.

The Grand Duchess had then questioned Father Castelli closely, concerning the orthodoxy of the Copernican account. Castelli, as theologian, had argued to good effect, convincing the Grand Duke and his wife that the two accounts could be compatible. The Grand Duchess had remained unconvinced.¹⁶

When Galileo read the letter from Castelli he felt that the opposition was trying to move the cosmological discussion into the dangerous area of theological exegesis, and was also seeking to alienate him from his secure niche in the Ducal household. In reply to Castelli, Galileo wrote a defence of his own position, attempting to delineate the bounds of science and of religion. He outlined how the Joshua story might be interpreted within a heliocentric universe.¹⁷

The letter was read by Castelli and by others, and as word of the letter by Galileo spread it was said that he had challenged Scripture, but at this stage it evoked no response from the Church authorities. Galileo had expounded his reinterpretation of Scripture, an area in which he had no qualification, but the Church authorities

made no public remark on Galileo's trespass into the theological field at this time.

Twelve months after the Castelli letter the opposition tried again to provoke reaction to the Galileo affair. Father Caccini, a Dominican monk and part of the Colombe group, preached against mathematicians and mathematics and the heresy of a moving earth. This was on December 20th 1614, in Santa Maria Novella and, although Galileo was not mentioned by name, it was made clear that Caccini was denouncing Galileo, the text used being "Ye men of Galilee, why stand ye gazing up into heaven?"

During the same month Father Lorini, the Dominican who had written of Copernicus as "Ipernicus", had the opportunity to copy Galileo's letter to Castelli. On February 7th 1615 he forwarded to Cardinal Sfondrati a manuscript which he said was a copy of the Castelli letter, but which (as de Santillana has shown) differed from the original in one or two important sections.¹⁸ In the covering letter Lorini wrote of his own concern and that of his confrères that the Castelli letter contained "suspicious and presumptuous propositions" and that these were "now being said and spread through all of our city".¹⁹

Galileo, meanwhile, learning of Father Lorini's latest attempt to discredit him, thought it wise to ensure that if some copy of the Castelli letter were to be read by members of the Holy Office then a true copy of what he had actually written should be seen by someone in authority. On February 16th he sent his copy, with a covering letter expanding particular points, to a friend in Rome

- Dini - whom he commissioned to forward these letters to Father Grienberger who might then show them to Cardinal Bellarmine.²⁰

It is instructive to note that at this time Galileo still had trust and respect for these two leading Jesuits.

In order to have a precise account of the Castelli letter, following the complaint by Father Lorini, on February 26th the Holy Office asked the Archbishop of Pisa to obtain the original letter from Father Castelli. In the letter relaying this information to Galileo, Castelli recorded that the Archbishop had spoken of the movement of the earth and had said that it was soon to be made known that these ideas were all silly and that they deserved condemnation.²¹

Father Castelli told the Archbishop that he had no copy of the letter but would ask Galileo to send one. Disturbed by Castelli's account of the Archbishop's conversation, Galileo delayed complying with his request, but eventually sent Castelli an unsigned copy which the Archbishop saw but did not retain.

Galileo was particularly cautious in this matter being aware of the scandal which his opponents were raising and aware too, that in offering criteria for the realm of the natural philosopher he had suggested a limit to the role of theologian: a very dangerous trespass indeed. However, it was reported to him that the unsigned copy had been read to the Archbishop and that he had found it to be satisfactory.²²

Dini, who had been asked by Galileo to discover the reactions of Father Grienberger and Cardinal Bellarmine to the Castelli letter, was able to write at the beginning of March that the Cardinal had

said there was no question of Copernicus' book being prohibited, at the worst a marginal entry might be inserted stating that the theory had been devised to save appearances.²³ With similar caution Galileo might continue his work.

The wish to delay a definitive pronouncement on the new discoveries and their implication is very evident in Dini's letter to Galileo, assuming that it is a true record of Cardinal Bellarmine's views. The Cardinal had said that the Biblical passage "the sun exults as a strong man to run his course" was an obstacle to Copernicus' hypothesis, since it had until then been understood to refer to the motion of the sun. In reply Dini suggested that the text could also be explained as a concession to our ordinary forms of language. Dini quotes the Cardinal as saying:

"it was not a thing to do in haste, just as it is not in order to rush to condemn these opinions".²⁴

It appeared possible, at the beginning of March, that the scandal which Lorini had tried to bring about had been quickly dampened. The Archbishop had been satisfied with the authentic Galileo to Castelli letter, and Cardinal Bellarmine had apparently not been alarmed at its contents. Was it safe to assume that danger had been averted once more? Certainly de Santillana tells us that on March 13th the matter was closed by a routine annotation,²⁵ but in the event it was only to be a temporary respite. As though prepared for the possibility that the carefully altered Castelli letter, submitted by Lorini to Cardinal Sfondrati, might not produce punitive result for Galileo, Fr. Caccini came to Rome on a personal mission. He asked the Cardinal of Aracoeli to lay a request on his behalf,

before the Holy Office, which was duly granted:

"Sanctissimus gave orders for the examination of Fr. Thomas Caccini, who the Cardinal of Aracoeli says, is informed concerning the errors of Galileo and begs to testify on them for the exoneration of his conscience".²⁶

In the ensuing interview on March 20th, he made a strong case against Galileo and the Galileists for their impieties and heresies, naming men who would support Caccini's indictments.

It was some months before the evidence was checked and the witnesses brought forward to substantiate Caccini's assertions, but it was eventually carefully sifted and added to the file on Galileo in November of 1615. De Santillana tells us that some of the marginal notes are concerned with 'Letters on the Solar Spots', 'Lincci', 'German mathematicians' and 'Sarpi',²⁷ which gives some indication of the sensitive spots in the Galileo story, some of which will be discussed in later chapters.

On February 25th 1616 the Decree was issued in which Cardinal Bellarmine was requested to summon Galileo for audience, so that he might be instructed that two major Copernican propositions were erroneous and must be relinquished. The meeting for this purpose took place on February 26th 1616, which date effectively marks the end of the initial stage in Galileo's programme of promotion for the acceptance of the Copernican hypothesis as the true description of the universe.

The period of discovery was now closed; this fact, however, is known to us only by hindsight and could not have been foreseen. There was nothing in the Decree which necessitated the end of Galileo's

observational astronomy, nor of publication of any further findings. Indeed the handling of the investigation by the Church authorities and their ultimate action is notable for the absence of any blame or censure of Galileo. The work of Copernicus was to be suspended pending correction, which when undertaken some few years later involved surprisingly little emendation. A paper by Foscarini which had supported Galileo's views, but which had probed the matter with more zeal and less skill than Galileo, was now prohibited. The works of Galileo were not mentioned although he was to be informed of the censures on two major Copernican propositions.²⁸

There was nothing in this to suggest nor imply that the great period of discovery was finished, and we shall see in the following chapters that over the ensuing years there were those who maintained an interest in the possibility of further Galilean findings; perhaps we might even say there was a degree of skilful, covert encouragement, but new astronomical observation was never forthcoming.

His work over the next decade was on tides, comets, his philosophy of nature, moreover he discreetly continued to remind the scholarly world of the motion of the earth when the opportunity presented itself.

This was an ironical situation in that he had not been prohibited from attempting further astronomical observations. Additional new work and discoveries, if not of value to his now forbidden Copernican cause, might have further enhanced his scholarly standing, particularly with those Jesuits who had taken pleasure in duplicating and confirming his findings. We know such Jesuit mathematicians to have been at

the Roman College where Father Clavius and Father Grienberger had validated his observations, and at Ingoldstadt where Father Tanner and Father Scheiner had also duplicated the observations on sunspots,²⁹ further details of which will be given in Chapter 2.

Sadly, no further astronomical work was forthcoming, although why this should have been the case is not at all clear. Galileo may have continued his work and kept the results to himself, or it may have been some technical problem which prevented him producing lenses of greater power. One clue suggests that it might have been a combination of both factors. In The Assayer of 1623 Galileo tells us that during the entire time when the comet of 1618/19 was visible, a period of five months, he was ill and unable to view the comet. This seems incompatible both with his nature and with the subsequent detailed discussion of the comet in Discourse on Comets in 1619, a paper produced in collaboration with Mario Guiducci, and shows a reluctance to admit to observational activity.

On the other hand, one feels that had he made any impressive discoveries these would have been relayed to his admirers. Unfortunately at this crucial point in his career it seems as though he had reached a plateau in his observational astronomical work.

The trial of Galileo was not to take place until 1633 and was, in part, a result of the publication in 1632 of his Dialogue Concerning the Two World Systems, but it is beyond doubt that the enmity and antagonism towards him, which would be so evident during the period leading to his trial, began in the period between 1610 and 1616.

In the years following the Decree a thin line of communication

was maintained between Galileo and a group of Jesuits within the Roman College, who showed continuing interest in his work. I have found much evidence that they might have been willing to review the implications of the new astronomy if and when he produced additional arguments. This attempt at dialogue, initiated by one group of Jesuits, rejected by Galileo, and crudely suppressed by other Jesuits in 1625, which has not been previously discussed by contemporary scholars, will be explored in the following chapters.

The omission of such illuminating material from the Galileo historiography is surprising, since it offers very different interpretations from the standard account and also yields several possible lines for further research. In giving details of the attempted dialogue, and of other factors previously overlooked, I hope to open up a number of important issues.

Our leading scholars have attributed Galileo's problems to different causes, but almost always within the framework of the confrontation of Galileo and the Church, with particular emphasis on conflict between him and the Society of Jesus.³⁰ If, as I contend and hope to illustrate, this framework of confrontation is inapplicable to Galileo's problems, it is not surprising that we are still very far from any complete understanding of the forces which undermined and subsequently destroyed his career. Further enlightenment should be sought in a different context. The one I have used has always been available, but has been overshadowed by the greater power of an anti-religion theme in a largely anti-religious period, or overlooked where it did not fit the preconceived conflict thesis.

I quote here certain succinct passages, made by contemporary scholars, which can be considered as offering their conclusions concerning the Galileo story.

Giorgio de Santillana, in The Crime of Galileo, lays the blame for Galileo's problems at Cardinal Bellarmine's door, giving little credit to the Cardinal's intellectual prowess and integrity: for de Santillana, "the historic responsibility falls on Bellarmine alone who, had he had sufficient intellect to grasp the issue, would have put the matter forward for a future agenda when the new science would have had a chance to enter the circle of orthodoxy".³¹

According to de Santillana, Bellarmine judged the issue on the basis of Caccini's deliberately scandalous statement and was, in effect, the only judge.

"they gave him (Bellarmine) Caccini's stuff, under the name of Galileo's propositions; it went in, was processed, qualified, came out - still with the same label - was condemned, stamped, and expedited by the General Congregation".³²

That is de Santillana's view of Bellarmine's judgment.

When discussing the reaction of the scholars of the Roman College, to the Decree of 1616, he is equally denigrating and dismissive. He speaks of their "incredible passiveness", and of them "apparently taking their vow of obedience to dispense them from any intellectual responsibility, perhaps also of intellect", despite his assertion that "of their personal good disposition towards Galileo (that of the Jesuits) there is no doubt". De Santillana, in the above quoted comments, is writing of the response, or rather the apparent lack of response, from the Jesuits of the Roman College.

There are two errors in his conclusions.

Firstly, in the case of his claim that Bellarmine accepted Caccini's account as evidence, he overlooks the philosophical weight and the integrity of the Cardinal's reputation. This reputation was not based on a hagiography by his brothers, but on his recorded contribution to scholarship, and recognised by contemporaries of all persuasions. I hope to make this evident in Chapter 4.

Secondly, de Santillana assumes that the passivity, of which he accuses the Jesuits of the Roman College, extended to every Jesuit. An apparent compliance with the Decree of 1616 was to be expected and in many instances such compliance would be a reflection of sincere belief. However, it is necessary to establish whether there was an attempt by any Jesuit, or group of Jesuits, at further discussion of the forbidden propositions. I hope to show, in subsequent chapters, that such attempts were made.

Arthur Koestler in his The Sleepwalkers, also considers Cardinal Bellarmine to have been Galileo's chief opponent,³³ and he lays the blame for the harshness of the Decree of 1616 squarely on Bellarmine.

Of Bellarmine, Koestler writes:

"it is on him and not on the backwoodsmen, that the decision depends, and it was Bellarmine who had³⁴ challenged him (Galileo) to produce proof".

Koestler's thesis is that Cardinal Bellarmine had placed the burden of proof on Galileo, leaving him only two choices: either to supply the required proof (of the heliocentric system) or else to agree that the Copernican system should be treated, for the time

being, as a working hypothesis,³⁵ but Galileo was by now beyond reason. By accepting the compromise, says Koestler, he would disclose to the world that he had no proof and would be laughed out of court.³⁶ Thus Galileo faced a dilemma. His solution was to pretend he had the proof but to refuse to produce it, "on the grounds that his opponents were too stupid anyway to understand".

Koestler derives this last view from a section of a letter, from Galileo to Dini in May 1615, part of which is quoted in The Sleepwalkers,

"But how can I do this (i.e. supply proof), and not be merely wasting my time, when those Peripatetics who must be convinced show themselves incapable of following even the simplest and easiest of arguments?"³⁷

Directly below this quotation from Galileo's letter to Dini, and referring to this same letter, Koestler continues:

"The truly staggering thing in this passage is not its contemptuous arrogance, but the fact that while talking of 'Peripatetics' it is in fact aimed at Bellarmine..."

Koestler's assumption here is based on his premiss that Cardinal Bellarmine had in fact "challenged" Galileo to produce a proof and within a limited period of time.

My own interpretation of this question of proof is very different and assumes that Cardinal Bellarmine allowed for the possibility (admittedly the Cardinal most likely thought this had extremely low probability) that further proof might at some time be forthcoming. This also is detailed in my discussion of Cardinal Bellarmine in Chapter 4.

Stillman Drake, our most distinguished living scholar on Galileo, sees a large part of his problems emanating from the Dominicans. In 1957 Drake wrote that the Dominican Order "produced the zealots who made trouble for Galileo within the Church".³⁸ While this is true it has yet to be shown that this was part of a general Dominican attack, and Father Maraffi, Preacher General of the Dominicans, had been quick to apologise to Galileo in writing, following the occasion when Fr. Caccini had preached against him, not by naming Galileo but in using as text "Ye men of Galilee".³⁹ Caccini and Lorini were of the Dominican order but in their efforts to minimise Galileo's influence they were allied with zealots from several sections of the scholastic and ecclesiastical world.

That there was such an extended group, seems to be accepted by Professor Drake in a more recent work.⁴⁰ Stillman Drake, who has continuously researched the Galileo material and has meticulously published the fruits of his work throughout twenty-three years, has suggested that Galileo's⁴¹ own view can be understood from letters written by him in the years following the trial. Drake says:

"The cause for which Galileo suffered, in his own view, was clearly not Copernicanism but sound theology and Christian zeal ... What grieved Galileo was the theologians' error of 1616 ... their error was in his eyes a misapplication of law established by the ancient Fathers who had wisely separated science from religion".

Drake tells us that Galileo lay the blame for the decision to issue the Decree of 1616, and his subsequent tribulations, on "frauds and stratagems" perpetrated in Rome in 1616. Drake identifies the perpetrators as the professors of philosophy mentioned

in the Castelli letter, and his view is succinctly expressed in the penultimate paragraph of his book: ⁴²

"Galileo went on to say that if the frauds and stratagems that had been used at Rome in 1616 to impose upon the supreme authority could be revealed, the uprightness of his intentions would be clear. Since theologians were the supreme authority, the frauds and stratagems by which they had been imposed on must have come from other men, identified in the Letter to Christina as professors of philosophy. Similarly, by 'uprightness of intentions' Galileo cannot refer to support of Copernicus, but only to his campaign for freedom of scientific inquiry without Church intervention".

In his earlier work, Stillman Drake had seen the Dominicans as the chief instigators of the scandal which caused the authorities to relinquish their apparent intention of withholding judgment on Galileo; in the later work, he has been unable to move further, on this particular issue, than seeming to share with Galileo the belief that the professors of philosophy also played a part in the objections which forced the authorities to act. The elucidation of precise operational details for the coalition of forces which moved so consistently against Galileo, has yet to emerge.

James Brodrick S.J., in his discussion of the Decree of 1616 is keen to set the record straight, and tells us it was not a case of religion condemning science, but of "bad outmoded science condemning good science". ⁴³ However, these inappropriate labels of "bad science" and "good science" do not give us any clearer insight into what was happening in the realm of natural philosophy than did the discarded view of conflict between science and religion. The Aristotelian world was by no means outmoded at this time, although it may be possible from our standpoint and terms of reference to wonder at its tenacity.

If we read of the work and writings of the earliest of the scholars who moved into a world understood by applying a strict mathematics to idealised phenomena - men like Galileo himself, Kepler, Torricelli or Castelli - we may make the error of supposing it to be self-evident: that the power and probability of their method and results must supersede scholastic Aristotelian accounts. This did not happen quickly. The "outmoded science" of Brodrick was the prevailing theory and was to remain so for some decades.

The conclusions of Giorgio de Santillana, Stillman Drake, Arthur Koestler and Fr. Brodrick which I have discussed, although very briefly, serve to indicate contemporary assessments of the Galilean situation and provide the background for further research. I have attempted an examination of some of the events between 1616 and 1625 which seem to me to be of great importance and which have not previously been analysed. The significance of the year 1616 is that this was the year of the Decree concerning the decision on the Copernican hypothesis; the significance of the year 1625 will become evident in later chapters.

This examination suggests that just as there was a new science emerging, whose proponents started from mathematics applied to observations in Nature, there are indications that within the Church and the Orders also, there was a new trend emerging: there were men who saw that there might be a need to look with fresh eyes at some Scriptural passages which seemed contrary to possible implications of the new observations, and there is some indication that within the Society of Jesus such views might be entertained, albeit covertly.

The entire debate, concerning Galileo's assertion that his astronomical observations supported the Copernican theory, is strange in that this assertion was not the central issue and apparently was never discussed publicly nor in the privacy of Galileo's correspondence. The problems which were discussed and argued over arose from the fact that if the sun was central in the Heavens as Copernicanism demanded, then the Bible was wrong. Since such possibility could not be discussed publicly, and was not even considered by the majority, the controversy centred on the reinterpretation of Scripture; on whether this could be undertaken on relevant passages without throwing doubt on yet further sections, and on whom could responsibility for such an endeavour lie?

This area of debate was in an entirely different category from the problem presented by the astronomical observations, which should have been part of public discourse: did the separate discoveries, when taken together, really establish heliocentrism? If not, what remained to be added to the new account in order that the heliocentric system should be accepted as a tenable thesis?

What then were the observations with which Galileo intended to launch acceptance of the heliocentric universe? He had shown the moon to be a body not unlike the earth in topography, but with minimal atmosphere. He had shown that just as the moon circled the earth, so too did Venus circle the sun and that there were hitherto unseen stars circling Jupiter. He had drawn diagram after diagram detailing his observations of the solar spots, how they moved during the course of the day across the face of the sun, from the lower

left edge towards the upper right hand, disappearing over the rim and often seeming to reappear in attenuated shape round the lower edge, over a thirty-one day cycle not quite equal to that of the moon. Galileo suggested that these spots were "contiguous to the sun's surface" and used this work to illustrate his view of the sun as the hub of the universe.

From our modern point of view, one would have expected endless discussion on this new information, as philosophers and mathematicians strove to fit these separate features into some unified pattern, either that of the Copernican hypothesis or some other.⁴⁴ That would seem to have been the most obvious area for discussion. Galileo was committed to Copernicanism and sought to promote its acceptance. The contents of the correspondence and papers show that his admirers applauded him for the "novelty" of his work but were quite unconcerned with details or with the cogency of his proofs. His detractors moved straight into the second stage of debate - the one concerning Scriptural reinterpretation which would never be necessary until the first stage was resolved.

It is an oddity in the history of science, and one which I have not seen stated, that this first stage of assessing Galileo's findings, with reference to a Copernican or heliocentric model, was apparently never the basic problem to anyone other than Galileo. It has become clear to me that all parties involved in this dilemma had as his, or their, central issue some aspect of the debate other than the relevance or validity of the new observations, either as support for heliocentrism or as refutation of Aristotelian geocentricity.

In the following chapters I discuss in some detail a number of important and influential men who, in large or small measure, contributed to the outcome of Galileo's work. For none of them, however, were the premisses and conclusions in his writings on the astronomical findings more than a peripheral issue. In terms of logical argument on this unprecedented issue, Galileo had no opposers.

This surprising silence on what twentieth century observers might judge to be the central issue, indicates that for the seventeenth century scholars there were more relevant and important factors to be considered. In this study I have tried to elucidate what such factors might be, in the hope that a clearer understanding of them might lead to a better appreciation of the root causes of the Galileo tragedy. The present thesis may be a start in that direction.

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24. Ed. Naz. Vol. 12, Dini to Galileo, 7th March 1615.
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26. Ibid. p. 48.
27. Ibid. p. 51.
28. A. Koestler, The Sleepwalkers, Penguin Books: Harmondsworth 1969, pp. 602-607, fn. 52a.
29. B. Duhr S.J., Geschichte der Jesuiten in den Ländern deutscher Zunge, Herdersche Verlagshandlung: Freiburg im Breisgau 1913, Vol. II.2, p. 384 and 436-7.
30. Fr. Brodrick has tried to move away from the "science v. religion" interpretation, but without also moving away from the generally received history.
31. de Santillana, Crime, pp. 142-143.
32. Ibid. p. 144.
33. Koestler, Sleepwalkers, p. 449.
34. Ibid. p. 456.
35. Ibid. p. 455.
36. Ibid. p. 456.
37. Ibid. p. 456 and Ed. Naz. Vol. 12. Galileo to Dini dated only May 1615, p. 183.
38. Drake, Discoveries, p. 69.

39. de Santillana, Crime, p. 42. It should also be mentioned that there is possibility of Copernicanism being discussed among Dominicans. In September 1612, Cesi wrote to Galileo that a Dominican had defended heliocentrism in one of the debates at the Roman College, Ed. Naz. Vol. 11, Cesi to Galileo, 14th September 1612.
40. S. Drake, Galileo, Oxford University Press: Oxford 1980.
41. Ibid. p. 93.
42. Ibid. p. 93.
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CHAPTER 1Introduction

When Galileo went to the Roman College in 1611, the Jesuits were amongst Galileo's staunchest supporters; by 1615 they had withdrawn; and in 1633 his worst enemies were to be found in their ranks. Was this change simply a matter of growing animosity as it became clear how wide the difference was between Galilèò's new view of the world and the traditional Aristotelian/scriptural cosmology of the Society of Jesus?

I shall show that there was a private dialogue which persisted for many years. This dialogue had several stages and occasional disasters. It was, however, a major attempt by the Jesuits to come to terms with the new work.

In order to trace the course of the dialogue and in an attempt to understand its purposes, I have tried to read the Galilean challenge from the Jesuits' point of view.

The initial interest shown by Jesuits of the Roman College for Galileo's work, The Starry Messenger, in 1611 quickly diminished. In 1615 and 1616 during the plottings of the Caccini/Colombe faction which led to the Decree of the Congregation of the Index in 1616, no Jesuit spoke out in defence of his work. This has been interpreted by contemporary historians of science as intellectual naivete,¹ passiveness,² bad science,³ or concern not to discredit Aristotelian philosophy,⁴ on the part of the Jesuit fraternity; interpretations which, with the exception of the last point, are not supported by

the papers and correspondence of the time. These papers show too, that concern for continued adherence to Aristotle was not shared by all the brothers.

We know that, following the early telescopic observations which yielded so many discoveries, one of Galileo's first moves was to solicit the help of Vinta, the Medici's Secretary of State, in securing for him a post in the Grand Duke's household. The Grand Duke in 1610 was the elevated Prince Cosimo who had been Galileo's pupil.

It has been suggested that Galileo's desire to return to Florence was financially based, whilst in other quarters homesickness has been seen as the motive. Sagredo and Cremonini, amongst others, saw his return into Jesuit influence as foolhardy. It may be, however, that the intellectual ambience - concomitant part of all Jesuit activity - was the magnet. For full discussion of his discoveries, for debate on their implications, and for validation of his instrument and his observations, the Jesuits of the Roman College would have seemed to be the best possible mentors.

Only hindsight tells us that these men, justifiably renowned for their scholarship, would eventually reject his work after being so instructed. We shall see in Chapter 10 that a leading theologian at the Jesuit College would declare that a continued adherence to Aristotle would be the right path of Faith. But this would not be until October 1624 and right up to that time there were still certain Jesuits trying to maintain communication with Galileo on the nature of his latest work, even to the extent of promising -

albeit surreptitiously - that if his new observations warranted it there might yet be the possibility of some reinterpretation of Scripture.

On return to Florence, Galileo lost little time before visiting the Roman College, and it seems plausible that added to pecuniary interest and love of homeland, the high scholarly standing of Roman Jesuits had been an important lure.

And initially it appeared that Galileo might have been right. The welcome accorded him in Rome was highly satisfying, but not for very long.

Jesuit enthusiasm for Galileo's work was to wane completely from the high tide of adulation and promise, proffered to him by members of the Roman College on his visit in 1611. Yet it seems implausible that their intellectual interest, that thirst for new knowledge should be quenched collectively and simultaneously.

The lower and upper bounds of Jesuit interest in the possibility of heliocentrism havenot been drawn and deserve closer scrutiny, and it has seemed to me that a different method of research would be necessary to gain further insight or added dimension. To that end I have chosen to look at the Galileo affair not by asking in what ways the Jesuits affected the Florentine, but to see how Galileo affected individual Jesuits, or groups of Jesuits in the years from 1611 to 1625.

This period of time has not been chosen arbitrarily but represents the years in which, according to the correspondence, some Jesuits of the Roman College made several attempts to draw

Galileo into further discussion of his work. This was not with the intention of ensuring that he was obedient to the Decree, but in order to test the strength of any continuing work. The evidence shows that there were certain Jesuits, who were willing, even determined, to reopen dialogue with him. They made a genuine attempt to build a new synthesis, aligning some of the new astronomical observations with the accepted world picture.

The initiatory moves in these attempts, always made through a third party, ranged from the oblique to the overtly demanding. But if the Roman Jesuits were applauding in 1611, and if some of them maintained a covert interest for many years, there were others who took a different view. What could be discussed in the Roman College might not be permissible in the Catholic colleges and universities of the German States. For example some Jesuit astronomers at Ingoldstadt were personally committed to study and philosophical debate on the horror of the witchcraft trials, seeking ways for these to be conducted in a more humane and judicious manner. In these areas, bedevilled by astrological belief and witchcraft, the new astronomy could be construed as lending support to certain magic and demonic beliefs. (In Chapters 2, and 3 I will discuss this at length). In consequence a group of Jesuits from Ingoldstadt, headed by a Father Adam Tanner, pressured the General of the Society of Jesus, Aquaviva, into banning further anti-Aristotelian writings.

In the following chapters the major points are these:

1. Withdrawal of Jesuit Support from Galileo

It will be suggested that the early withdrawal of Jesuit support in 1615 was initiated by the problems of Ingoldstadt Jesuits, who

in an intellectual atmosphere far removed from that of Rome could not assimilate the new knowledge into Catholic orthodoxy. They feared that others could willingly graft it into the worlds of natural magic, lending credence to beliefs that Ingoldstadt Jesuits sought to abolish.⁵ In order to combat this possibility Aquaviva seems to have been induced to prohibit writings on Galilean discoveries by one of the brothers.⁶ His ban was against anti-Aristotelian works, but was prompted by Galileo's work, as will be shown.

2. Cardinal Bellarmine's Audience with Galileo

Cardinal Bellarmine's treatment of Galileo, both before and with regard to the Decree of 1616, seems to have been surprisingly kindly. In the letter to Paolo Foscarini,⁷ the Cardinal states the Church view of re-interpretation of Scripture, as directed by the Council of Trent, and the problem if such re-interpretation should be necessitated by a proof that the Sun is in the centre of the Universe. Nevertheless, he does accept that such proof would demand re-interpretation, and furthermore although he has no belief that such proof is existent, his "seeing-is-believing" attitude suggests the possibility that it could exist, at some future time. This interpretation of Cardinal Bellarmine's "proof" statement was certainly the one accepted by at least one leading Jesuit. At a later date⁸ Father Grassi was to say that if Galileo had proof of his helio-centric belief it might be possible to re-interpret Scripture, and he quotes Cardinal Bellarmine as authority.

In February of 1616 Cardinal Bellarmine was instructed by the Pope to convey the decision concerning the Copernican hypothesis

to Galileo. There are four documents relating to the meeting when Galileo heard the decision from the Cardinal. They have caused much controversy among historians in this century and one of these documents formed an important part of the accusations against Galileo at his trial in 1633. I append them herewith, naming them Documents 1 to 4 for ease of reference within this thesis. Documents 1 and 2 are entries in the Inquisition file.

Document 1

Thursday, 25th February, 1616. The Lord Cardinal Mellini notified the Reverend Fathers, the Assessor, and the Commissary of the Holy Office that the censure passed by the theologians upon the propositions of Galileo - to the effect that the Sun is at the centre of the world and immovable from its place, and that the Earth moves, and also with a diurnal motion - had been reported; and his Holiness has directed the Lord Cardinal Bellarmine to summon before him the said Galileo and admonish him to abandon the said opinion; and in case of his refusal to obey, that the Commissary is to enjoin on him, before a notary and witnesses, a command to abstain altogether from teaching or defending this opinion and doctrine and even from discussing it; and, if he do not acquiesce therein, that he is to be imprisoned.⁹

Document 2 There follows on the same page in the Inquisition File:

"Friday, the twenty-sixth. At the palace, the usual residence of the Lord Cardinal Bellarmine, the said Galileo, having been summoned and being present before the said Lord Cardinal, was, in

presence of the Most Reverend Michelangelo Segizi of Lodi, of the Orders of Preachers, Commissary-General of the Holy Office, by the said Cardinal, warned of the error of the aforesaid opinion and admonished to abandon it; and immediately thereafter, before me and before witnesses, the Lord Cardinal being still present, the said Galileo was by the said Commissary commanded and enjoined, in the name of His Holiness the Pope and the whole Congregation of the Holy Office, to relinquish altogether the said opinion that the Sun is the centre of the world and immovable and that the Earth moves; nor further to hold, teach, or defend it in any way whatsoever, verbally or in writing; otherwise proceedings would be taken against him by the Holy Office; which injunction the said Galileo acquiesced in and promised to obey. Done at Rome, in the place aforesaid, in the presence of R. Badino Nores, of Nicosia in the kingdom of Cyprus, and Agostino Mongardo, from a place in the Abbey of Rose in the diocese of Montepulciano, members of the household of said Cardinal, witnesses".¹⁰

Document 3 In 1849 the archives in Rome were, unexpectedly and briefly, available for inspection. During this period Gherardi discovered the following minutes for a meeting on March 3rd 1616 among the Decreta of the Congregation:¹¹

"The Lord Cardinal Bellarmine having reported that Galileo Galilei, mathematician, had in terms of the order of the Holy Congregation been admonished to abandon the opinion he has hitherto held, that the Sun is at the centre of the spheres and immovable and that the Earth moves, and had acquiesced therein; and the decree of the Congregation of the Index having been presented, prohibiting

and suspending, respectively, the writings of Nicolaus Copernicus, of Diego de Zuniga On Job, and of Paolo Antonio Foscarini, Carmelite friar - His Holiness ordered this edict of prohibition and suspension, respectively, to be published by the Master of the Palace".¹²

Document 4 During the weeks following the Decree of March 1616, concerning the Copernican doctrine, rumours grew to the effect that Galileo had been humiliated and punished and he asked Cardinal Bellarmine for a certificate on the true state of events. Cardinal Bellarmine replied as follows:

"We, Roberto Cardinal Bellarmino, having heard that it is calumniously reported that Signor Galileo Galilei has in our hand abjured and has also been punished with salutary penance, and being requested to state the truth as to this, declare that the said Galileo has not abjured, either in our hand, or the hand of any other person here in Rome, or anywhere else, so far as we know, any opinion or doctrine held by him; neither has any salutary penance been imposed on him; but that only the declaration made by the Holy Father and published by the Sacred Congregation of the Index has been notified to him, wherein it is set forth that the doctrine attributed to Copernicus, that the Earth moves around the Sun, and that the Sun is stationary in the centre of the world and does not move from east to west, is contrary to the Holy Scriptures and therefore cannot be defended or held. In witness thereof we have written and subscribed these presents with our hand this twenty-sixth day of May 1616".¹³

The first problem for historians, with regard to these documents, is the discrepancy between the instructions to Cardinal Bellarmine,

as shown in Document 1, and an account of the proceedings as outlined in Document 2.

In Document 1, Cardinal Bellarmine was bidden to admonish Galileo to abandon the Copernican opinion of heliocentrism. In the case of Galileo's refusal to obey, the Commissary (the Most Reverend Michelangelo Segizi, of the Order of Preachers) was to take certain action as outlined in Document 1. Document 1 is an entry in an Inquisition file and is followed on the same page by the entry which I have called Document 2, which records the meeting in which Cardinal Bellarmine was to admonish Galileo as instructed.

In Document 2 it is recorded that such admonishment was given by Cardinal Bellarmine and then , although no record is made of demur or refusal by Galileo, Segizi commanded Galileo to relinquish altogether the Copernican opinion and told him he was not to hold, teach, or defend it in any way whatsoever, otherwise proceedings would be taken against him by the Holy Office. The record continues by saying that Galileo then acquiesced and promised to obey.

The discrepancy raises more than one question: at what stage of the proceedings did Galileo acquiesce, before or after intervention by the Commissary-General? Also, why - since there is no record of refusal by Galileo to accept the decision made known to him by Cardinal Bellarmine - was it necessary for Segizi to add anything to the proceedings? Documents 3 and 4 do not suggest that Galileo refused to abandon the Copernican view, when so requested by Bellarmine.

Document 3 states, specifically, that Cardinal Bellarmine had reported that Galileo "had acquiesced therein".

Document 4 is a letter which Cardinal Bellarmine wrote for Galileo, at Galileo's request, to confirm only that "the declaration made by the Holy Father and published by the Sacred Congregation of the Index has been notified to him" ... (that the Copernican opinion) ... "cannot be defended or held". This certificate, or letter, was intended to be used by Galileo to show that he had not abjured nor received punishment, as rumour would have it.

Documents 3 and 4 suggest that the procedure outlined in Document 1 was followed correctly: Cardinal Bellarmine admonished Galileo to abandon the Copernican opinion and that he acquiesced. Further proceedings by Segizi being unnecessary, they would be out of order.

What then can be said about Document 2?

Our leading historians of science are agreed that the entry in the Inquisition file concerning Galileo, dated Friday 26th February, and listed as Document 2 in this thesis, is unorthodox; no notary has signed it, there are no official witnesses, and its location within the file is not according to standard procedure.¹⁴ It may have been prepared in advance of the audience, in the belief that Galileo would be obstinate in the face of the Cardinal's admonishment, thus calling into play the second stage of the instruction issued on February 25th. A second stage, if it became necessary, would require the Commissary-General to serve the injunction "to abstain altogether from teaching or defending this opinion" upon pain of imprisonment.

It may be a true record, which would then bring doubt on Documents 3 and 4.

Santillana's description of the actual file indicates that this unsigned minute could have been written in at a date other than the 26th February.¹⁵ That is, before the audience, shortly afterwards, or even several years after that event. It was found when the file was scrutinised at the time when the trial of Galileo was being prepared in 1633. In that trial it was to be a very important piece of evidence.¹⁶

There have been many issues raised by comparing these documents. For more than a century historians have debated what actually happened and have put forward varying hypotheses. However, there still remains considerable uncertainty as to the true state of affairs. What is certain is that at the trial of Galileo the Inquisition entry, (named Document 2 in this chapter) was accepted as true. The section where Segizi is reported as having instructed Galileo not to hold, teach or defend the Copernican hypothesis, in any way whatsoever, verbally or in writing, was a crucial point for the Reverend Doctor Carlo Sinceri, Fiscal Procurator, in his questioning of Galileo.

Did Galileo remember those words? the Procurator asked. Galileo said that he did not recall them, he recalled only the voice of the Cardinal Bellarmine, and offered in support of this the affidavit by Bellarmine (Document 4).¹⁷

This letter written by Cardinal Bellarmine, at the request of Galileo, suggests the intention to deal as kindly and as fairly with Galileo as possible and yet to remain within the precise limits of the situation.

I will show that in many ways Galileo's problems in 1616 mirrored the Cardinal's own tribulations in the last decade of the sixteenth century. At that time when the Cardinal himself was exploring and expounding new avenues of Catholic thought his own major four-volume work was put on the Index; ¹⁸ some fellow-feeling for Galileo and a curious similarity in some aspects may account for his particular handling of the Decree of 1616.

3. Jesuit Overtones

The comet of 1618/19 stimulated a return by certain Jesuits to discussions concerning the nature of the heavens. Fr. Grassi of the Roman College spoke on the comet and published a paper, which was to be the beginning of a debate between him and Galileo, although part of Galileo's views were proffered by Mario Guiducci in a paper issued in Guiducci's name. Favaro has shown that the manuscript of the Guiducci paper was almost wholly in Galileo's hand, ¹⁹ but study of the relevant material indicates that Guiducci did a great deal more than lend his name. It seems certain that the larger motive of Guiducci, possibly at the instigation of Roman Jesuits, was to induce Galileo to reply to the first paper of Fr. Grassi.

A close study of the comet papers ²⁰ and the Galilean correspondence shows that an hitherto unsuspected part was played by Mario Guiducci. Nurtured in his youth by Roman Jesuits, he continued throughout his life to be regarded as 'one of themselves'. He visited the Roman College regularly, and was on terms of filial affection with leading members, and yet at the same time maintained a close

and increasingly strong friendship with Galileo, visiting his home with equal regularity.

The correspondence shows that from 1619 to 1625 Guiducci was an intermediary in Jesuit attempts to learn from Galileo what new work, if any, he was producing. The correspondence for the years prior to 1619 throws no light on the early stages of the friendship, but various references in the later letters suggest that Guiducci was introduced into Galileo's circle as early as 1614, a time when the public interest of Jesuits in Galileo's work was being steadily withdrawn.

When Aquaviva was succeeded by Vitelleschi in 1615 as General of the Society of Jesus, a programme of intellectual expansion was requested by Vitelleschi.²¹ The comets of 1618 seemed to be a natural topic on which to re-establish dialogue with Galileo, with Guiducci, securely ensconced in Galilean favour, the obvious person to re-open discussion.

As a result of Jesuit prodding and Guiducci's cajolery a dialogue commenced, but one rather different from what had presumably been the intention of Fr. Grassi. The details of this surveillance and its consequence will be explored in full.

4. Spinola's 'Decree'

If, as I shall show, neither Aquaviva's demurs nor the 1616 Decree had entirely suspended Jesuit interest in Galileo, but had merely sent it underground, there was to be a time and an event which would finally sever any last hope of collaboration, and this

severance would occur in 1624, in a lecture - or course of lectures - given by Jesuit Father Spinola.

Fabio Ambrogio Spinola was born in Genova in 1593. At 17 he entered the Society of Jesus and later taught philosophy and sacred Scripture in the Gregorian University in Rome. He died in Genova in 1671, and it is useful to note that he entered the Society at the height of Jesuit interest in Galileo's work and at a time when some members were beginning to see inconsistencies in the Aristotelian cosmology.²²

Spinola does not play any role in this work other than that his presence is noted at a meeting of the Accademia dei Virtuosi (Chapter 7) and that he appears to be the channel through which the Society restated its total adherence to the pre-1610 Aristotelian cosmology, thus excluding any accommodation for the Galilean discoveries. This came about in the following manner:

In 1624, through Guiducci, Fr. Grassi was to amplify the suggestion made so tentatively by Cardinal Bellarmine in a letter to Paolo Foscarini in 1615. If Galileo would offer demonstration of the movement of the Earth, he, Grassi,

"might agree to interpret the Sacred Scriptures in other ways".²³

But for the main body of the brotherhood, as indeed for the Catholic Church, 1624 was not the time of enlightened emancipation. Security, strength and continuity were thought to reside in the beliefs and adherence which had carried them into positions of power.

Within days of Fr. Grassi's private suggestion of possible reinterpretation of Scripture, Fr. Spinola, Professor of Theology in the Roman College, mounted a series of lectures. Their importance can be understood by the invited audience, which contained high ranking theologians and prelates, and the message was a total return to strict adherence to Aristotelian principles. This is detailed in the penultimate chapter.

The dialogue had never really started between Galileo and the Jesuits, but now even the attempts were destroyed. Further discussion was ruthlessly and utterly finished.

These are the major points on which this work is based. There will also be minor points introduced which will indicate that Galilean research is still a fertile area.

CHAPTER 1 - References

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"Above all it was a magical world, a world of neo-Platonist 'natural' magic, whose philosophers looked beyond the multitudinous visible phenomena of nature and found a vast system of divinely ordered harmony, discoverable by research, intelligible by human reason, operable by the adept, the magus. This magical world repudiated the formal cosmology of medieval Christendom, and transcended the sectarian differences between orthodox Catholicism and orthodox Protestantism, both of which had returned to that cosmology. At its core it was ecumenical, tolerant, contemplative, scientific; at its periphery, it ran out into alchemical fantasies, astrological calculations, Pythagorean numerology."

It was this peripheral use of Galileo's work that the Ingoldstadt Jesuits feared, whilst it was for the "ecumenical, tolerant, contemplative, scientific" possibilities that some of the Roman College Jesuits returned to his work again and again.

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CHAPTER 2Adam Tanner

A particularly intriguing aspect of the Galilean story is the recurring pattern of initial euphoric acceptance of his work, and then withdrawal of favour as the inherent problems of his anti-Aristotelian statements became more apparent.

We saw this in the triumphal reception for Galileo at the Roman College in 1611, and the subsequent diminution of Jesuit interest in the following two or three years.

At the Catholic University of Ingoldstadt news of Galileo's discoveries were greeted with enthusiasm by the Jesuit teachers Adam Tanner and Christopher Scheiner, and yet they were shortly to reject his work formally, although in differing ways.

Several years later Galileo's The Assayer, of 1623 was praised and applauded strongly by the new Pope Urban VIII, and his further work encouraged, only for him to face closed doors and Papal disregard within two years.

These three apparently disparate sets of events are not unconnected, as I shall show, and in fact in the first two are indicative of major political struggles within the Society of Jesus. Intellectually Jesuits could rejoice at the telescopic revelations. These new astronomical discoveries were initially regarded as stimulating information which could enhance the already famous scholarship and teaching at the numerous Jesuit educational establishments, in Europe, the New World and in the East.¹ From la Flèche² to

China,³ Jesuit teachers were willing to convey the contents of The Starry Messenger to their students.

And yet it was quickly realised by some of the brotherhood that the implications of the new cosmology threatened the rigidly framed Aristotelian world. In the Europe of the Counter Reformation period, this was a disturbing possibility, and in the event the requirements and needs of the Jesuit programme for Counter Reformation were given priority. For several reasons, a continuing attempt at a unified world picture was deemed essential by those Jesuits working in the lands of the old Holy Roman Empire.

The political, theological and social problems which faced these men were so numerous and their interaction so complex, that the advent of Galileo's methodology and a new cosmology could not be assimilated. His troubled career was largely a consequence of rejection by Ingoldstadt Jesuits following The Starry Messenger and Letters on Sunspots. In the latter publication Galileo was at pains to show that the conclusions of Jesuit Christopher Scheiner on sunspots were untenable and this, together with a dispute between them concerning priority in sunspot observations, caused lasting bitterness. Behind Scheiner, however, there was a less obvious group of Jesuits deeply concerned with their own intellectual programme. It was a programme aimed at diminishing, if not destroying, the hold that astrology and magic had on the minds of men in the German and Bohemian lands.

This group, of which Adam Tanner was an outstanding member, was part of an early enlightenment movement, and they were the ones

who sought to restrain acceptance of Galileo's work, by appeal to the leader of their Order, Aquaviva.

There is no doubt that at first sight many Jesuits were delighted with The Starry Messenger of 1610. It was then, as now, compelling reading, easily understood and very persuasive in style. According to one contemporary correspondent, concerning the visit by Galileo in 1611, to the Roman College,

"unbelievers (in the discoveries) were being converted one after another".⁴

Fathers Grienberger and Clavius had been induced to use the new telescope and were able to support Galileo's findings.

Cardinal Bellarmine had been assured of the soundness of his work and the Pope received him in audience. There were, of course, many who did not share either enthusiasm for, nor belief in, the new work, but for a short time they were overlooked as Galileo's fame spread beyond Florence and Rome.

This early stage of positive response to the Galilean work soon evaporated and indeed its reception at Ingoldstadt, again with initial delight, was followed by what seems to have been the first major rebuff from the Society of Jesus. It was to be a rebuff with devastating consequences, for the man and for his work.

At Ingoldstadt Father Christopher Scheiner, the renowned astronomer, and Father Adam Tanner, Professor of Scholastic Theology, both Jesuits, were close colleagues who studied and conferred together on works of natural philosophy and theology.

Tanner delighted in the telescope and its possibilities and

on seeing the sunspots for the first time ⁵ is reported as being

"pleased as a child, crying to his fellows to consider the wonderful spectacle". ⁶

They collaborated in a variety of observations and Tanner, writing of their work, advises the addition of dark blue lenses to the Galilean equipment when viewing sunspots. ⁷

The sunspot work, however, forced them both towards a dilemma. Staunchly Aristotelian as Jesuits, they faced the problem that the continual renewal of sunspots was at the very least suggestive of changeable Heavens. Tanner, intimating that he was caught between the deep reverence for the ancient teachers inculcated in him by his years in the Society and his continuing desire to understand natural phenomena, abandoned the observations. At this point it was not a matter on which he was being forced to decide and his attitude, one which Cardinal Bellarmine might have approved, became that of one who had time on his side in the matter of a new astronomy. There could be further observations, other explanations. He retained his Aristotelian stand. It will be shown later that there were aspects of the work which Tanner viewed with greater concern.

This was not the case with Father Scheiner who as an astronomer and mathematician felt impelled to continue the work, issuing his findings as a series of letters to Mark Welser under pseudonym. These letters, of course, were the ones relayed to Galileo, whose subsequent replies were published as History and Demonstrations Concerning Sunspots and their Phenomena, in Rome in the year 1613.

In his history on sunspots Galileo had been openly Copernican, using his observations to argue for a heliocentric universe.

Following his own observations of sunspots in collaboration with Father Tanner, Scheiner was causing concern amongst his colleagues at Ingoldstadt. He was publicly arguing for the untenability of Aristotelian premises,⁸ and possibly had some intention of publishing further material in the debate. In December 1614, Father Tanner on behalf of himself and a group of colleagues, felt it necessary to appeal to Aquaviva, the General of the Society of Jesus, asking that Scheiner should be curbed.⁹ Aquaviva replied that he had, in fact, already reminded Father Scheiner a few days earlier to give up the new opinions of the Heavens. This was not as a result of Adam Tanner's intervention, but rather of Scheiner himself having submitted a request that in a new edition of his writings on sunspots he should be allowed to add his name.

Earlier than this Aquaviva had instructed Scheiner that in order to keep the Jesuit name from this area of possible sensitivity he must not publish work in his name. The Appelles pseudonym seems to have been the result.

Now, with the possibility of the new publication Aquaviva informed Scheiner that he must maintain the name Appelles. In particular Father Scheiner was instructed to bring up no new hypothesis concerning the fluidity of the Heavens or about the stars.

"may I recommend your Reverence that you depend on the solid teachings of the ancients and avoid new opinions of certain innovators. Be convinced that to us such are very displeasing and we will¹⁰ not tolerate the promulgation from one of us".

The "certain innovators" were undoubtedly Galileo and those who applauded his work, and there was clearly a grave doubt in the

General's mind about Scheiner's intention to obey, despite the rule of total obedience. Accordingly he wrote on the same date, December 1614, to Hartel, Head of the German Province, reiterating his statement about the new opinions and requesting Hartel to ensure that Scheiner did not publish any account.

This time Father Scheiner obeyed completely, evidently discontinuing his work entirely, so much so that in 1618 Vitelleschi, the successor to Aquaviva, wrote from Rome urging the astronomer to resume his studies.¹¹

With Vitelleschi as the new Vicar General there were subtle changes in the Jesuit scholarship. He emphasised that there was new work to be done in natural philosophy even while staying within the limits of the Aristotelian belief, and he encouraged the movement against astrology.

Adam Tanner and Christopher Scheiner, alert and enthusiastic scholars, were typical members of the higher echelon of intellectual Jesuits with whom Galileo might reasonably have expected interaction and debate on natural philosophy, and his own contribution in particular. From the correspondence already noted we suspect that Scheiner, without Tanner's intervention, was willing to enter into such discussion. Scheiner was apparently turned away from Galileo's work by Aquaviva's instruction, while Tanner withdrew of his own volition.

At the time of the observations he had made with Scheiner, and their discussion of Galileo's work, Adam Tanner was already immersed in intellectual problems which to him were of higher order

than the new astronomy. Can we decide whether his excursion into the Galilean realm was a temporary diversion and that he may have felt no urgency to solve the problems inherent in the new cosmology, or, as is the more probable, did he see in the new discoveries factors which would add to the complexity of his own studies? For many years he and others had wrestled with problems which urgently demanded solution. An analysis of them may go a long way towards explaining part of Galileo's troubles, and giving some understanding of the Society's difficulties at this period.

Tanner, born in 1571, a man of similar age to Galileo, joined the Society of Jesus in 1589, and at first glance he would appear to be not dissimilar to Galileo in many of his thoughts and methods. He believed in natural explanations and the value of experiment.

In 1610 in a religious debate at Ratisbon between Catholics and Lutherans, Tanner aided his fellow Jesuit Jacob Gretser in proving that the dead word of the Bible could not be the supreme arbiter in matters of faith, and a year later he published details of the proceedings.

For Tanner there were always

"many countless effects in nature which we experience, whose causes we are either ignorant of or consider so great that we cannot pass any judgment on - we have no experimental evidence".¹²

This and similar statements by Tanner will remind us of Galileo, with one important difference: Galileo used experiment to establish mathematical relationships in nature, whereas Tanner's use of experiment was a means of categorising phenomena in nature.

Between the realms of miracles and unexplained events attributable to God's intervention, and events and effects purportedly produced by demonic magic or occult arts, lay a world of nature or natural magic. It was the bounds of this world which Tanner sought to delineate, to establish a bridge of natural but little understood effects to separate the divine from the arcane.

The Catholic world was required to accept the possibility of demonic intervention for to deny it was, in effect, to deny the entire spiritual world on which the Church rested. So they must believe in magic and witchcraft, but not practice.

In the wake of the Counter Reformation, which moved with some success across the Protestant areas of Europe, the leading Catholic Orders became the target for every criticism and invective which the Protestant side could muster. True or false, any and every discreditable statement was issued against them and in this onslaught of words and abuse the Jesuits were the major target.

The educational programme of the Jesuits, by means of which they gained entries over many years into the leading households of principalities and dukedoms, both Catholic and non-Catholic, was seen to be the corner-stone of the reconversion gained by the Society of Jesus. In their colleges and schools the Jesuits were already firmly installed, often in the midst of their enemies.¹³

To combat this prime vantage point the Protestant theologians, writers and scholars were united in inciting a wave of loathing and revulsion against the Catholic Church and its militant Orders. Accusations were made of demonic magic acts, of invocation and spirit raising.

Protestant antagonists like Wier,¹⁴ Erastus¹⁵ and Agrippa¹⁶ and many more, had derided the devotional practices of the Church as darkly magical, and the efforts of leading Catholic theologians had been directed throughout the sixteenth century towards illustrating the essential differences between sacramental rituals and magical incantations.¹⁷ Without the initial act of faith, wine into blood, bread into flesh, religious medals and saintly relics were on a par with transmutation of lead into gold, magic amulets and potions, and demonic compact.

The special emphasis placed by Jesuits on sensual appeal in their religious practices rendered them peculiarly vulnerable to such charges. In reply to the Protestant writers they fielded many eminent defenders. Bellarmine, Maierhofer, Del Rio, with differing emphases and modes of attack were prolific writers in this war of words, during the last decade of the 16th Century, each with an influence lasting well into the 17th Century. Del Rio wrote specifically on the problem of distinguishing devotional practice from magic, his work being published first in 1599 with many editions, and was regarded as an authoritative view by Catholics.¹⁸

About this time, or shortly afterwards, Adam Tanner became involved in this large and important issue of categorising magic and belief. Del Rio, renowned Jesuit and scholar, had believed in a good prisca magia descending from Adam,¹⁹ or natural science,²⁰ and this seems to have been Tanner's starting point. But if Tanner used some of del Rio's views as a foundation, he moved surely and steadily into opposition on the issue of witch-hunting, so that

on this one point he was actually closer to the Protestant Wier.²¹

In 1586 Wier had published an

" 'address to Emperor, Kings, Princes, and Judges, secular and ecclesiastical" invoking their attention to removing from Christendom the disgrace of aiding the devil in his efforts to throw upon crazy old women this charge, and cause such slaughter, while enforcing the just law against magicians".²²

Wier believed that the hundreds and thousands of women who were victims of the witch-trials and burnings were simply deluded human beings caught up in the furore of the times, and that acts and effects of magic could not be attributed to them.

Although he never made the outright declaration that witchcraft itself was delusion, Adam Tanner came to share Wier's view which, at this time, was highly controversial. It was the period when men like del Rio could argue that "to deny witchcraft is atheism" and is "contra fidem",²³ and when the view that "to disbelieve in witchcraft is the greatest of heresies" was firmly established.²⁴

When Tanner first looked at the work of Galileo, he himself had become closely involved in a personal investigation into the magic of Trithemius. By 1616 following several years of painstaking and penetrating scholarship he had laid the foundations for the ideas and analyses which were to form his major works and writings centred on magic and witchcraft. His attempts to halt the ever-increasing witch-hunts indicate that he was part of a "pre-enlightened" group, some within his Order, some outside. Enlightenment or liberal thought was not, however, what the Society asked for at that period. His involvement with the Trithemius work caused

many of his confrères to identify him with the magician, a dangerous state of affairs for Tanner.

The late 16th Century and the early years of the 17th Century had seen a burgeoning of interest in magic, astrology and the occult arts, among all levels of society within the loose compact of lands and principalities in the Emperor Rudolf's domain.

Adam Tanner's formative years coincided with the reign of the Emperor, both chronologically and geographically, and the effects of the Rudolfine milieu were both seen and felt by the Jesuits of Ingoldstadt. They were very close to the miseries of the people and they knew of the adverse effects on minds and souls from these bizarre influences. Combatting erroneous beliefs about the nature of magic and of witchcraft would be an essential part of these Jesuits' Counter-Reformation programme.

The Bull of 1586 of Sixtus V ²⁵ forbade the practices of astrology, divination and many forms of magic and condemned the possession or reading of books on such matters, and in Italy the Bull seems to have been increasingly well observed. ²⁶ In the German states and in Bohemia, however, the reverse was true where, possibly due to the influence of Rudolf, all manner of magical practices, astrology and occultism were increasing.

At the court of the Emperor, philosophers and magicians, scholars and astrologers, were welcome, and they travelled to Prague from across Europe and from Asia, to form a multi-lingual, multi-disciplinary, multi-religious society, in which genuine scholarship, magical incantations and differing theologies were intermixed and interdependent.

There can be little doubt that Jesuits in the North German and Bohemian lands were influenced in many ways by this pervading credulity in matters of magic. When Tanner, for example, studied Trithemius, there were confrères ready to brand him 'magician' which if accepted would have earned him severe penalty. And at one stage of his work in defence of those unjustly accused of witchcraft, the inquisitors declared that Tanner himself should be burned.²⁷

And yet it seems that other of his brothers may have shown an unhealthy interest in the art of magic and prediction. Certainly Pope Clement VIII found it necessary in 1596 to rebuke the society for continuing to read prohibited books.²⁸ In 1595 the Congregation of the Index had cancelled all permits, for reading prohibited books, which had issued from any authority other than the Congregation of the Index or the Pope. Increasingly books of occult arts, astrology and magic were being perused; the Congregation of the Index sought to restrict this by limiting the source of permission. Nevertheless Pope Clement reiterated this command to the Jesuits, who had framed their own interpretation of the 1595 restriction, and it was stressed to them that the fathers could not use prohibited books even if corrected by themselves.

There is, too, much evidence of the growth of a prophetic cult within the Society. Part of the prevalent self-image of Jesuits as the chief mediating Order between man and God and as crusading army against Protestant heresy²⁹ stemmed from a widespread acceptance within the Society of the Joachimite prophecies and predictions.³⁰

The Abbot Joachim, in the 13th Century, had predicted the

emergence of three monastic orders which would combat different stages of heresy. The first two of these had been identified with the Orders of St. Francis and St. Dominic. In the late 16th Century there was belief among Jesuits that their society was the predicted third and major Order, which would do the last great deeds before the Church entered the stage of its greatest glory. For the most part, they were modest enough not to claim this for themselves publicly, but did not protest too strongly when it was said of them.³¹

This prophetic cult appeared in many regions of the Society and it flourished too in the Emperor's domain. Evans sees this as part of a resurgence of willingness to indulge in secret and unorthodox currents of thought, in the areas of RudolFINE influence.³²

As a specific example of the moulding power of the Emperor's regime, the Jesuit Pontanus is worth noting. He was an intellectual of repute, firmly identified with the Society's Counter-Reformation efforts, and a welcome personage at court. His library, much of which is still held at Strahov, shows the global nature of his interests and thinking.³³ Evans, lists, among others, Porta's Magia Naturalis, works by Cardan, de Beodt on gems and magic stones, and a variety of books of the occult genre.

In all areas touched by these influences, the Faith was at risk, and the reconversion doubly difficult. For the Jesuits of the German Province this was an enormous problem, and bedevilled as the area was by recourse to magical practices and superstitious beliefs, it had long been a cause at Ingoldstadt to distinguish and elicit phenomena which properly belonged to the field of natural

philosophy from the welter of witchcraft and wizardry. As early as 1581, eight years before Tanner joined the Society Father Matthias Maierhofer S.J., of Ingoldstadt had debated and written on this subject. His paper A philosophical disputation concerning the principles of discerning true and more recondite philosophy from infamous and superstitious magic, had laid a foundation at Ingoldstadt for a continuing study.³⁴

Thorndike has shown us that a basic premise of Maierhofer concerning natural magic was that it "is the application of true and natural causes to produce rare and unusual effects by methods neither superstitious nor diabolical. It is (that is natural magic) subordinate to natural philosophy but is not the same thing".³⁵

This was an acceptable view in many quarters, and yet the key words "true" "natural" "cause", "superstitious" and "diabolical", escaped close definition, and generated countless theses and papers of exploration,³⁶ debate and disagreement for many decades. Father Maierhofer proposed some fifty five theses concerning cause alone.³⁷ At this same period Robert Bellarmine then Professor of Controversial Theology at the Roman College was engaged in his series of lectures which would become his major work³⁸ and in which he explored the extent and limits of the knowledge attainable by human intellect. (His work will be discussed in Chapter 4).

This was the area of study, already occupied by some of the most illustrious European scholars, which Tanner chose to enter. Remembering his location in those years of pseudo-truce, ridden with religious controversy and with the prevailing search to control

events through magical or astrological means, his choice had an element of inevitability. Using the methods of philosophy, logic and experiment he studied and examined the areas of natural knowledge, natural magic and superstition. And as part of this examination he showed initial interest, and eventually an undue interest in a proposed vindication of Trithemius, erstwhile Benedictine Abbot of Sponheim. Martin Luther in his "Tischreden" had written of Trithemius as "the magician and wizard who had conjured up the ghosts of the nine best Emperors for the Emperor Maximilian by devilish arts".³⁹ And for a hundred years Trithemius' name was notorious for all forms of magic, diabolic arts and conjuration of spirits. This was the man Tanner would defend. We know of his role in urging the abatement of witch persecutions and in 1626 he published a major work, Universa Theologia Scholastica. This book contained all the statements and propositions against witch-hunting and the infamous trials which Spee⁴⁰ would use in his crusade against the burning and torturing of those accused of witchcraft.

Tanner's study and defence of Trithemius seems to have been his first public venture on this issue, and his method of work was to show Trithemius not as a wielder of magic arts, but as one who possessed knowledge of little known but repeatable effects. I have noted earlier that Tanner, although he spoke out against the witch-hunts, never denied the possibility of witchcraft and magic. Here at the earlier stage of his career when he worked through the books of Trithemius it appears that he was hoping to destroy the theory of the witch-persecutions.

There was at Ingoldstadt a fellow Jesuit, Georg Stengel, whose brother Karl (a Benedictine) was engaged in writing a history of his own Order and of its saints. Karl had studied philosophy and theology at Ingoldstadt in 1596/7, making many lasting friendships among the Jesuit fraternity, particularly with Jacob Gretser,⁴¹ and at a later stage the younger brother Georg became secretary to Gretser and editor of his writings.

Karl was domiciled in Augsburg and from the correspondence between the brothers, Durrwachter has shown us the steps by which Adam Tanner moved from general interest in the vindication of Trithemius to becoming its major contributor and final author.

Although known in manuscript for many decades the notorious Steganographie⁴² of Trithemius was not published until 1606. And in the event its printing was a daunting task, as a large part of the work comprised secret writing, cabalistic invocations and a variety of hieroglyphics. In his lifetime Trithemius was denounced as a wizard trafficking in demonic arts and, although he sought to defend himself, he wisely refrained from publishing his writings.

It was the thesis of Karl Stengel, and later of Tanner, that a translation of Trithemius' work would show it to be an investigation into apparent magic effects, illustrating that all had natural causes.

In their contention, Stengel and Tanner were seeking to refute generations of renowned scholars who had denounced the work. Martin Luther, Johann Cambilhon, Charles Bouvelles, Martin del Rio the leading Jesuit expert on the occult, and Jacob Gretser were among

the many, both Catholic and Protestant writers, who declared the Steganographie to be a work of dangerous sorcery.

For the Jesuits however, it was worse than this; Johann Cambilhon, notable Protestant protagonist, in denouncing the Steganographie had declared that it was used by the Society of Jesus as a text book for initiating its novices into sorcery.⁴³ It was a defamation that the Jesuits could not counter, in spite of denial. It can be no surprise then, that when Adam Tanner chose to defend Trithemius, there were those in his Order who saw his work as lending support to Cambilhon's earlier accusations.

Jacob Gretser, denounced the Steganographie after its first publication in 1606 and he insisted that the Catholics wanted nothing to do with the book, declaring that the Protestants had published it and those responsible were themselves its disciples.⁴⁴ And, indeed, Catholic theologians wanted so little to do with it that in September 1609, following their fervant requests, it was placed on the Index, members of the Society of Jesus requesting this suppression, particularly.

From 1609 until late 1614, the brothers Stengel and Adam Tanner worked hard to solve the different sections of the works with their variety of codes and ciphers. Jacob Gretser meanwhile wholeheartedly disapproved of the venture, constantly warning them of its dangers and urging them to discontinue their efforts. By mid 1612 Tanner was doing the major share of the work and the proposed vindication seemed by now to be wholly his own project, although still with help from the Stengels.

What motivated Adam Tanner to continue this work for so many years is hard to understand. The actual deciphering itself, can of course be seen as a puzzle-solving situation of the highest order, its allusions and symbolism would bring its own pleasures and rewards. We know too of his determination to erode the theories of the witch-hunters and his hope to alleviate the sufferings of those accused. But his continuation of the project for so long, in face of vehement opposition from within his Order, suggests that he was deeply interested in magic and its connection with natural philosophy.

In his work with graduands he investigated new ideas and discoveries, he was a notable teacher and he referred repeatedly to experiment as the source from which he had learned irrefutable truths.⁴⁵

He had an enlightened attitude both in his determination to look for natural explainable causes and in the way he could override some aspects of the intellectual restrictions of his time and training. And yet he had a measure of ambivalence.

There were some events which he would not categorise as following the course of nature, earthquakes and comets being of this order. But he also denied their supernatural significance, thus leaving them in a kind of limbo, presumably available to some form of control which he could not classify. The plethora of new stars in Tanner's lifetime,⁴⁶ and before the advent of the telescopic work of 1610 and later years, caused great consternation to all.

If Tanner was unsure of their place in nature and doubtful of their origin, other thinkers placed them firmly in the diabolic area, and the proliferation of such events produced ever growing consternation and fears, which in turn yielded larger numbers of accusations and charges in the unquenchable witch fever.

We shall see that with the appearance of the 1618 Comet there was a Jesuit attempt to fit comets firmly into the realm of nature, an attempt which would involve Galileo in protracted dispute with the Society.

There is no doubt that Tanner's investigation into magic was of a prolonged and determined nature, with some degree of experimentation.⁴⁷

He was convinced of the innocence of Trithemius but it is not known - nor any suggestion given - how such conviction was derived. Until Tanner himself decoded the works, all noted writers had declared them to be works of diabolic magic. Agrippa of Nettesheim did much to establish this view by his open avowal of collaboration in occult arts.

Tanner's long involvement with the Trithemius work was potentially physically dangerous to him, in many ways. The wish of some of his colleagues that he be accused of being a magician was a serious matter. So too was the matter of working with a prohibited book. Following the special instruction to Aquaviva that Jesuits must follow the new rule that only the Pope could grant permission to read works on the Index, Tanner should have had such special licence. I cannot trace that such permission to study the Steganographie was given.

Both Miss Frances Yates⁴⁸ and Lynn Thorndike⁴⁹ see Trithemius' Steganographie as a source for some of Giordano Bruno's theories. Bruno was familiar with works of Trithemius, Paracelsus, Agrippa and Cardan, and was influenced by them in his own writings. The possibility of connections between Trithemius' thought and Bruno's should have sounded clear warnings to Tanner.

My own view of Tanner, who lived and worked in the ambience of the Rudolfine Renaissance, is that he had a definite belief in the possibility of a working natural magic and this launched him into his investigation. A fervent curiosity and wish to acquire secret lore kept him working. He told in his Astrologia Sacra⁵⁰ how in collaboration with a friend he tested the hitherto hidden instructions of the Steganographie for communication over distances; a communication without words, letters, or messages, in a purely optical or acoustic manner.⁵¹

It seems probable that such promised secrets were the lure for Tanner as for so many of those scholars in the Rudolfine milieu. His determination to show the innocent content of the work can be seen as an attempt to vindicate his own involvement, and certainly the Society could have been expected to be relieved if a commentary on the Steganographie could show it to be freed from the suspicion of demonic magic; in that way the slander to the Society that it was used to instruct Jesuit novices in magic might be negated. Tanner's continued belief in the innocence of Trithemius could be viewed in this light.

The appearance of Tanner's completed apology for Trithemius

supports this view. On February 9th, 1615 it had already been read by Georg Stengel and forwarded to his brother Karl.⁵²

The public airing of the work was included in a doctoral thesis Astrologia Sacra whose title gave no hint of the content. Durrwachter's account suggests that the apology was disproportionately meagre as the summation of so many years' work.⁵³

Tanner stressed that he wished Trithemius' works had never been written in the secret form, which had been responsible for so much of the notoriety it attained. He had found no reason in the writings to refute the late Abbot's own declaration of innocence, and therefore it should be taken on trust. He made a plausible account of Trithemius' search into magical practices as being an investigation to identify natural causes; it had been a search for wisdom as the writer had claimed.

Tanner's own work had been to establish Trithemius as following the true path of natural philosophy. He stressed that the secret writing had been only the standard method of keeping the knowledge for those who could use it properly and understand its meaning.

This was the conclusion to the Trithemius episode and possibly the Society was relieved at such an innocuous outcome. But Tanner's closer involvement with the world of magic than historical accounts actually show, is further supported by what Tanner did not say. In spite of his assurances of Trithemius' good faith, there were portions of the secret writing which the Jesuit left unrevealed,⁵⁴ and one assumes that with their transliteration, Trithemius' reputation as magician and conjurer of spirits would have been fully

confirmed with Tanner's role, already suspect, in jeopardy.

During this period Tanner had written and debated other works, which were accepted and approved by his Order, but in respect of his Trithemius translation he had come very close to disgrace. There were colleagues who had accused him of magic practices, and this aura of condemnation and accusation continually clung to him in the following years. But by no means was this view of him shared by all his colleagues.

He emerged from his years of study on the Steganographie a determined advocate of the continual search for natural causes underlying all the events described as magic or miraculous or demonic.

This was evident in his teaching and later in his defence of those convicted in the infamous witchcraft trials.

I have outlined some details of Adam Tanner's academic interests and his intellectual career to the year 1615, to the point two or three months after his letter to Aquaviva concerning Father Scheiner's apparent reluctance to avoid some anti-Aristotelian discussion of Galilean observations. In this account it is clear that Tanner had worked for years in a manner contrary to the majority views of his Order, and yet he had turned away from further study and discussion on the Galilean work apparently in deference to standard Jesuit views.

There is an implausibility here which forces us to search for other reasons, and it is probable that these may be found by checking in what ways the work and discoveries of Galileo may have affected

or intruded upon Tanner's beliefs and his particular studies in the field of magic. To Father Tanner, the discoveries of his time,⁵⁵ such as the camera obscura, magnetism, even Galileo's telescope,⁵⁶ were an evidence that a search for natural causes brought true knowledge. Why then, after his initial euphoria, could Tanner, with so much of the free thinker in his character, turn his back on Galileo's work?

CHAPTER 2 - References

1. The Catholic Encyclopaedia, Vol. XIV, p. 88 ff, Caxton Publishing Co. Ltd., London 1912.
2. It was at la Flèche that Descartes studied.
3. By the year 1615 Galileo's findings were published in Chinese, (although his name was not given) in a book by Emmanuel Diaz. See N. Sivin, 'Copernicus in China', in Studia Copernicana VI, Colloquia Copernicana II, Études sur l'audience de la théorie héliocentrique. Conférences du Symposium de PUIHPS, Torun 1973, Published by L'Académie Polonaise des Sciences, Warsaw 1973, p. 76.
4. G. de Santillana, The Crime of Galileo, Heinemann: London 1958, p. 23.
5. It should be remembered that news of sunspots was claimed to have been conveyed to Ingoldstadt by Father Gulden. In 1634 Gulden said he had first heard of sunspots from Galileo at the Roman College in 1611, and had informed Scheiner of their existence shortly afterwards. Observations were then undertaken by Scheiner and Tanner. See: Emil Wohlwill, Galileo und sein Kampf für die Copernicanische Lehre, Sändig: Wiesbaden 1969, p. 473.
6. B. Duhr, Geschichte der Jesuiten in den Ländern deutscher Zunge. 3 volumes. Herdesche Verlagshandlung: Freiburg im Breisgau 1913, Vol. 11.2, p. 384.
7. The accounts by Favaro and Duhr both working from primary sources differ in certain essentials. Duhr has Tanner and Scheiner

working together, Favaro reports them as working separately with some evidence of a priority dispute between them. This seems to have been settled amicably with Tanner conceding half an hour priority to Scheiner; I considered the possibility that Tanner's subsequent attempt to restrain Scheiner from pronouncing acceptance of some anti-Aristotelian views might be retaliation for the half hour priority concession, however the evidence did not support this.

See: B. Duhr, Geschichte der Jesuiten, Vol. 11.2, p. 436 and Antonio Favaro, Oppositori di Galileo Galilei, Cristoph Scheiner 1916. Atti del Reale Istituto Veneto di Scienze, Lettere ed arti, 1915-16, Tomo LXXV - Parte Seconda, Premiate Officine Grafiche di Carlo Ferrari Venezia.

8. Thomas Campanella was to refer to this in The Defense of Galileo, written in 1616, published 1622, Chapter 2.
9. B. Duhr, Geschichte der Jesuiten, Vol. 11.2, pp. 436-7.
Duhr indicates that Tanner had written previously on this matter.
10. Ibid. p. 438.
11. Father Scheiner was to become an important figure in the struggle against the hold of the astrologers and as late as 1634 Vitelleschi was writing to Scheiner in encouragement of this facet of his work. See: B. Duhr Geschichte der Jesuiten, Vol. 11.2, p. 438.
12. H. Grauert, Durrwachter on Tanner, p. 355.
13. Joseph Brucker, S.J. La Compagnie de Jesus, Esquisse de son Institut et de son Historie (1521-1773), Gabriel Beauchesne, Paris 1919, pp. 286-273.

14. D.P. Walker, Spiritual and demonic magic from Ficino to Campanella, The Warburg Institute, University of London 1958, pp. 152-156.
15. Ibid. pp. 156-166.
16. Ibid. pp. 90-96.
17. Ibid. pp. 83-84 give some helpful explanatory details on this point.
18. Ibid. pp. 178-185.
19. There were sound philosophical reasons for tracing the descent of knowledge from Adam. See Chapter 4 of this thesis.
20. D.P. Walker, Spiritual and demonic magic; p. 178.
21. Dr. Weyer, Johann.
22. H.C. Lea, Materials Towards a History of Witchcraft, Ed. Arthur C. Howland. 3 volumes. Thomas Yoseloff: New York and London 1957, Vol. 2. p. 491.
23. Del Rio was notorious for his staunch advocacy and incitement of witchburning. See H.R. Trevor-Roper's essay 'The European Witch-Craze', in Religion, the Reformation and Social Change, Macmillan, London 1967.
24. Ibid.
25. L. Thorndike, History of Magic and Experimental Science, Columbia University Press, New York. Vol. VI. See Chapter XXXIV 'The Catholic Reaction' for full details.
26. Ibid. pp. 156-7.
27. H.C. Lea, Materials Towards a History of Witchcraft, Volume 2, p. 701.
28. L. Thorndike, History of Magic and Experimental Science, Vol. VI, p. 151.

29. Marjorie Reeves, Joachim of Fiore and the Prophetic Future, SPCK, London 1976, pp. 116-121.
30. Marjorie Reeves, 'The Abbot Joachim and the Society of Jesus', in Medieval and Renaissance Studies, Vol. V, 1961, The Warburg Institute, University of London, p. 166 ff.
31. Marjorie Reeves, Joachim of Fiore and the Prophetic Future.
32. R.J.W. Evans, Rudolf II and his world: a study in intellectual history 1576-1612. Clarendon Press, Oxford 1973, p. 253.
33. Ibid. p. 161.
34. L. Thorndike, History of Magic and Experimental Science, Vol. VI, pp. 414-418.
35. Ibid. p. 415. Note that this is Thorndike summarising Maierhofer, not a direct quotation from Maierhofer.
36. That this was the case can readily be established by reading Thorndike, Vol. VI.
37. Thorndike, Vol. VI, p. 414.
38. R. Bellarmine, Controversiae Christianae fidei adversus huius temporis haereticos, 1584-93, 4 volumes. Bernardi Gualtheri: Coloniae Agrippinae 1620.
39. H. Grauert, Durrwachter on Tanner, p. 359.
40. Spee is noted in history as the great reformer on this issue. See H.C. Lea, Materials Towards a History of Witchcraft, Volume 2.
41. Jacob Gretser, b.1562, d. Ingoldstadt 1625, was a celebrated Jesuit writer who taught philosophy and theology at Ingoldstadt for twenty four years. He was a close friend of Bellarmine and of Mark Welser. Sommervogel lists 229 titles of printed works by Gretser.

42. Joannes Trithemius, Steganographia, hoc est, ars per occultam scripturam animi sui voluntatem absentibus aperiendi certa, 1606, Darmstadt.
43. H. Grauert, Durrwachter on Tanner, p. 363.
44. Ibid.
45. Ibid. p. 356.
46. L. Thorndike, History of Magic and Experimental Science, Vol. VI, pp. 96-7.
47. H. Grauert, Durrwachter on Tanner, p. 370.
48. Frances Yates, The Art of Memory, Routledge and Kegan Paul, London, 1966, p. 211.
49. L. Thorndike, History of Magic and Experimental Science, Vol. VI, p. 424.
50. Adam Tanner, S.J., Astrologia Sacra hoc est orationes et questiones quinque, quibus explicatur, an et qua ratione fas sit homini christiano de rebus occultis, praesertim futuris, ex astris iudicium ferre ... Ingoldstadt, 1615.
51. Tanner did not supply the key, this being one of the sections which he did not reveal in his translation.
52. H. Grauert, Durrwachter on Tanner, p. 368.
53. Ibid. p. 371 ff.
54. Ibid. p. 373.
55. B. Duhr, Geschichte der Jesuiten, Vol. 11.2, p. 384.
56. Ibid. pp. 473-4. Tanner in fact taught and discussed Galileo's work with his graduands.

CHAPTER 3

Reasons for suspicion of Galileo:
personal links with the realms of magic,
astrology and anti-Papal thought.

If we look at Galileo's work, as it circulated in his lifetime, we find nothing that he writes which will connect him with the world of magic and witchcraft, and only a minimal link with astrology. If, however, we look at possible interpretations of his discoveries in the light of Jesuit problems; if we look at some of his many correspondents; if we trace the links of his friendships and acquaintances; the picture changes.

There will still be no tangible evidence that he indulged in or was interested in magical or astrological practice. Indeed, the man stands out from his milieu with an apparent total disinterest in the occult in any shape or form.¹ At an earlier stage of his life, we know that he charted a horoscope; more than this his writings and correspondence show nothing, hint at nothing.

Nevertheless, among the network of scholars and colleagues which he maintained throughout his intellectual career, there were many contacts, many interpretations which could be made to look suspicious. For Jesuits from, or in close contact with, the areas where the Counter-Reformation priests waged battle not only against Protestantism but also against occultism, astrological beliefs and witchcraft, there were clearly ways in which Galileo and his work would be unwelcome. Adam Tanner and like minded colleagues, whilst not necessarily suspecting Galileo the man of connections with magic

and witchcraft, could yet view his activities with extreme distaste. This antipathy was aroused on three generalised themes.

1. The multiplication of new stars which Galileo had discovered and which had been verified by leading Jesuit astronomers, added directly to the fears of the populace.
2. The work which for Galileo himself was manifestly observational astronomy and philosophy and mathematical explication, could be classified as forbidden astrology.
3. Galileo did have close connections with doubtful individuals. His brilliance and fame could lend credence to scores of scholars and dilettanti who were vitally involved with the spiritual and demonic aspects of magic. To these men the "novelties" ² he had discovered were an inspiration, an impetus for further work. His past too was littered with strange alliances.

For Jesuits in Prague, in Ingoldstadt, and neighbouring areas, the possible escalation of the community's fears, was of prime consideration.

Long before the advent of the telescope celestial events, real or imagined, were a source of morbid interest to people in the German lands. Comets and new stars, of which there were several correctly recorded in the last quarter of the 16th Century, were regarded by the populace at large as portents of dreadful events.

Astrologers and soothsayers used these celestial visitations to predict dire consequence for people of note, even for entire

districts. Predictions of war, plague, famine and death, caused great alarm and despondence, necessitating further astrological readings in search of newer, more favourable auspices. It was a period of wealth and power for astrologers and for the magicians whose aid was sought for invocation of magical protective spells. Large areas, whole generations, were held in fear, and firmly locked into the self-perpetuating process.

R.J.W. Evans discusses the pessimism or state of melancholy in and around the Rudolfine territory at the beginning of the 17th Century, a pessimism and inertia which the Jesuits strove to alleviate, and he sees the "roots of this malaise" in the astrological debate.³

Miss Yates discusses the same period when "every kind of magic and occultism was rampant" and sees "the demon ridden atmosphere" as "the final outcome of the revaluation of magic ..."⁴

It is a fascinating era for study and inevitably historians differ in attribution of causes; what is not in doubt is that the effects reached all levels of society, and some measure of this pervasiveness can be gained from surveys of contemporary sources.

The turn of the 16th Century into the seventeenth was a hey-day in pamphlet production, a time when almost every town had at least one printing-house; Ingoldstadt had three, Augsburg as many as 45, and from the printing houses flowed the ubiquitous broadsheets. These were the major disseminating influence for the rumours and predictions of bad tidings, emanating from astrologers and magic mongers.

Then, as now, bad news was of prime interest. Strauss quotes from Gustav Hellman's Die Meteorologie im den Deutschen Flugschriften und Flugblättern des 16 Jahrhunderts of 1921 in which he made a special study of the principal category of broadsheets which was that dealing with celestial events, and he noted a significant rise in issues towards the end of the 16th Century.⁵ The output of broadsheets predicting or connecting the battles, the epidemics and the plagues and famines with the astronomical signs, was significantly higher at the turn of the 16th Century and the first decade of the 17th Century in the Protestant German towns, the same areas where the Jesuits were heavily committed to their Counter-Reformation efforts.

In the existing copies of such broadsheets, it can be seen that comets, new stars and shooting stars were firmly established in the public mind as sufficient causal factors for the ever-present miseries, and as such they were greatly feared. This view was not confined to non-literate strata, being also prevalent within the educated groups and the literati.

As one example of this Alexander and Strauss⁶ quote Ambroise, a surgeon, who wrote of the 1577 comet thus: "This comet was so horrible and so terrifying, and it aroused such fear among the populace that some died of fright while others fell ill". His ensuing description of the comet is by no means sober reportage and indicates his own level of fright and superstition. Ambroise and his intellectual counterparts could read Starry Messenger and disseminate details of the newly discovered stars and of the closely scrutinised moon through all sections of society, offering more fuel for more fear.

In Rome in 1610 and 1611, Galileo's Medicean stars, his precisely estimated mountains on the moon, his suggestion of a likeness to Bohemia,⁷ could be a source of intellectual delight and stimulus to Jesuits of the Roman College.

A very different response might be expected from Jesuits to the North, where reports of the proliferation of stars and Saturnian rings in the Heavens would serve to multiply and aggravate all terrors and superstitions.

There was widespread acceptance that new stars and comets were malevolent initiators of doom and terror, and at the same time these areas were continually ravaged by battles and schisms, plagues and famines. The effective view of the world for people afflicted by such onslaughts was essentially a pagan one: for them, none of the spiritual consolations or material protections proffered by any of the Christian churches were sufficient to destroy their beliefs in prodigies.

We can imagine that the Jesuits saw the rampant superstition as the main obstacle to the reconversion of the populace to the true faith. Before the renowned skill of the Jesuits, in persuasion and parable, could be utilised successfully in propaganda of Catholic faith, the pagan beliefs of the populace had to be eroded. Hence their many attacks on astrology, magic and kindred arts. However, the boundary lines between the licit and the illicit were never clear. Formal demarcations and prohibitions could be evaded and abused, consequently there were those who found themselves, like Adam Tanner, on the wrong side of the line on one issue or another.

This feature of the "German" culture-area was peculiar to it, and it is important to keep this in mind. It contrasts sharply with other areas where, in spite of turbulence and intellectual and spiritual problems, there was not the gross weight of false belief as in Germany and related regions, where it flourished as nowhere else in Europe. Whenever we discuss the problems of witchcraft and astrology, this background must be borne in mind. Nothing could be more widely different than the intellectual bases of the imperial lands and Rome.

And it is essential to see the difference between the German Jesuits fighting astrology and all forms of magic, and Galileo and kindred philosophers who dismissed them as simply false. In 1611, many of the Roman College Jesuits in their euphoric welcome to Galileo, were not aware themselves of this crucial difference. As we have seen it was Tanner and his colleagues who apparently saw dangers in Galileo's writings and discoveries that were hidden from the enthusiastic scholars of the Roman College.

Given a united Jesuit onslaught, the task of subduing fears stemming from the astronomical novelties would be daunting; with 'one of our own', namely Scheiner, applauding their advent and publicising the reports, such attempt would be severely hindered.

Here we may have the reasoning behind Tanner's apparent volte-face on the Galileo work, and his subsequent request to Aquaviva that Scheiner be restrained from airing his views publicly. Reducing the effects of magic and astrology was an important project for very many Jesuits, including some in the Roman College. For example

in 1615 Alexander de Angelis⁸ published a series of books denouncing astrologers, arguing from the premiss that the mind and will are free; and I shall indicate later that at least part of the confrontation between Father Grassi and Galileo, in the years from 1619 to 1623, was based on Grassi's attempt to alleviate fears wrought by astrologers.

In the period beginning in 1610, Ingoldstadt Jesuits, proud of their designation "bulwark of Catholicism" were anxious to expand their Counter-Reformation activities ever further and were continually being delayed by the widespread occupation with magic and astrology among those whom the Jesuits hoped to draw back into the Church. It was a situation in which the problems inherent in the work of Galileo were an unwelcome intrusion.

Whether or not Galileo could have been unfairly suspected of indulging in forbidden aspects of astrology was not a question of ascertaining how many horoscopes he might secretly be charting. It was a great deal more subtle than that and concerned the implications of the 1586 Bull, which were still being explored and expanded by scholars.

Pope Sixtus V had taken a very firm stand against many forms of divination including astrology and against its practitioners. Using the Index of 1559 issued by an earlier Pope as a foundation, he issued a Bull in 1586⁹ which was intended to establish guidelines between the licit and illicit forms of such practices. At the basis of the ban was the Pope's wish to reinforce the doctrine of free will, which was being put at some hazard by the countless predictions of how individuals would act or be acted upon at future times.

But precisely as with the debate concerning magic, outlined in the previous chapter, so with the Bull against astrology and the ensuing studies. That which was totally prohibited was known; it was also clear that some aspects of prediction were part of the natural world and could be continued without disobedience to the Bull. However there were many areas between these extremes which gave rise to great doubts and in the following decades they were the subject of long and protracted scholarly discussion.

Thorndike carefully details ¹⁰ much of the continued attempt to separate a natural astrology from the forbidden astrology. Prediction of necessary or frequent events as utilised in navigation, farming and astronomy were acceptable. It is interesting to note that at this time the use of astrology in medicine was regarded as a necessary diagnostic measure and as such was firmly lodged in the category of Papal approval. The forbidden astrology was that which predicted fortuitous events.

Although astrologers in the 20th Century are usually regarded as beyond-the-fringe soothsayers, in the 17th Century astrology was an important study for many scholars. Three of the many names cited by Thorndike as being important writers in the astrological debate initiated by the Bull of Sixtus V, were as widely separated in style as della Porta, ¹¹ del Rio, ¹² and Magini; ¹³ which gives some indication of the range of interests and professional standing of those seriously interested in this field of knowledge.

Thus the Bull of 1586 started a renewed attack against astrological practices which were unacceptable to the Catholic Church and, although we know that it was disregarded by Urban VIII ¹⁴ in

the years following 1628 during his relationship with Campanella, the war against astrology did not abate. The Jesuits particularly saw its abolition as an important part of their duties. In 1633, for example, Vitelleschi the Jesuit General wrote to Scheiner congratulating him for his efforts in this direction.¹⁵

And in the middle of this debate, chronologically at least, came Galileo and his astronomical discoveries. Against this particular background, how would he be viewed? Was he an astronomer or an astrologer? Would his carefully chosen title of chief mathematician and philosopher protect him from suspicion? It was true that he did not cast horoscopes, but when he spoke of the return of spots as they traversed the surface of the sun, or the revolutions of the moons of Jupiter, or the phases of Venus as it moved round the sun, was he speaking of necessary or frequent events? Who would be sure in the first few years of discovery quite what he was doing. Might it not equally well be the forbidden prediction of contingent or fortuitous events?

In recording the paths of certain stars, planets and satellites with the greater precision afforded by his newly ground lenses, we know that Galileo regarded their movements as certain and predictable varying only within set mathematically deducible limits. And all of his discoveries were, to him, further material towards establishing the truth of the Copernican system. This was not the case with most of his contemporaries. Even of those who applauded his work, who feted him in Rome, very few understood the implications. When he started to work on establishing tables for the movements

of the moons of Jupiter, plotting and "predicting" the movements and appearances of these Medicean stars, there would be those in the anti-astrology camp who would be doubtful of Galileo's purpose.

It was widely known, even before his pro-Copernican statement¹⁶ of the sunspot letters, that he believed the hypothesis of Copernicus to be a true account of the heavens, and the problems which this caused him with the religious groups and with the Aristotelians have been well documented. But there were other considerations.

As Thorndike informs us, the Copernican system was first released in astrological vein,¹⁷ so that for many decades Copernicanism was seen as being linked with 'signifying the future'. In a period when della Porta who had written so much on divination felt it prudent to declare that since astrology had been forbidden to Catholics he had now relinquished his interest of a lifetime;¹⁸ when Magini writing on a licit area of astrology,¹⁹ namely its use in medicine, felt it necessary to protect himself before publication by checking his work with the Inquisitor and the University of Padua, and after publication by affirming his intention of not exceeding the limits set by the Roman Catholic Church; we can see that on many fronts Galileo was treading on dangerous ground. In this restrictive climate which informed della Porta and Magini, and many others, to be prudent concerning connection with astrology, it must be obvious that Galileo would be viewed with suspicion.

Even the telescope had suspicious connotations, and it is recorded how on his visit to Rome in 1611 there were those who would not look through the new instrument. In the Index of 1559 on which

Sixtus based his Bull of 1586, along with many books on magic and divination which were listed specifically, there were included works on rings, magic mirrors and images.²⁰ Without any difficulty the telescope could be seen as a compilation of these objects. With its initial use so closely aligned to what might be defined as astrological purposes, the fervent adherents to the anti-astrology edict of Sixtus would be worried indeed.

Santillana comments, "Let us imagine the telescope in the hands of a Giambattista della Porta or some such contemporary ..."²¹ In 1610, indeed for many following years, a large proportion of ecclesiastical scholars and many Jesuits, would not have placed Galileo in a different category from della Porta.

This brings us to the third area where Tanner and like minded colleagues in the Jesuit fraternity might wish that Galileo had not risen to prominence: his collection of friends, acquaintances and other connections. We might regard these as the sign of a laudably wide range of interests, a large measure of liberal thinking. In 17th Century terms the same wide range of interests, the measure of liberal thought would have merited disapprobation.

If we make the attempt to view the situation through the spectacles of Tanner et al., it becomes plain that many of the connections which Galileo had formed in the years prior to his return to Florence were, in themselves, enough to render him candidate for Jesuit suspicion.²² Giordano Bruno, Paolo Sarpi, Tommaso Campanella, Cremonini and della Porta could all be linked to Galileo. So too could many of the ecclesiastics and scholarly participants

in the confrontation between the Papacy and the State of Venice. Some of these links were possibly more tenuous than was believed, but together they amounted to a positive amount of circumstantial evidence, and when he arrived in Florence many of these connections were maintained or strengthened.

In May of 1611 in the Agenda for the Congregation of the Holy Office, the imperative annotation

"let it be seen whether in the proceedings against Doctor Cesare Cremonini there is a mention of Galileo, professor of philosophy and mathematics".²³

appeared and Santillana described this as "spotting by objective characteristics", or more simply, guilt by association. There was much of this associated guilt for Jesuits to ponder over.

It is true that Cremonini, for example, could not be regarded as a close friend of Galileo. He was, however, a member of the University of Padua, moving there to teach Aristotelian philosophy in 1591, the year before Galileo arrived there as mathematics lecturer. In 1606 there arose a set of circumstances which would link together all Paduan academics who remained in the University's employ. This was the beginning of the notorious affair known as the Venetian Interdict, the confrontation of the Republic and Paul V. The University of Padua put the weight of its influence squarely behind the Signoria, against the Papacy. A group of lawyers, in September 1606,²⁴ published three reports defending the Republic's theological position in the name of the entire University. Cremonini vigorously upheld this view.

The philosophy taught at Padua found no favour with the Roman Church and when Cremonini's book, de Coelo, was published in Venice in 1613 the Roman Inquisition - who had already felt it necessary to check some of his earlier work - investigated further. The following year they started proceedings against him. The affair was smoothed over and Cremonini remained safely in Padua.²⁵ However, he continued to be held in great disfavour in Rome.

If such slight connection as there was between Galileo and Cremonini served to alert Cardinal Bellarmine to closer scrutiny, there were very many other associations to warrant his wariness. None of these will be new, but it may be interesting to see them laid out together.

To Robert Bellarmine, in 1599, had fallen the task of checking the works of Giordano Bruno,²⁶ in order that the heretical theses could be itemised and presented to Bruno for his recantations. Abjuration not being obtained, Bruno was burned in 1600.

Bruno left Padua for Venice and was arrested there in May 1592, Galileo arriving in Padua later the same year. Yet, in spite of their not having met, there was association of a kind; not physical association but certainly an intellectual one. Bruno had been in the habit of visiting Andrea Morosini in Venice, to attend and to speak at the informal gatherings held there. To this same Morosini household, shortly afterwards, Galileo was to become a regular visitor,²⁷ and there were further links of the "once-removed" kind.

When in Paris, Bruno had been a close associate of Jacopo Corbinelli a trusted employee of Henry III. Corbinelli, whilst

in Paris, corresponded with Gian Vicenzio Pinelli in Padua relating to him news from Paris and helping him in amassing Pinelli's library.

Miss Yates says of Corbinelli, that he was

"one of a group of Italians faithful to Henry III, interested in Henry of Navarre and his destiny, and in contact with Pinelli at Padua".²⁸

Galileo, in Padua, regularly used the library of Pinelli, with whom he was on intimate terms,²⁹ and indeed Pinelli was in close contact and amiability with scholars from many fields and persuasions. Although these included members of the Society of Jesus,³⁰ Bellarmine among them, some of the contents of Pinelli's library were such as to arouse possible questions concerning Galileo's particular interests there.

Paul Grendler has shown that among the books owned by Pinelli there were forty-four different banned authors and ninety prohibited titles.³¹

It was also in 1592 that Galileo met the Dominican Campanella, shortly before he was denounced for heresy and imprisoned. Three years before this Campanella had been an active member of the group centring on della Porta in Naples. These men were closely involved in magic, astrology and natural philosophy; Campanella's great interest in occult art originated in these Neapolitan days. Galileo and Campanella had little time for acquaintance, but the connection was made and certainly would rear its head again at inopportune moments. The appearance of Campanella's Apologia pro Galileo in 1622, written during imprisonment and published from Frankfurt, was most unwelcome to Galileo.³²

But the most damaging friendship from Paduan days must surely have been that with Paolo Sarpi, Servite friar. Indeed, Caccini was to refer scathingly to this connection when denouncing Galileo in 1615.³³

Sarpi, avowed enemy of the Society of Jesus, played a bitter and persistent role in the permanent banishment of the Society from Venetian territory in 1606. He had a specially influential part in the struggle between the Papacy and Venice guiding the Signoria with anti-Papal ferocity. Wotton, the English envoy in Venice, had described Sarpi as "a true Protestant in monk's habit".³⁴

Under the influence of Sarpi it seemed possible that the State of Venice might move from Catholicism to Protestantism. The Signoria and Pope Paul V had a moderate reconciliation in 1607, but Sarpi himself was excommunicated and together with his disciple Fulgenzio Micanzio continued to put forward an almost wholly Protestant teaching from Catholic pulpits. And indeed de Dominis, Archbishop of Spalatro, a colleague of Sarpi's, renounced Catholicism at a later stage and entered the English Church.³⁵

During this period Sarpi, a scholarly theologian,³⁶ issued many pamphlets and theses concerning the role and limits of the Papacy, material which was avidly circulated in Protestant quarters and used in furthering the Protestant cause. And against Sarpi's words, many Jesuits were called upon to retaliate. Bellarmine, Gretser and Tanner were among the notable scholars involved in this debate. When Galileo's Starry Messenger brought him into great prominence in 1610 and on his subsequent congratulatory visit

to the Roman College, the connection with Sarpi must have been well to the forefront of some Jesuit minds; the questions were surely asked of Galileo, "why had he come to Rome?" ³⁷

A common factor of those men who have been mentioned here as having tenuous link with Galileo, is to be found in their dissatisfaction with certain dogmas of the Catholic Church and with the Papacy's continued claim to temporal authority, in addition to spiritual authority, over the monarchies of Catholic countries. It was a widespread dissatisfaction but fortunately for the Papacy, it was for the most part too diffuse to initiate a second reformation.

This is not to suggest that Galileo was part of such movements, but that some suspicion of involvement must surely have clung to him. When he left Padua for Florence and returned to the influence of Rome and of the Jesuits, he did not move with clean feet. During the many dark political intrigues which had occurred in the previous years - Sarpi and the Interdict, Bruno's intellectual enclave - Galileo had always been near the activity; not of it, but near it. Perhaps too near, too often, for mere coincidence, his detractors might reasonably have thought, and no doubt this was in many minds subsequent to his move into the Medici household.

And once he had arrived, whilst courting the Jesuits and their validation of his work, he cultivated new acquaintances, new groups, with the same liberal, lively minds as those left behind in Venice.

One of the earliest signals that this would be so was his Lincean membership. The Academy of the Lincei had been founded

by Federico Cesi with the main objective of studying natural phenomena. During Galileo's visit to Rome in 1611 to discuss his discoveries with Jesuit scholars he was entertained by Cesi and the Linceans, and whilst in Rome Galileo became a member of the Academy. The Lincean Academy was certainly a base for high intellectual endeavour and yet there were aspects of the group which could give rise for concern among Galileo's detractors.³⁸

Prince Cesi, leading nobleman, of impeccable family, had been a student of Giambattista Porta mentioned earlier as a man keenly interested and involved with natural magic. Porta's Magiae Naturalis Libri iiii 1558 went through several editions, each one subject to changes by the author as he studied and experimented. Porta's enquiries never abated and as late as 1614, at the age of 79, he still claimed knowledge of successful transmutation from base metals to gold.³⁹

Porta was the fifth member of Cesi's Lincean Academy and possibly its most widely read member, so that when Galileo joined them in 1611 their links with the study of magic were well established. The aim of the Academy, which was to be a close study of natural philosophy, sounds innocuous - even laudable, but the methods aroused suspicion and mistrust from academic and theological circles. Cesi and his colleagues rejected the scholastic dependence on ancient authors, which played the major role in study by Churchmen and scholars. The Lincean approach to the natural world was largely through observation and experiment and the investigation of natural magic. As a consequence there was a growing antagonism, from the entrenched

scholarly group, towards science in general and to the Lincean Academy.

The move by Linceans from the traditional scholarship and particularly from Aristotelianism⁴⁰ was one cause of mistrust, another was the area of magic itself, which increasingly worried the Church hierarchy. The absence of carefully defined boundaries, concerning magic, created endless confusion. Demonic magic involving, as it did, conjuration and incantation was heretical; but so too was disbelief in its possibility. To deny existence of a diabolic realm was to throw doubt on any spiritual world. Therefore rules concerning this black magic were strict and understood; magic did exist, conjurations could occur, but Catholics were to take no part in it and punitive measures were stringent.⁴¹

Such direct regulation suggests a network of listed infringements and standard punishments but, like most judiciary systems, the areas covered by the general rule were subject to shifts of meaning and interpretation, and shades of misunderstanding both genuine and deliberate, so that the whole field of magic was rendered uncertain and frightening.

If demonic magic was seen to be dangerous, there were also threats to religion in non-demonic magic, so that those interested in the areas of natural magic (that we might call early steps in science) were not free of taint. D.P. Walker makes an important point in this connection:

"The production of effects by applied psychology or magic differs from many religious practices only in that no divine cause is assumed. Natural, non-demonic magic is therefore an obvious threat

to religion, since it claims to produce the same effects without any supernatural agent".⁴²

Against such a framework we can readily understand that Galileo, exactly as was the case with any relationship he might have had with astrology, could never be free of suspicion of some connection with magic. And again, the one instance of the telescope epitomises the reasonings: if he was exploring natural magic (that is producing effects by a little known but completely demonstrable cause) then there was threat to established Church in denying the necessity of a supernatural agent. If it was demonic magic (that is producing effects by soliciting help from diabolic source), he was trafficking with the wrong, the forbidden, section of the spiritual world.

The study of natural magic therefore, by the Linceans and others, was subject to suspicion and mistrust. The line between study of natural effects on the one hand and the attempted control of minds and events on the other, was in reality a huge surface of views and opinions, myths and scholarly treatises. It was a surface for which no taxonomy had yet been devised.⁴³ The history of 16th and 17th Century scholarship is riddled with these problems.

To prelates and academicians, what the Linceans were attempting to do was totally unknown, but probably threatening to undermine the basis of religion. Their Academy caused doubt before the advent of Galileo and we can imagine how this would be reflected on him with acceptance of membership. Already questions were being asked about him. We know that at this time Bellarmine was checking on him and specifically requested information in regard to Cremonini

and Galileo. We can imagine that from this point on Galileo was the subject of intense scrutiny from many quarters and against differing frames of reference.

CHAPTER 3 - References

1. This in itself is almost deviant, given the astrological ambience of his time.
2. In the correspondence of Galileo the word 'novelty' appears again and again. It was the discovery, rather than the implications, which excited so many. Sir Henry Wotton, English Ambassador to Venice, writing from Venice to the Earl of Salisbury in March 1610, also tells of these 'superior novelties' discovered by Galileo. He does however, encapsulate much of the problem which would surround Galileo for the rest of his life when he wrote "he hath first overthrown all former astronomy - for we must now have a new sphere to save the appearance - and next all astrology. ...and why may there not yet be more?" L. Pearsall Smith, The Life and Letters of Sir Henry Wotton, 2 volumes. Clarendon Press: Oxford, 1907, Vol. 1, pp. 486-7.
3. R.J.W. Evans, Rudolf II and His World: a study in intellectual history 1576-1612. Clarendon Press: Oxford, 1973. pp.278-9 where Evans discusses the widespread effects of the astrology cult. He notes the rise of the doom prophecies around 1600 and points out that the novae of 1572 and 1604 and the comet of 1577 were linked to prophecies by many eminent astronomers, Kepler and Tycho among them. One contributory factor in the astrological frenzy, which he cites and whose significance I had overlooked, was the confusion caused by the introduction of the Gregorian calendar in 1583.

4. F. Yates, Giordano Bruno and the Hermetic Tradition. Routledge and Kegan Paul: London, 1964, p. 433.
5. W.L. Strauss, The German Single Leaf Woodcut, 1550-1600, 2 volumes. Abaris Books Inc.: New York 1975, vol. 1, pp. 5-7.
6. D. Alexander and W.L. Strauss, The German Single Leaf Woodcut, 1600-1700, 2 volumes. Abaris Books Inc.: New York 1977, vol. 1, p. 21.
7. Consider how this suggestion might disturb the already superstitious inhabitants of the Bohemian regions.
8. L. Thorndike, History of Magic and Experimental Science, 8 volumes. Columbia University Press: New York, 1923-1958, vol. VI, p. 202.
9. Ibid, p. 145 ff.
10. Ibid. Chapter XXXIV.
11. Ibid. p. 162-3.
12. Ibid. p. 163.
13. Ibid. p. 164.
14. D.P. Walker, Spiritual & Demonic Magic from Ficino to Campanella. The Warburg Institute: London 1958, Chapter VII. Campanella. See particularly section (1) Campanella's Magic & Urban VIII, p. 205 ff.
15. B. Duhr, Geschichte der Jesuiten in den Ländern deutsche Zunge. Herdersche verlagshandlung: Freiburg im Breisgau 1913, Vol. 11.2, p. 438.
16. Stillman Drake, Discoveries and Opinions of Galileo. Doubleday & Co. Inc.: New York 1957, p. 144. Note here that at

this time we begin to see early Jesuit withdrawal.

17. L. Thorndike, History of Magic and Experimental Sciences, Vol. V, p. 414.
18. Ibid, Vol. VI, p. 162. Thorndike points out that although della Porta clearly stated he no longer accepted astrological belief, his refutation was in fact a handbook for astrology.
19. Ibid, Vol. VI, p. 164-5.
20. Ibid, p. 147.
21. G. de Santillana, The Crime of Galileo, Heinemann: London 1958, p. 38.
22. I am aware here that not only the Society of Jesus but also other orders, including the Dominicans and a generalised section of the Church shared in this suspicion. However I have not extended this discussion to include such factors, being particularly interested in Jesuit reaction.
23. This translation is on p.29 of de Santillana's Crime. Ed. Naz. Vol. 19, p. 27, shows that this annotation was recorded on page 202 of the "Arch. della Sacra Congregazione del S.Ufficio in Roma, Decreta 1611, P200, Feria 111, Die 17 Maii, 1611". Cardinal Bellarmine is listed amongst those present on that date.
24. L. Pastor, The History of the Popes from the close of the middle ages. Kegan Paul, Trench, Trubner and Co. Ltd.: London 1941, Vol. XXV, p. 145.
25. Ibid, Vol. XXV, p. 302.
26. F. Yates, Giordano Bruno and the Hermetic Tradition, p. 349.

27. W.J. Bouwsma, Venice and the Defense of Republican Liberty. University of California Press: Berkeley and Los Angeles 1968, p. 236. See also Gaetano Cozzi, Paolo Sarpi tra Venezia e l'Europa, Einaudi, Torino 1979, p. 137.
28. F.A. Yates, Giodano Bruno and the Hermetic Tradition, p.294.
29. Ibid, p. 358.
30. Gaetano Cozzi, Paolo Sarpi tra Venezia e l'Europa, p. 149.
31. Paul F. Grendler, The Roman Inquisition and the Venetian Press, 1540-1605, Princeton University Press: Princeton, New Jersey 1977, p. 289.
32. Ed. Naz. Vol. 13. Galileo to Cesi, 4th April 1624.
33. de Santillana, Crime, p. 48.
34. See Pastor, History of the Popes, Vol. XXV for some account of this period.
35. de Dominis, Archbishop of Spalatro, left Rome and joined the English Church in 1616. He recanted in 1621 and was pardoned by Pope Gregory XV. See L. Pastor, History of the Popes, Vol. XXV.
36. The term "theologian" is used here, of Sarpi, as this has been the category into which historiographers have placed him. However, the recent and very penetrating work by David Wootton, Paolo Sarpi between Renaissance and Enlightenment, Cambridge University Press, 1983, suggests that this may be a misnomer and that Sarpi's scholarship was not undertaken to elicit closer understanding or acceptance of the nature of God, nor of the tenets and doctrines of Christianity. Wootton's research indicates that Sarpi's writings were

a continuing attempt to limit and restructure religion in ways which might better serve a secular state. See pp. 24-35 " 'Pensieri sulla religione': defects of Christianity", and pp. 38-43 "Sarpi unmasked".

37. In connection with Galileo's reasons for returning to Florence, Gaetano Cozzi in his essay "Galileo Galilei, Paolo Sarpi e la società veneziana" in Paolo Sarpi tra Venezia e l'Europa, has made an interesting case for the suggestion that Galileo may have left Venice as a consequence of a disagreement and cooling of relations between Galileo and Sarpi, which certainly occurred at this time. However this does not satisfy me as Galileo's motive for moving back to Florence. As detailed by Cozzi, the diminishing of Jesuit influence in Venice and the Society's final banishment from the Republic coincides closely with Galileo offering his services to the Grand Duke in December 1605. His letters then and in succeeding years to members of the Tuscan court outlining the difficulties of working in an area of such tension as that of the Venetian Republic, give clear indications of his wish to return to Florence at a time predating the cooling of relations with Sarpi. It remains my view that Galileo wished to be firmly in an area of Jesuit intellectual power for the promulgation of his work on motion, and after 1610 of his new cosmology.
38. S. Drake, Galileo at Work, The University of Chicago Press: Chicago 1981, pp. 166-167. Stillman Drake makes the point that certain University professors, known and entertained

by Cesi and fellow Linceans, were not invited to join the Academy. He adds that Galileo's move to Florence had taken him from university circles and that the relationship with Lincean members at home and abroad successfully filled this gap.

39. Thorndike, History of Magic and Experimental Science, Vol. VI, p. 246.
40. de Santillana, Crime, p. 24.
41. Even in this area there was debate. Both conjuration and incantation depended on the form of the words and there was much discussion as to exactly where the power resided; in certain words or in their special assembly. Both L. Thorndike in his History of Magic and Experimental Science, Vols. V and VI, and D.P. Walker in Spiritual and Demonic Magic, have information on this subject.
42. D.P. Walker, Spiritual and Demonic Magic, p. 83.
43. Witchcraft, edited by Barbara Rosen. Edward Arnold Ltd.: London 1969. For some short account see pp. 3-19.

CHAPTER 4Cardinal Bellarmine

In the previous chapters it has been seen that Jesuits like Tanner and Scheiner reacted ambivalently to Galileo and when we review the events of 1616 or, more precisely, the role of Cardinal Bellarmine in those events, we see a similar, and very remarkable ambivalence in the Cardinal's behaviour. To outline this it is illuminating to examine the historical facts of their relationship briefly, and we know these to be far from straightforward.

It was the Cardinal who from 1611 had kept a watching brief on Galileo. As mentioned in the Prologue, Bellarmine had used the telescope, he had consulted Father Clavius on the authenticity of the observations and Father Clavius had affirmed their correctness. Galileo was then given audience by the Cardinal and shortly afterwards in May of 1611 Bellarmine discussed with his fellow Cardinals of the Congregation of the Holy Office the possible relationships, if any, between Cremonini and Galileo.

We can immediately infer what Bellarmine was looking for. In the previous chapter I discussed the Venetian situation of the years around 1606. Galileo was at the University of Padua at a time when all its members were declared to be in support of the Venetian State in its resistance to Papal temporal authority, and Galileo had had some connection, however tenuous, with the Bruno circle. Would we be assuming too much if we believe that in the writings or the intra-fraternal correspondence of Tanner, Gretser,

Bellarmino et al., Galileo's name and connections would have been noted. When Bellarmine raised the issue of Galileo's connection with Cremonini, in May of 1611, it seems that the Cardinal had categorised Galileo as a possible source of problems. Given the background information readily available to Cardinal Bellarmine this would be a sensible and natural precaution.

In April of 1615 however, when the Cardinal replied to the letter from Paolo Foscarini, a level of kindness towards Galileo seems to have emerged. It is true that he was known to be a kindly man, but his comments on this occasion were surely more than mere kindness, veering towards protective warning. He wrote,

"It seems to me that your Reverence and Signor Galileo act prudently when you content yourselves with speaking hypothetically and not absolutely,¹ as I have always understood Copernicus spoke".

This was at a time when Galileo had almost, if not quite, avowed the physical truth of the Copernican theory. In his Letters on Sunspots of December 1612 Galileo had predicted that after the winter solstice of 1614 Saturn, which currently appeared to be a solitary body, would be seen to be accompanied by two more stars, and added the following comment,

"And perhaps this planet also no less than horned Venus, harmonizes admirably with the great Copernican system, to the universal revelation of which doctrine propitious breezes are now seen to be directed toward us, leaving little fear of clouds or crosswinds."²

Given the growing anti-Copernican climate as then being promoted by Caccini and other Dominicans, as outlined in the Prologue, Cardinal Bellarmine could not have approved of Galileo's pro-Copernican view

so boldly stated. Nor could he have approved of the letter to Castelli of December 13th, 1613, in which Galileo had expounded his personal Biblical exegesis. How then can we interpret the letter in 1615 from Cardinal Bellarmine to Foscarini?

In the Foscarini letter Bellarmine emphasised that interpretation of Scripture was for theologians only; that even they remained constant to the writings of the Fathers; and that Copernicus had not intended his work on the movements of Earth and Sun to be understood as a model of the physical world.

And yet, in this same letter Bellarmine applauds Signor Galileo for acting prudently by speaking hypothetically of the Copernican system and spells out in detail the problems of secular attempts to reinterpret certain Bible passages. Galileo's name is not mentioned with regard to the Scriptural interpretation, but comparison of the Cardinal's letter ³ with that from Galileo to Castelli, ⁴ will show us who was in the Cardinal's mind.

There was protection and a hint of warning in Bellarmine's affirmation of Galileo's prudence: a prudence which could not stand scrutiny, as Bellarmine well knew. Nevertheless the Cardinal's published belief would be regarded as a safeguard by many. The carefully couched arguments in the Cardinal's letter showing the problems of piecemeal interpretation of Scriptures are both warning and help to Galileo: warning that he has been noted stepping on forbidden ground (a stage at which the Church could have formally reprimanded him); helping, by spelling out both the limits of secular philosophizing in such matters and the conditions under which the

Church itself might start the process of reinterpretation, namely a real proof.

It has been suggested that an allegiance by Cardinal Bellarmine to the Grand Duke, nostalgically retained as from a Tuscan to the head of Tuscany's ruling house, was largely responsible for the way the matter was being handled. It may be that what I see as especial kindness was no more than formal courtesy to the Grand-ducal house which employed Galileo, but the continuing encounters involving Galileo and Bellarmine suggest a warmth and a shielding beyond the call of courtly manners.

At this point it is worthy of note that eight years later, and after Cardinal Bellarmine had died, there were Jesuits who clearly believed that the Cardinal had meant that reinterpretation of at least some Scriptural passages was possible on production of proof of heliocentrism. I will show later that they thought Galileo might be able to produce such proof and that he was asked to do so.

As discussed in Section 2 of Chapter 1, in February 1616 Cardinal Bellarmine was directed by the Pope to call Galileo for interview and to pass on to him the decisions of the Congregation of the Holy Office, concerning two propositions on which judgment had been passed.⁵ These propositions were:

- (i) The Sun is the centre of the world and hence immovable of local motion.
- (ii) The Earth is not the centre of the world, nor immovable, but moves according to the whole of itself, also with a diurnal motion.

The duties of Cardinal Bellarmine in the matter of the Decree were clearly outlined and defined, and it was expected and required that he would carry them out to the letter. Giorgio de Santillana⁶ has compared the prescribed sequence of events in the Papal instruction of February 25th, with the account recorded in the same Inquisition file of the proceedings at the Cardinal's Palace on the following day, when Bellarmine informed Galileo of the Congregation's decision.

The Pope had directed that Cardinal Bellarmine should admonish Galileo to abandon adherence to the two Copernican propositions which had been subjected to scrutiny and subsequent censure. If Galileo should refuse he was to be commanded before a notary and witness to abstain "altogether from teaching or defending this opinion and doctrine and even from discussing it". Had he not acquiesced he was to have been imprisoned. The recorded account of what took place is the subject of doubt as detailed in Chapter 1, Cardinal Bellarmine certainly informed Galileo that the two relevant propositions were in error and had been censured. It seems equally certain that Galileo immediately concurred.⁷ In 1633 at the time of the trial the file on Galileo detailed a different state of affairs, by which time the Cardinal was not available for his recall of events.

Ten days after the audience with Cardinal Bellarmine and the day after publication of the official prohibition, Galileo wrote to Curzio Picchena, the First Secretary of State to the Grand Duke, in order to assure them that all had gone well. It has been suggested that in 1633 when Galileo affirmed that on February 26th, 1616,

he had not been instructed not to discuss, teach, hold or defend the Copernican hypothesis, the gloss of years had erased parts of the proceedings from his mind. The contemporary records (circa 1616) do not support this; Galileo during March, judging from his letters was happy that he had not been stigmatised.⁸ It is equally clear that others did not agree. Within weeks the rumours that Galileo had been dealt with ignominiously were being regarded as factual.⁹ If Bellarmine had dealt lightly and benignly with Galileo, Galileo's detractors were already seeking to redress the balance.

Galileo was angered by the letters reaching him. Giovanfrancesco Sagredo wrote from Venice in March and reported that there the story of Galileo's reprimand was circulating.¹⁰ We know that as a result of the gossip Galileo asked for, and received, a letter giving the true account from Cardinal Bellarmine.

In his reply of 26th May, 1616, the Cardinal was explicit.¹¹ The gossip being repeated was calumny: Galileo had not abjured to anyone; the proceedings had only been a conveyance to him of the "declaration made by the Holy Father" and published by the Congregation of the Index that the Copernican doctrine was contrary to scripture and could not be defended or held.

It is worth noting here the promptness with which Cardinal Bellarmine supplied the letter. Galileo felt it necessary to make his request towards the end of April. There are only ten weeks between Sagredo's letter from Venice and Bellarmine's letter. For Cardinal Bellarmine there was no compulsion to comply with Galileo's request and if, in the interests of courtesy to the Grand Duke,

he had felt obliged to offer some written explanation, Cardinal Bellarmine, without any contravention of protocol, could have been tardy in reply and far less generous in content.

The results of the Congregation's decision were, as de Santillana points out,¹² that the Copernican movement had been stopped dead in its track; but this in no way states an intention. On the face of it, in 1616 Galileo was the only major figure to espouse Copernicanism and to provide new and possibly supportive astronomical observation, and he also showed evidence that he could continue his work. Galileo also had committed no errors or transgressions as far as Church authorities were concerned. Galileo had acquiesced to the pronouncement concerning the two essential Copernican propositions and, following his excursion into Scriptural interpretation in the letter to Castelli, he had only received oblique warning via the medium of Bellarmine's letter to Foscarini. That was all. Rumour as to Galileo's possible disgrace was meant to be terminated by Bellarmine's prompt and precise letter.

It was as though in the condemnation of the Copernican theory, in which there was no mention of Galileo, it was intended to halt the wave of misinformed fears and abuses to which it pertained but tenuously. And that quietly Galileo might continue his search, under surveillance.

Is this a plausible interpretation of Bellarmine's influence and intentions? de Santillana gives a compelling account of Bellarmine's role and influential manipulation of the course of events preceding the Decree. The historic responsibility, he suggests,

falls on Bellarmine alone.¹³ I propose, however, that the intent was as outlined in the previous paragraph and that the result which, in the years following, came to be total suppression of new Copernican work, seems to have been as much the fault of Galileo's refusal to work through prescribed channels. This will be discussed in close detail in following chapters.

Meanwhile it is fruitful in a discussion of Cardinal Bellarmine's role in the Galileo affair, to understand his own intellectual career and to review the difficulties he had encountered himself, many years earlier, when attempting to establish new arguments in the political, moral, theological and particularly in the epistemological areas of thought. When Bellarmine came to view the problems of 1615 and 1616 he had a very personal understanding of Galileo's struggles and difficulties in combining concepts and politics.

Galileo, from the year 1610, was faced with two very divergent sets of ideas. There was the authority of Church and of tradition which welded Aristotelian views to Scriptural scholarship, to which as a good Catholic he was expected to conform. That he was a good Catholic at least in the sense that he wished to remain in the area of "Catholic culture",¹⁴ is shown by his chosen life-style. It is particularly striking that he chose to move back to Florence from Venice, in order to be nearer to Rome and the Jesuits. The Catholicism in Venice was of a "safer" nature: Venetian resistance to temporal claims of the Papacy meant that Church authorities there still maintained the division between purely religious matters and scholarship which encouraged so many men, like Sarpi, della

Porta and Bruno to pursue their own philosophy. And yet after the Decree of 1616 there seems to have been no suggestion of a move to a kinder intellectual climate. It was recognition in Rome and, above all, Jesuit recognition that he pursued.

When the Decree was read to Galileo, Cardinal Bellarmine understood the dilemma which faced the Florentine. Bellarmine too, had been in this situation; had been caught in the mental conflict between the Statements by Papal authority, which he was required to accept, and those he had deduced by the power of his reasoning.

From his own experience Bellarmine could conceivably have had a degree of empathy with Galileo; he might have seen that parts of Galileo's work and method encroached on his own analysis of knowledge. A brief survey of salient points in Bellarmine's own career will be no digression, but a means of highlighting areas of contact.

When Robert Bellarmine became a Jesuit in September 1560, Ignatius Loyola had been dead for only four years, and the Society some twenty years old, was a flexible, dynamic organisation. The days when it would become a bureaucratic organisation striving to impose a restrictive intellectual pattern on its members were yet decades away, and would have been thought impossible by the lively, innovating Jesuits of this early period.

During the years 1560-1569, Bellarmine studied, and later taught, philosophy and theology, first in Rome, then in Florence, in Piedmont and in Padua, moving to Louvain in 1569. Coming from an environment dominated by the Roman College, with its Spanish influence and scholastic methods, Bellarmine was to find in Louvain a very

different intellectual climate. E.A. Ryan has said that "no other Catholic school explored and opposed the Protestant doctrines so systematically",¹⁵ a point on which James Brodrick is in full agreement.¹⁶ It was here, working and teaching among many Jesuits with first hand experience of life in Protestant countries, that Bellarmine became sharply and personally aware of the painstaking scholarship on which much of the contemporary Protestant writing was based.

Present in Louvain when Bellarmine went there, was Dr Nicholas Sanders, member of a small group of English exiles. These men spent much of their time in correspondence with English-based colleagues, refuting and challenging the Protestant doctrine. James Brodrick sees this group as the catalyst for Robert Bellarmine,¹⁷ channelling his talents into a major effort for the re-establishment of Catholic theology.

Protestantism, from the time of its inception by Martin Luther, had been largely based on a rejection of the more gross abuses of the Catholic Church and the emotional appeal of Luther's 'justification by faith alone'. The doctrine of Protestantism came later and in piecemeal fashion, so that it was possible for Catholics to view it almost as a temporary, though extremely vigorous aberration. With the publication in 1559 of Flaccius Illyricus' The Centuries of Magdeburg,¹⁸ the Protestants declared a totally new and unprecedented challenge. Flaccius's series of volumes, the first issued in 1559 and the last in 1574, were the result of a great historical research project with the dual aims of showing that the

Catholic Church was not the true descendant of the Church formed by the Apostles, and that the Lutheran Church was the rightful claimant.

The Centuries was a major work in its own right, the historical scholarship being beyond question; but the impact was the greater because of the new method and the thoroughness with which it had been applied. This was no step-by-step rejection of accepted Catholic authorities, but a masterly synthesis of documents and historical sources from the time of St Peter to the 16th Century. The Catholic Church had nothing with which to reply, and the persuasive power of Flaccius' The Centuries spread through Europe with nothing to combat it.

In 1576 Robert Bellarmine was recalled to the Roman College to take the chair in controversial theology, a post which had not been filled for some time, and it was in this period that he was able to begin the series of lectures that he was to expand and publish in the four volume de Controversiis,¹⁹ the first being issued in 1584 and the last in 1593. These lectures were of great importance to the Catholic world. That there was a very large number of pamphlets and disputations printed in response to Bellarmine's first volume, in tribute or derision, is testimony of the importance of de Controversiis to both Catholic and Protestant scholars and theologians.

Many of these pamphlets show a largely scurrilous and non-informative content. But Brodrick, who has analysed much of the Bellarmine literature, gives an interesting account of the Oxford

and Cambridge reactions to Bellarmine's lectures and the de Controversiis. One example of the high regard for Bellarmine's scholarship, and its importance to the maintenance of Catholic doctrine and theology, was made clear in a paper written by Wm. Whitaker, Master of St John's College and Regius Professor of Divinity at Cambridge, in 1588,²⁰ and by the fact that his course for undergraduates was centred exclusively on Bellarmine's lectures.

There was also a response to Bellarmine's work at Oxford, a temporary lectureship being given in 1586 to Dr John Reynolds "for the confutation of Roman tenets". The weight of Dr Reynolds' work was directed towards Bellarmine, completing two hundred and fifty lectures in all. These began to appear in print in 1596.²¹

'Justification by faith alone' in place of the standard and much abused 'salvation by good works' was the central thesis by which Luther had been able to initiate the Protestant movement. This was no spurious catch-phrase. It was a conclusion which Luther, as a Catholic priest faced with absentee bishops and the corruption of indulgences and other abuses, had deduced slowly and painfully by a re-assessment of accepted theological principles. Other reformers, such as Melanchthon, Zwingli and Calvin, had wrestled with the same problem: how could man achieve salvation?

The Catholic way, by which man strove to perfect himself through life as a preparation for Heavenly judgment on death, lacked credibility when with the new wave of indulgences forgiveness in the next world could be promised on payment of money in this. Even the effort of spiritual improvement was reduced to a financial

criterion - sheer ability to pay. And in the absence of informed spiritual guidance which was the acknowledged lot of the majority of the ordinary people how could each individual measure his own progress? Could each sinner measure his own sin? Could he have knowledge of moral truths? The Catholic way required that he could.

The Reforming scholars each emphasized different theological propositions and as a consequence the differing doctrines of the Protestant groups were formed. But for each of these men and for all who chose to follow their argument, the main premise concerned the nature of man: not only in body and soul but in his faculties of sensation and intellect and the operations which would be performed by these faculties. How had these faculties been impaired by the fall of Adam? If man's nature was such that he could not attain knowledge for himself, particularly of moral and spiritual truths, then the Catholic road to salvation on which man strove towards perfection was unacceptable. And the Protestant view was that such a programme of spiritual improvement was not possible.

This was a debate which had interested many before the time of Bellarmine and indeed before Luther. St Augustine and St Thomas, in particular, had dealt with this question fully,²² but in view of its central place in all Lutheran arguments and in Flaccius' Centuries, Bellarmine reviewed it at length in the fourth book of de Controversiis.

Flaccius Illyricus held, as did many of the Reformers, that due to original sin man's rational soul is completely corrupted from being in the image of God, to being in the image of the devil.

It would not be true to say that all the Protestant theologians accepted this degree of degradation in man, nevertheless for all of them there was the belief that man's rational faculty was impaired. Given this state of intellectual and spiritual injury, any redeeming process between God and man was initiated by God and owed nothing to man's reasoned choice, or any of his good works. Salvation was offered for faith in Christ, and for nothing more, because nothing more was possible.

"For the first time, with the Reformation, there appeared this conception of a grace that saves a man without changing him, of a justice that redeems corrupted nature without restoring it, of a Christ who pardons the sinner for self-inflicted wounds but does not heal them".²³

This new conception by the reformers was an inspiration to many. Given the human condition of original sin, it seems impossible that in this fallen state man could so select his path from all choices offered and devise his programme of good acts which would lead towards salvation. The further implausibility of such human attainment, given the corrupt practices in some areas of the Catholic Church, added to the spiritual burden of many devout individuals. To these people 'justification by faith alone' was a lightening of the spirit.

On January 13th, 1547, in Session VI, The Council of Trent had reiterated the doctrine that man has a free choice in accepting redemption and that this necessitates preparation. Thus the very vulnerable traditional teaching was upheld.

In order to support this view, and also for the consistency of his own argument, it was important to Bellarmine to analyse the

power and scope of man's natural intellect. In doing so he framed new statements about the possible attainments of man's knowledge; these seem strikingly relevant when projected on to the Galileo problem. It must be understood that their immediate purpose was to assert in what manner man comes to know God: by revelation or by authority. It was in his full analysis that Bellarmine, almost incidentally, also outlined the range of man's possible knowledge.

The most important point Bellarmine makes in reply to Flaccius is to argue that, by the sin of Adam, man lost the supernatural gifts pertaining to "man made in the image of God". Before Adam's fall, man's nature was of the flesh and of the spirit, and Providence had given the spirit dominion over the flesh, so that the baser side of man's nature could not lead him away from God. After Adam, God's punishment had been to remove the superiority of the spirit in man,²⁴ and thereafter it became possible for the material part of man to rebel against his spiritual values.

This was a neat and precise distinction by Bellarmine, who (whilst acknowledging his debt to both St Augustine and St Thomas for his premisses) forged a satisfactory conclusion with which to confute Flaccius. For, reasoned Bellarmine, if that is the sum total of God's punishment then, for each of us, the evils of body and soul in our life times are the consequence of punishment, or²⁵ the consequence to each individual of the way he subordinates his baser nature to his spiritual nature. As such the evils do not fall on everyone equally.²⁶

Although the problem of the due degree of subordination of

flesh to spirit will be most acute in regard to appetite, the consequences of punishment for the original sin can be manifest in the intellect. And Bellarmine's next task was to assert the possibilities of man's natural powers of knowledge.

He divides human knowledge into three categories:
 natural knowledge - theoretical and mechanical,
 moral knowledge - what is in accordance with virtue,
 supernatural knowledge - what could not be known
 other than by divine revelation.²⁷

Since the third category is clearly outside the range of man's natural powers, it is with the first and the second categories that Bellarmine examines the range and limits of man's intellectual capacity.

In discussing natural knowledge, he accepted that by man's own nature he could know many theoretical and mechanical truths, which are contained in the arts and sciences and in natural things.²⁸ He argues that "what can be demonstrated by natural reason is certainly not supernatural nor above the power of natural intelligence".²⁹

It cannot be emphasized enough that Bellarmine was interested primarily, almost exclusively, in the possibility of man attaining moral and spiritual knowledge. Without this possibility there is no point in a programme of work towards spiritual improvement, as preparation for redemption. If one cannot know a moral truth through individual reasoning then the individual within the Church has to rely on the priesthood for instruction, and presumably the priests might claim their knowledge from revelation, either personally or

by tradition. But this leaves no pathway to redemption for those outside the Church, and such pathway has to be available if the God worshipped is the One and Universal God. This last point was increasingly relevant in Bellarmine's time, for the Jesuit missionaries at home and abroad.

So Cardinal Bellarmine had to show that man can attain individual knowledge of moral truths, and also how he attains it. In showing that indeed man could (and here he states categorically that the natural end of man is to live according to reason),³⁰ he indicated that we can deduce certain conclusions from first principles, and that the method is by reasoning. That we can reason and find truth is the basis of his arguments and "he defends the ability of the human intellect to know the truth naturally".³¹ His conclusion that the ills or wounds of the intellect do not fall on everyone equally, obviously limits the possibility of knowing truth for some individuals. This is a necessary restriction, for it is intuitively certain that the mental capabilities of many are small and diminished. For them the priesthood stands in loco parentis. Thus the Roman Catholic priesthood was defended against the Protestant view of "each man his own priest".

It is in relation to moral knowledge that Bellarmine so carefully shows that the human mind can achieve certainty,³² because it was at this point that the great cleavage from the Catholic Church had begun. It was not necessary to his purpose to go through the same process for the category of natural knowledge. At the time when he was writing, in the 1580s, the known propositions of

"theoretical and mechanical truths contained in the arts and sciences and in natural things" were demonstrable and certain. Nor did redemption have any relation to the knowledge one acquired of the natural world.

Certainty in physical matters was very straightforward to Cardinal Bellarmine, and to others of his time. A proof was that which could be shown repeatedly to be the case by re-assembling the required evidence and working through it again. Only in the realm of moral knowledge was there a lack of repeatable evidence and consequent proof, and therefore it was only in this area that Bellarmine found it necessary to show the possibility of a "proof-process" by reason.³³ In 1593 it was inconceivable that within seventeen years man's most important sense should be so extended as to give truths of the universe, not directly demonstrable.

However, in 1610, once the Galilean observations had been made and accepted by the Roman College, it is improbable that Cardinal Bellarmine would deny the possibility of at least one individual attaining an extended knowledge of natural things. A recapitulation of his account may be useful here:

- (a) He had shown, positively, that impairment of the intellect, which could be the consequence of God's withdrawal of the dominion of the spiritual element in man over his baser nature (following Adam's sin) was not equal in all men.
- (b) From this he argued that some individuals can know some moral truths.

(c) The process of attaining this knowledge was a reasoning process.

Cardinal Bellarmine, in the years 1611 to 1615, cannot have been unaware how closely his own analysis of the acquisition of some truths in the moral sphere, fitted Galileo's method in The Starry Messenger. The difference lay in categorisation - The Starry Messenger dealt with the natural order, not the moral one. The Cardinal's analysis of moral knowledge had been thorough, itemising examples, because this was his main purpose. He mentions natural knowledge only as a category and briefly, as outlined earlier.

But if he saw the analogy between his method and that of Galileo, he also saw that Galileo's observations were no proof of heliocentrism. Nevertheless, something had changed, irrevocably. The range of natural knowledge had altered. From his astronomical work beginning in 1610, Galileo had made new statements about the natural world, by reasoning from observations of physical phenomena. The method advocated by Bellarmine in de Controversiis for attainment of moral knowledge, and to which he had attached the possibility of certainty, was also a reasoning process.

With the new propositions put forward by Galileo, possible now because of the sense-extending telescope, Bellarmine was faced with an epistemological problem: what status had Galileo's propositions? When we move forward to Chapter 5 to discuss a paper by Father Grassi of the Roman College, in 1619, entitled An Astronomical Disputation on the three Comets of 1618, we shall see that this problem will still be only partially resolved.

In his paper Father Grassi accepts several of the Galilean observations, which are clearly non-Aristotelean, such as the circular motions of Venus and Mercury, sun spots, the Jovean satellites and the rings of Saturn.³⁴ He also accepts, although in poetic vein, that the moon is less beautiful than had been thought, but he does not mention "mountains on the moon" as suggested by Galileo, nor the analagous comment "that part of the moon's surface resembles Bohemia".

Here it is informative to recall Bellarmine's friendship with Gretser and less close relationship with Adam Tanner. From these men Father Grassi would no doubt be aware that to Ingoldstadt Jesuits, and to those in similar areas, some of Galileo's statements could lead to problems.

In the years from 1611 to 1615, as each new piece of work put forward by Galileo circulated amongst scholars, theologians and literati, there were those who believed that the case for heliocentrism was being established. There was the further possibility that having already enlarged the category of natural knowledge, Galileo might expand this area much more.

We can imagine that Cardinal Bellarmine, whilst clearly doubting the possibility of heliocentrism, certainly believed that if in fact it turned out to be the case a proof could never be demonstrated. Nevertheless he had allowed Galileo that small escape route: if further work brought further demonstrations, they might be looked at, it was even remotely possible that some Biblical reinterpretation could be undertaken, but all firmly under the aegis of the Church

or, as we shall come to see - under Jesuit scrutiny.

All this being so, we might ask why he gave the admonition at all? But this was the decision of the Congregation and was not one which Bellarmine, although part of that body, had the power to veto. It is true that at an earlier stage he could have stated his problem to the authorities, and informed them of the possibility that the new data being obtained by Galileo with the telescope, did not fit into any category of knowledge yet devised. It may be that he did precisely this; we simply do not know. But the problems which would have been created by such a step are fairly clear: had Bellarmine's worry been accepted in any public way, then some re-assessment of the work in the de Controversiis on the classes of knowledge would have been a necessary consequence.

The feeling of confidence in the Catholic world was quite high in 1616. The earlier, defensive period of Catholic apologetics was slowly closing, and for this Cardinal Bellarmine's de Controversiis had played an important part in establishing the historical validity of much Catholic doctrine. The initial pincer movements towards the Protestant states and principalities of the old Holy Roman Empire were already being made by the Jesuit advance guard of the Counter Reformation movement. That there would be the conflagration which we call the Thirty Years' War was not known, but that a struggle would take place ultimately could have been foreseen.

This was not a time when a cornerstone of Catholic apologetics could be moved for reshaping. A number of factors had made the Reformation possible, these included amongst others the abuses and

defections by many of the Clergy (at all levels), the total ignorance on doctrinal matters of most of the local priesthood, and the vast distance to Rome (the centre of the faith) which for the mass of people was a remote and inaccessible place. Some regions had been non-Catholic for a century, other regions had gone through a succession of differing Protestant doctrines; others yet had moved from Catholicism to Protestantism and back to Catholicism, as the heads of local princedoms had converted, married into a different faith, or been defeated in battle. And, as shown in Chapters 2 and 3, in many large areas astrology, magic and witchcraft had become the dominant beliefs.

The Counter-Reformation Church, which sought to re-establish Catholicism throughout Europe, had slowly come to admit its own past administrative and doctrinal failings and had launched a major programme of rectification. In this the Society of Jesus had taken a leading role. Priests, superbly trained in the finer details of theology, philosophy, dogma and doctrine, above all in spiritual example, had been established overtly or otherwise in cities, towns and small villages across the continent, so that abuses and ignorance, were being overcome. Their educational establishments, schools and colleges, were returning young noblemen back to their homes. Those youths who were Catholic were now well trained in Catholic belief, those from Protestant families were well educated and had seen a good side of Catholicism. Even the remoteness of Rome was diminished in the minds of local inhabitants when the Jesuits in their midst corresponded with Roman colleagues and travelled to Italy with some regularity.

The encyclopaedic work of Bellarmine which based the Catholic faith on firm theological principles, had been a uniquely cohesive factor in Counter-Reformation tactics. The de Controversiis was the work of many years, and many more years had gone into its assimilation and assessment. Its scholarship and its value were now virtually unassailable: against de Controversiis all Catholic doctrinal problems were measured.

Exactly how Galileo's method of analysis and his propositions fitted in with his own analysis of knowledge was likely to be an unwelcome question for Bellarmine at this point and was well outside the range of his personal work programme.

Galileo's knowledge did not fit neatly into any of the accepted categories and the history of his political problems is to a very large extent the history of the determined efforts of different groups to categorise his work, often unfavourably. In 1616, the Society of Jesus was not anxious to attempt a major philosophical assessment, unity and certainty was the corporate image for which they strove.

There are other aspects of Cardinal Bellarmine's experiences in writing and publishing de Controversiis which play a useful part in any attempt to understand his handling of the 1616 Decree.

During the process of writing and publishing his major work, he too had had problems with the Congregation, and in his case his volumes had been placed on the Index "until they shall have been corrected in accordance with the foregoing rules".³⁵ This was on the new Index, the Introductory Bull for which was dated 8th

March 1590, and which had been prepared following the request in 1587 from Pope Sixtus V to the Congregation of the Index. When the Bull was issued the Index, although printed, was not fully completed and was awaiting minor additions.

At this particular time relations between Pope Sixtus and the Society of Jesus were considerably strained. Previous Popes had differed greatly in their views concerning the Society and its constitutions as initiated by Loyola, and in 1587, two years after his elevation and following requests from some Jesuits for reforms within the Society, Sixtus undertook the study of Loyola's constitutions. In November of 1588, as a consequence of certain doubts arising from his study, he asked that two theologians should be appointed by the Roman Inquisition to study the constitutions, accompanied by a learned Jesuit and that the defects should be corrected. This was to be done under oath of silence, but it became known and letters were sent to Sixtus (following a request from Aquaviva, General of the Society) from Royal and Ducal houses in several countries lauding the work of the Jesuits.

The Inquisition's view was favourable in spite of Sixtus' wish to make changes, but they delayed informing him anxious not to clash with him. He was annoyed that they should be withholding their final report to him and declared that he would complete it himself.³⁶

Already exasperated with the Society, he was further annoyed by the recommendation of the Jesuit Bartolomeo Blondo that the people should pray for the safety of the Papal Nuncio, Cardinal Cajetan, currently in danger in the Siege of Paris.³⁷ Acting as adviser-

in-chief to Cajetan in the besieged French capital, surrounded by Henry of Navarre and his troops, was Father Bellarmine. The Nuncio was extremely unpopular with Sixtus and the Pope had Blondo imprisoned for his call for prayers.

There was even more cause for annoyance for Sixtus, when in Madrid, on Ascension Day 1590, a Jesuit announced from the pulpit that the Pope's attitude towards Henry IV was "encouragement to a heretic".³⁸ Henry IV was the former Prince Henry of Navarre, the Protestant prince who had been forced to become Catholic after the St Bartholomew's Day Massacre of 1572, and had then renounced his forced conversion.

In the backlash of his anger at the Jesuits, who seemed to be attempting to direct his policy in the French situation, Sixtus made a series of moves against the Society, one being that he had de Controversiis placed on the next Index. Volume I contained the offensive passage, the implications of which seemed to be that a Papal claim to temporal authority, supposedly derived from Christ's temporal jurisdiction, was unsound and showed a misunderstanding of Christ's role. For Sixtus, who was attempting to re-assert his temporal authority, particularly in the case of Henry IV, Father Bellarmine's analysis was a denial of the Papacy's divine right to total authority.

Although great efforts were made, notably by Aquaviva, the General of the Society of Jesus, to make Sixtus V reverse his decision on de Controversiis, he would not do so. An advance printing of the Index appeared and Robert Bellarmine's name and the title of

his work were included. Within eight days Pope Sixtus had died. The new Pope was Urban VII who, as one of his first acts, rescinded the ban on de Controversiis. Urban himself was only in Papal office for twelve days, but long enough to reinstate Bellarmine's work.

This chaotic situation, where his major work was rejected by one Pope because of his displeasure at the logical consequence of a philosophical argument, has a parallel in the Galileo case. In 1610 the Jesuits were applauding the work of Galileo, as outlined in Starry Messenger. By 1615, as we have noted, there was an almost total withdrawal of favour. For both Bellarmine and Galileo, their separate rejections, one in 1590 one in 1616, were rooted in emotive response to unacceptable conclusions. In both cases each felt his premises to be acceptable, and in Galileo's case they were in fact countersigned by the Jesuits of the Roman College. In 1616, any tendency Cardinal Bellarmine may have had to "wait and see", with regard to Galileo's new knowledge, would have been heavily reinforced by reference to his own problem in 1590. It is also significant that, once having arrived at his conclusion about the implausibility of a Papal claim to temporal jurisdiction, Robert Bellarmine never doubted the soundness of his argument. J. Brodrick, writing of Bellarmine's de Controversiis, tells us that in the revision of his works ³⁹ which was published in 1607 he brought forward new arguments. When, at the formal audience of February 26th 1616, Bellarmine admonished Galileo to:

"relinquish altogether the said opinion that the Sun is the center of the world and immovable and that the Earth moves; nor further to hold, teach, or defend it in any way whatsoever", ⁴⁰

Bellarmino would have known precisely the futility of such admonition and the inability of Galileo (and those who accepted his conclusions) to comply. It had not been possible for Bellarmine to reject his own conclusions when authority had found them offensive (as also many of his own order had), nor would it be possible that Galileo should.

When in his early career Cardinal Bellarmine had chosen to offer counter arguments to Flaccius Illyricus' The Centuries, it had been necessary to state that a reasoning faculty is present in man by which he may gain knowledge. Since this had to be a major premiss, it is important to discuss how sincere he was in his account. Then, as now, it was always possible to assume an argument, considered weak or false, in the absence of a better one. There are, however, a few pointers which give us an overall view of his integrity, so that we may accept that he was fully satisfied with his own account of the human capability in intellectual matters.

One indication of this integrity is in the limit he placed on the Papal jurisdiction. This was a source of acute difficulty for him during the reign of Sixtus V and, without doubt, he would not welcome the way his own reasoning was taking him on this subject. He was aware of the disfavour of many Catholic scholars towards his conclusions as, during his time in Paris in 1590 in the entourage of the Papal Nuncio, Aquaviva kept him fully informed of the Pope's annoyance and passed to him the message that "the Holy Father has now put the matter into the hands of the Cardinals connected with the Index".⁴¹ Nevertheless he did not withdraw his views and his

published work included his argument for the limitation of Papal claims to temporal authority over lands outside the Holy See.

Another factor we may take into account when judging his sincerity in stating the possibility of acquiring knowledge of moral truths, is the distribution he expected of his work. Although it was aimed at the wide class of European scholars, both Protestant and Catholic, he could not, prior to publication, foretell the full extent of his success. He would, however, be certain of wide readership in his own Order, and would be mindful that he was propagating his ideas among them, and the well being of his Order was ever present to Bellarmine. Ryan has said of him that "he was born into that movement", ⁴² and he would be unlikely to put forward suspect arguments to fellow Jesuits who would find his work certain.

de Controversiis was his major work and although he continued to add and amend to the end of his life, and kept up a copious correspondence in which he discussed and analysed its premisses and implications, he did not move from its original thesis.

There was a long standing propensity among members of his Order to make adjustments in theological matters, earning disapprobation from other Catholic Orders and scorn and disrepute from Protestant writers. In stating his account of the individual capacity to deduce moral knowledge Bellarmine's scholarship was meticulous. That there was no refutation or serious challenge to his work, indicates the power of his intellect and also of his integrity.

Another facet of the Galileo case which would have a decided effect on Bellarmine, was the role of some Dominicans in the repeated

efforts to bring Galileo's work into disfavour. It is true that part of the Dominican effort was due to the unacceptability of possible implications of a heliocentric theory, but part only. A major issue for them was the role in which the Jesuits of the Roman College had been cast as arbiters for Galileo's observations directly, and, as arbiters for the implications of those observations, indirectly. The Society itself finally balked at this indirect role, but not as quickly as the Dominicans might have wished. During the period when the Society seemed to be wholly supportive of Galileo, for the Dominicans it was a continuation of their tremendous quarrels with the Jesuits.

Following the publication of The Starry Messenger, the apparent approval of the Roman College for Galileo's new work may have suggested to some Dominicans a return, by the Society of Jesus, to the days when Jesuits had made decisions about heresy for themselves. If we look at the role played in the Galileo affair by Caccini, a Dominican, it could be construed as an attempt to bring into greater prominence an awareness of problems inherent in Galileo's work; problems which were partially obscured by apparent Jesuit approval in Rome.

Cardinal Bellarmine had been involved in an earlier confrontation between the Society of Jesus and the Dominicans concerning who decided what was heretical and for him too there may have been unwelcome similarities in the furore surrounding Galileo in the years between 1611 and 1616.

G. de Santillana has suggested of Cardinal Bellarmine that

he gained his opinions of Galileo's work from "Caccini's stuff".⁴³ This view fails to take into account the great scholarship of the Jesuits, and such charge seems the more improbable in the light of the long-standing tension between Dominicans and Jesuits. It is almost certain that Bellarmine would have felt obliged to give much more than cursory scrutiny to the Galileo case (or ask that it be done on his behalf) simply because Caccini who was instrumental in raising the scandal was a Dominican.

In collecting these separate strands from Bellarmine's career and linking them with his role in the events leading to the 1616 Decree, I have attempted to show some reasons both philosophical and psychological why the Cardinal might have sought to make a smoother path for Galileo. In his own lifetime, his one-time prohibited works, albeit a prohibition of only nine days, had come to be widely applauded; by his Order, by the Pope and his Church, and by a whole generation of scholars. Papal prohibitions could be overcome; if only by the inevitability of succession. Given a Papacy favourably inclined to Galileo's views, Galileo himself could have moved forward into discussion with no past dishonour dragging at his heels. Bellarmine's handling of the Decree and the subsequent letter which he wrote for Galileo were a good safeguard, and at Galileo's trial in 1633 this seems to have been the case. Although it is not the purpose of this paper to go beyond the year 1625 it might be interesting to see how this operated.

At the trial the Fiscal Procurator of the Holy Office, the Reverend Doctor Carlo Sinceri, asked questions which suggest that

the record dated Friday 26th February, 1616, (named Document 2 and given in full in Chapter 1 of this paper) was being accepted as an authentic account of the meeting to which Galileo had been summoned, in order to hear from Cardinal Bellarmine the decision of the Congregation of the Index concerning the Copernican propositions.

Galileo was asked what had Cardinal Bellarmine told him? Had anyone else spoken to him and what had they said? It is almost certain that the Procurator had in mind that section of Document 2 where it is stated that immediately after Cardinal Bellarmine had warned Galileo of the error of the Copernican view, Galileo was commanded and enjoined by Michelangelo Segizi to relinquish such opinion "nor further to hold, teach, or defend it in any way whatsoever, verbally or in writing". This, of course, is a much stronger prohibition than Document 1 in which it is not stated that he is to refrain from writing about the Copernican view.

Galileo's answer was to say that he had been told by Bellarmine that the opinion of Copernicus could be held hypothetically, as Copernicus himself had done, and in his reply to a further question asking what decision had been made and notified to him at that audience, Galileo produced a copy of the letter written to him on 26th March, 1616 (Document 4 in Chapter 1). In this letter Bellarmine writes that the Copernican doctrine cannot be defended or held.

This copy was taken into evidence as item B, Galileo stressing that he had the original letter which was in Bellarmine's own hand.

Sinceri continued to press for evidence that others had been present and had given precepts on the same point, clearly seeking to ascertain whether Galileo could recall the stronger prohibitions having been given to him, with no result. Stillman Drake⁴⁴ suggests that "the only real issue was whether or not he (Galileo) had received and disobeyed a specific personal order. On this matter, the paramount question was which of the two documents could be believed". The skilful protection established by Bellarmine in 1616 was a large contributory factor in the comparatively lenient outcome of the trial.⁴⁵

Judged from the probable viewpoint of Bellarmine in 1616, the whole affair had been neatly dealt with; the Copernican issue publicly shelved, scandal squashed, Galileo discreetly but honourably quietened until a more fortuitous time for re-emergence. The parallel with his own case was perfect. But in the end the essential difference was in the timing. Bellarmine's banishment was for nine days, in the event Galileo's opinions were to be submerged for many years.

In the ensuing chapters we shall see that other Jesuits would continue to be interested in Galileo's views. Their concern is less surprising when we recall that Bellarmine's apparent care in the Galileo issue was perhaps some continuation of the policy of dialogue and protection which Clavius had sought to establish in 1611 when he had known, and written, that something would have to be done about the new observations.⁴⁶ At the time of the Decree and after, there continued to be Jesuits who strove to follow Father Clavius' suggestion.

CHAPTER 4 - References

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4. Ed. Naz. Vol. 5. Galileo to Castelli, 21st December 1613.
This was the original letter and was later expanded into a
letter to 'Madama Christina di Lorena, Granduchessa di Toscana'
in 1615, see Ed. Naz. Vol. 5. pp. 309-349.
5. Ed. Naz. Vol. 19, p. 321.
6. de Santillana, Crime, p. 127 ff.
7. Two facts support this view. First, the letter written for
Galileo by the Cardinal, Ed. Naz. Vol. 19, p. 348. Second,
a report discovered by Gherardi in 1849 among Papal Decreta,
which states only Galileo's acquiescence and no further action,
see Ed. Naz. Vol. 19, p. 278, translation: de Santillana,
Crime, p. 133.
8. Ed. Naz. Vol. 12. Galileo to Curzio Picchena, 6th March 1616.
In writing to Picchena, Galileo lists the decisions on the
two Copernican propositions and names the works to be suspended,
those of Foscarini, Didaco a Stunica, and is able to say "Di
altri autori non si fa menzione", indicating that no comment
was made on his own writings.
Ed. Naz. Vol. 12. Galileo to Curzio Picchena, 12th March 1616.

In this letter Galileo tells of a favourable audience he has had with the Pope, lasting for three-quarters of an hour, and Galileo records that he told the Pope of the "false calumnies" issuing from his enemies and that the Pope assured him that he knew of Galileo's integrity and sincerity of mind.

9. Ed. Naz. Vol. 12. Sagredo to Galileo, 11th March 1616; Castelli to Galileo 20th April 1616; Sagredo to Galileo, 23rd April 1616.
10. Ed. Naz. Vol. 12. Sagredo to Galileo, 11th March 1616.
11. Ed. Naz. Vol. 19, p. 348, translation de Santillana, Crime, p. 132.
12. de Santillana, Crime, p. 141.
13. Ibid. p. 142.
14. This is an example of Ben Nelson's view "that the major advances in experimental design and mathematical achievement originated in Catholic 'culture areas', among Catholics who stood in various relations to their churches."
Nelson was wanting to show that the importance of the 'Protestant ethic', in the surge of scientific endeavour in Europe, is over emphasised. Benjamin Nelson "Comments by Benjamin Nelson, on Edward Grant's 'Hypotheses in Early Science' ", Daedalus, 1962, pp. 612-616.
15. E.A. Ryan, The Historical Scholarship of Saint Bellarmine, Universite de Louvain: Louvain 1936.
16. J. Brodrick, Robert Bellarmine, saint and scholar, Burns and Oates: London 1961.
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18. Flaccius Illyricus, "Ecclesiastica historia integram ecclesiae Christi ideam, quantum ad locum, propagationem, persecutionem, tranquillitatem, doctrinam, haereses, ceremonias, gubernationem, schismata, synodos, personas, miracula, martyria, religiones extra ecclesiam, et statum imperii politicum attinet, secundam singulas centurias perspicuo ordine complectens: singulari diligentia et fide ex vetustissimis et optimis historicis, patribus, et aliis scriptoribus congesta: per aliquot studiosos et pios viros in urbe Magdeburgica, Basel, generally known as "The Centuries of Magdeburg", or "The Centuries", 1564 to 1574.
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21. Ibid. Brodrick's interesting account of the reaction to Bellarmine's work concentrates on the English reaction. The response was equally great throughout Europe.
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25. Ibid. Column 222A.

26. Ibid. Columns 221D to 222A.
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28. Ibid. Column 624B.
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36. Pastor, The History of the Popes from the close of the Middle Ages, Kegan Paul, Trench, Trubner and Co. Ltd.: London 1941, Vol. XXI, p. 176.
37. Ibid. p. 177.
38. Ibid. p. 177.
39. Brodrick, Robert Bellarmine, p. 111.
40. Ed. Naz. Vol. 19, pp. 321/2. Translation: de Santillana, Crime, p. 126.
41. Brodrick, Robert Bellarmine, p. 107.
42. E.A. Ryan, The Historical Scholarship of Robert Bellarmine.
43. de Santillana, Crime, p. 144 and Prologue of this work for resumé of Santillana's view on Bellarmine and Caccini.
44. S. Drake, Galileo at Work, University of Chicago Press: Chicago 1981, p. 348.
45. The trial is documented in Ed. Naz. Vol. 19. A succinct and interesting account can also be found in Drake, Galileo at Work, pp. 337-352.
46. See Prologue and Prologue Reference No. 6.

CHAPTER 5Dialogue by Surveillance

Many of our twentieth century writers on Galileo have given a very brief and superficial account of Jesuit scholarship. In Chapters 2 and 3 I outlined areas of Jesuit influence in the 16th and 17th centuries, which suggest that the reputation they had at that time, as an Order with a highly intellectual membership, was well founded. To what extent then, did the Jesuit scholars understand and discuss Galileo's work?

We have seen that the Jesuit reception of Starry Messenger in 1610, was enthusiastic, though certainly not unanimously so, and that as a result of his paper, Galileo visited the Roman College, where he was well-received and applauded by many of the Jesuits. His work was discussed and his observations were verified.

Much of this enthusiasm, however, seems to have waned, and by 1616 when the Decree prohibiting discussion of heliocentrism was issued, open debate had already almost ceased. However carefully Cardinal Bellarmine sought to conduct his audience with Galileo, the import - if not the manner - was harsh and serious. Galileo's cosmological work had been halted.

The general account says little more of any discussion between Galileo and the Jesuits until the publication in 1633 of The Dialogue Concerning the Two Chief World Systems, with perhaps a brief mention of The Assayer of 1623, which Maffeo Barberini, as the new Pope Urban VIII, was to find such acceptable meal-time reading.

But we know that in spite of the 1616 Decree, there was a continuing extension of Galileo's work and ideas, and it is necessary to check the extent to which the Society kept abreast of these.

One would have expected that the Society, in view of its reputation, would have regarded as essential the monitoring of Galileo's Copernican thoughts; if not by public discussion, which was now forbidden, then by some less obvious method. To maintain any claim to scholarship for themselves, it would have been necessary for the Jesuits to refute the implications of Galileo's work in a more philosophical manner than that of the 1616 Decree. It would also have been, at the very least, expedient to be aware of any possible developments in his thought after that date.

Galileo's associations with the "wrong people", as detailed in an earlier chapter,¹ were such that he must always have been subject to scrutiny.

Thus, there are several reasons for thinking that some debate or discussion between Galileo and some Jesuit - or group of Jesuits - continued after 1616.

My method of searching for evidence of this, began with an examination of the papers of the last known public confrontation between Galileo and the Jesuit scholars. These papers were published as The Controversy on the Comets of 1618,² and comprise:

1. An Astronomical Disputation on the Three Comets of 1618,
by one of the Fathers of the Roman College, 1619.
(February 1619).
2. Discourse on the Comets by Mario Guiducci, June 1619.

3. The Astronomical and Philosophical Balance, by Lothario Sarsi, (pseudonym for Father Grassi), October 1619.
4. A published letter, from Mario Guiducci to Father Tarquinio Galluzzi, June 1620.
5. The Assayer, by Galileo Galilei, February 1623.

A close study of these works and complementary material yields some unexpected and, at first, inexplicable aspects of the role of Mario Guiducci. In our current literature Mario Guiducci is known as pupil of Galileo, or disciple, or friend. Further research indicates that the relationship was much closer than this, more nearly that of a friend and colleague. More important, and surprisingly, he was an intermediary between the Jesuits and Galileo to an extent vastly greater than hitherto suggested.

As early as June 1614, Mario Guiducci was firmly established as part of the "school" around Galileo, although the method of introduction is not known. Favaro has suggested that Castelli may have brought Guiducci into Galileo's circle, because it is in a letter from Castelli to Galileo that the name of Guiducci first appears.³ Whatever the manner of their introduction may have been, it was the beginning of a close relationship between Guiducci and Galileo which continued until the latter's death, and indeed Guiducci was the named executor for Galileo's effects.

The Galilean correspondence and allied material which I have studied establishes that a particular kind of dialogue did, in fact, take place between Galileo and certain Jesuits, in the years following the Decree of 1616. This was achieved by Mario Guiducci who, during

those years, moved regularly between Galileo's home and the Roman College. At certain periods the main purpose of the visits to Rome was to discuss the work of Galileo with the Jesuits, and especially with Father Grassi. I hope to show that this two-way traffic of information owed rather more to Jesuit manoeuvre than to the chance journeyings of Guiducci, and that it constituted the dialogue one would have expected to have occurred, with one important difference - this was a dialogue by surveillance.

Father Grassi was the anonymous "one of the Fathers of the Roman College", which is how the author is described on the title page of An Astronomical Disputation on the Three Comets of 1618.⁴

Many of our contemporary Galilean scholars have expressed surprise that Galileo chose to reply to this particular paper, seeing nothing of a provocative nature in Grassi's writing.

"Much more modest, and indeed unimportant, was a discourse delivered in the Collegio Romano, amid great concourse of public by a learned Jesuit, Father Horatio Grassi".⁵

writes G. de Santillana.

W.R. Shea, says,

"His tone (Grassi's) was serene and he said nothing that was deliberately offensive to Galileo whose name was not even mentioned. It is puzzling why Galileo should have singled out this perfectly honest and unassuming address for special attention and criticism".⁶

Stillman Drake holds a similar opinion. He writes that

An Astronomical Disputation on the Three Comets of 1618:

"... deserved no answer, least of all a reply from Galileo, yet it was this pamphlet, selected from scores which had appeared, that Galileo singled out for attention in his remarks".

In spite of these protestations, the fact remains that Galileo did reply to this Jesuit paper. Unless we are to suppose that he worked at random, then we need to examine An Astronomical Disputation on the Three Comets of 1618 for some reason for Galileo's attention.

The Grassi disputation cannot be approached as though it were a scientific paper. We shall find more than analysis and deduction in this work, and indeed in that of Galileo in his subsequent reply. Both Father Grassi's paper, and the Galileo/Guiducci reply, contain in turn a large measure of polemic or persuasion, to be unravelled as much by literary interpretation as by philosophical argument.

The first point of interest may be the question of the anonymity of the paper. It was presented, publicly, at the Roman College by Father Grassi himself⁸ so that Galileo and many of his colleagues and correspondents would be aware of its authorship. The decision therefore to cloak the name of the Jesuit Grassi in the published version cannot be seen as any real attempt at secrecy. A plausible reason for this ploy may well have been to move the onus of authorship from a single member of the fraternity to that of collective responsibility. This was to be the Jesuit or at least, the Roman College view, not merely the view of one particular brother.

And then follows the very strange problem of the verses or invocations which accompany the prologue to Grassi's paper.

ON THE APPEARANCE OF THE COMET

Have you seen the comet with its terrifying tail?
Behold how with its fearsome beard it is carried sky high
But no longer need you fear that stellar body with its
menacing rays

Nor is there harm in those stars which delight us by
 their appearance.
 Tell me, does this phantom glitter as a better and
 more favourable omen
 And does its false light surpass that true fire of
 the stars

OF THE SAME

The vain comet which by its light has disturbed the
 earth and the heavens begins its harmless journey
 With that light bestowed upon it by the creator
 It shrewdly propitiates the adverse celestial
 torches by its equal fire
 May this comet which alters the heavens with its
 ready advantage
 Teach me the nature of the stars. ⁹

These verses or poems, call them what we may, can certainly be seen as mere ornamentation. They may be quotations from some earlier source used at this point by Grassi as being apposite or appropriate to his particular topic; they may be no more than decorative trivia in an age, and in a language, which delighted in such indulgences. However a closer scrutiny yields a more interesting interpretation.

In Chapter 3 I discussed the way in which comets and new stars induced great fear and terror in the popular mind. Father Grassi records, in his Prologue, that at the time of the comet of November 1618 "great throngs gathered on mountains and other very high places, with no thought of sleep ..." Men, he said,

"... had no greater concern than that of observing the sky; if Venus chanced to shine more brightly than usual it was changed into a comet; if at sunset a cloud did not immediately disappear but formed a cross, it was considered as a monstrous thing".

The fears and panic which had permeated the minds of the populace around Ingoldstadt, had been initiated and sustained by minor comets and stars of an earlier period, and in a very different geographical and spiritual ethos than Rome of 1618. Nevertheless, we can sense from the Grassi account that ordinary Romans watching the comet during the days and nights of that particular November, and in the ensuing months, showed the same terrors, the same willingness to read portents of doom in the skies, as those of whom Ambroise had written.

Among a frightened populace there would always be the possibility of greater infiltration by astrologers and magicians. And by this time the new General of the Society of Jesus was becoming well established: Vitelleschi who initiated a programme to negate the effects and power of astrologers.

With this interpretation in mind it becomes easier to understand both Father Grassi's invocation and some of the unexpected statements in his prologue to An Astronomical Disputation on the Three Comets of 1618. It seems probable that neither of these would actually have formed part of the address given by Grassi at the Roman College, but would be added in the printed version which was intended to reach a wider audience of readers, among which would be Jesuits in the problem areas of Europe. To them, and for further dissemination by them, the invocation and the prologue were an attempt to assuage the distress caused by the 1618 comets. The invocation declared, authoritatively, that the November comet which had been visible by night and day, until February of 1619, was not a harbinger of ill-tidings and need not be feared: this was a vain comet on a harmless journey.

We shall see that in the more erudite text which follows the prologue, Father Grassi attempts to recategorise the comet as a planet, albeit a planet of a special kind. In the invocation Father Grassi suggested that the vain comet imbued with light by the Creator has the strength to combat other adverse celestial lights. Perhaps surprisingly, he does not deny outrightly that comets and stars portend doom. Rather he attempts to fight fire with fire by giving this particular comet a quasi planetary status and crediting it with the power to negate the adverse effects of other heavenly lights, this power of course being God given. This disputation of Father Grassi was to be all things to all men; a learned paper for learned men or a panacea for others.

In the main body of the work Father Grassi was very precise in listing the new information which had been found to be acceptable to some of his confrères: the immense distance of the fixed stars; that the moon is blemished, that Venus and Mercury have circular orbits; that there are disfigurations on the sun, and that Jupiter and Saturn have satellites. It does not mention any of the observational statements which Galileo made to support his analogy of the moon and other planets to the earth such as, most notably, the mountains on the moon, or the gibbous phases of Venus.

The author also accepts that the comet may

"teach us something about the stars",

and he proposes

"to consider those things which do not exceed the bounds of our knowledge ..."¹⁰

It is interesting to note at this point, that Father Grassi was quite prepared to read the book of nature in this particular instance, because by his personal reading the message reinforces the decision of the Congregation on the Copernican theory.

The major comet of 1618 was very different from the 1577 comet and enabled Father Grassi to extend some of Tycho's acceptable ideas. From his observations in 1577 Tycho had shown that the comet moved in a circular path which cut the ecliptic about the 21st degree of Sagittarius and this circle was inclined less than 30 degrees to the ecliptic. It was in the eastern part of the sky and, due to its speed relative to the sun, appeared to move retrograde to the planets. Tycho assumed that this comet had been moved by a celestial sphere and had stated that there were several available spheres for just such possibilities as comets. When he estimated the distance of the comet from earth he concluded that it was between the sun and the moon in the region of Venus, suggesting that the comet was indeed a celestial object; although this was contrary to Aristotelian theory.

There had also been noted certain irregularities in the comet's motion, which Maestlin and Tycho had accounted for in different ways; ¹¹ and it was Tycho's theory which was to be a stepping stone for Father Grassi. For Tycho, this inequality could be accounted for either by maintaining uniform motion and an ovoid path, or allowing the possibility of accelerated motion and a circular path. Tycho did not feel the need to choose between these because both he and Maestlin assumed that the comet had been initiated by God

at its first visible point and removed by God at its last visible point. As Tycho said of comets, they mimicked to a certain extent the uniform regularity of planets but did not completely follow it.

In 1618, Father Grassi had a more favourable comet to work from. It appeared to move in a circle which cut the ecliptic at the 14th degree of Scorpio and inclined about 60 degrees to the ecliptic,¹² it was to the west and moved in the direction of the planets. Tycho had suggested that the 1577 comet was beyond the moon in the region of Venus. Father Grassi tried to be more precise about the 1618 comet and concluded that the comet's path "will have to be placed between the two of them", the two being the sun and moon. The argument here is interesting as it shows the method of reasoning.

"Since for those lights which are excited by particular motions there is an established law according to which the more slowly they move the higher they are, and since the motion of the comet was midway between that of the sun and of the moon, it will have to be placed between the two of them".¹³

What seems to be happening in An Astronomical Disputation on the Three Comets of 1618 is that Father Grassi is staunchly building up Tycho's reputation. A very careful and studied reading of all the papers in The Controversy on the Comets of 1618 yields no argument by which the 1618 comet can be either shown to disprove heliocentrism, or shown to support the Tychonic system. Nevertheless, Father Grassi is intimating that the work done in 1577 by Tycho, with minimal time for observing the comet, was sound enough to enable further work to be added in 1618 when additional observations

provided new information.

This decision to build on Tycho's work gives some indication of the dilemma facing those Jesuits who were attempting to build a rational cosmology, following the destructive effects on the Aristotelian world picture of Galileo's observations. For those who had left the world of crystalline spheres behind, it was not possible to maintain the old view. As early as 1611 Father Clavius, who had been shown the astronomical evidence for Galileo's findings, had advised that a new cosmology was now necessary; a point picked up and emphasized by Christopher Scheiner in 1612.¹⁴ At the end of his third letter on sunspots, Scheiner discussed the need for a changed viewpoint, using words of Father Clavius as support.

"... the common teaching of astronomers about the hardness and the constitution of the heavens can no longer be maintained, especially in the regions of sun and Jupiter. It is fitting therefore that we should listen to the leading mathematician of our time, Christopher Clavius, who, in the last edition of his works, moved by these phenomena recently discovered (though ancient in themselves) advised astronomers to start thinking of some other cosmic system".¹⁵

It is interesting to speculate here what this wish of Scheiner, to move away from the Aristotelian account, implies. At the time of his writing, the "other cosmic systems" available were the geocentrism of Tycho or the heliocentrism of Copernicus and of Galileo. Whatever Father Clavius had thought when he had made the statement quoted by Scheiner we can never know. But what of Scheiner's views? It has always been assumed that he did not support Galileo's work, and certainly this is clear in his later writings. There is however that brief inconclusive correspondence between Tanner and Aquaviva

in 1614, in which Tanner requested the General to restrain Scheiner in airing certain non-Aristotelian views. Which "other system" did Scheiner discuss with his colleagues in Ingoldstadt? This is something we do not know at present, but could conceivably come to light from further research into correspondence. Whatever he advocated, the intervention of Aquaviva had a repressive effect, and this may be the point in time, and also the causal factor, when the Jesuits seemed to take the Tychonic theory more seriously.

We shall see how in the papers comprising The Controversy of the Comets of 1618, Galileo ignored direct references to Tycho whilst at the same time carefully refuting the material which Grassi had put forward in Tycho's favour.

In 1619, it is very evident from Father Grassi's work that some Jesuits deemed it preferable to continue the erosion of the Aristotelian cosmology in order to save geocentrism. With the promotion of Tycho and by implication his special version of geocentrism, the Jesuits would have a different cosmology from the old Aristotelian/Ptolemaic view, but one which still incorporated the mathematical theories of Copernicus and one which, above all, was still earth-centred. However, if Tycho's work on the 1577 comet was to become an integral segment of a new approach, then his anti-Aristotelian view of comets as celestial bodies (albeit transient) and his abandonment of the crystalline spheres were also a necessary part of the argument.

Tycho had called the 1577 comet a "real but transitory body". Now in 1619 Grassi attempted to establish the 1618 comet as a real

planet, and in addition emphasized the accuracy of Tycho's measurements.

To the world at large An Astronomical Disputation on the Three Comets of 1618 had stated which of the new discoveries were acceptable; ¹⁶ Grassi had strengthened his own position in the astronomical field by placing the comet in the category provided by Tycho Brahe - "real but transitory". It has been mentioned previously that the precisely mathematical and closely reasoned arguments we might expect in such matters played little part in the cosmological discussions. Grassi employs a strange mixture of mathematics and metaphor. He established by measurement and calculation that the comet was in a celestial position and not sublunary, ¹⁷ that the motion of the comet was constant, ¹⁸ it moved along a great circle and as it showed only slight enlargement when viewed through the telescope it was below the level of the fixed stars. ¹⁹ He then, in order to point to his conclusion concerning the true nature of the comet, moved into poetical syllogism, the premisses for which were - the usual Gods are recognised by their motion and pace (remembering here that the planets are named after Gods), he that moves in the manner of the Gods is considered a God, hence, he asks, does not this comet also reveal a goddess? ²⁰

He also reminded everyone of the power and accuracy of the work done by Tycho Brahe on the 1577 comet, in fact he had gracefully conceded that because of the superior detailing of Tycho's instruments Grassi's own measurements were not so accurate. By implication he was suggesting - or reminding - that the work done by Brahe long before the advent of the telescope had not been outmoded. It is

said that after the 1616 Decree many Jesuits and others turned to the Tychonic system of the universe. I suggest that in An Astronomical Disputation on the Three Comets of 1618 Father Grassi's intention is to ease his readers gently towards Tycho's geocentric system.

To this the Jesuits might well have felt the need for a reply from Galileo. It appears that this was their first attempt to adjust the shattered world picture and it was necessary to ascertain the strength of such adjustment. If Galileo could fault the reasoning or could offer new observational information this would be the best time to know; if he could not, then his written acceptance would complete the new Jesuit account.

The reply to Grassi's work was secured with the aid of Mario Guiducci, and the evidence strongly suggests that without Guiducci, Galileo might not have written on the subject at all.

When, on the 29th November 1618, the third comet of that year, (and the one which was the brightest and was to remain visible longest), appeared, astronomers and scholars across Europe looked to it with the hope that it might yield further information about the universe.

Lectures, books and papers concerning the comet were widely circulated and An Astronomical Disputation on the Three Comets of 1618, from the Roman College was just one among them, put forward in a fairly quiet manner. It is true that there were many people at the initial lecture, but the publication of the paper did not receive any particular acclaim.

There were many correspondents for Galileo concerning the comet, from many parts of Europe, but although he discussed it with colleagues he issued no statement.²¹

Gentle pressure was put on him by the Archduke Leopold of Austria, who visited him whilst in Florence, and who on his return home sent local observational accounts of the comet's progress, requesting the opinion of "the wise man",²² "the sooner, the better". Leopold, as brother-in-law to the Grand Duke might well have expected his wishes to be fulfilled, but Galileo did not comply.

On the 2nd March 1619, from Rome, Gio. Battista Rinuccini sent news to Galileo which may well have been disturbing. He wrote that the Jesuits considered that the track of the major comet showed clearly that the Copernican theory was false and that An Astronomical Disputation on the Three Comets of 1618 would prove this. The suggestion has been made that pique or anger over this point pushed Galileo to retaliation, but this seems implausible. Galileo, in 1619, was still aware how dangerous it would be to defy the Decree.

The most cogent reason for Galileo's reply and one suggested by the correspondence and the published works, was that the Jesuits specifically wanted a reply from Galileo, and he saw an opportunity for using this to his own ends

The Decree of 1616 had prohibited open discussion of Copernicanism, verbally or in writing. This had halted Galileo's promotion of heliocentrism and had alerted anyone else in the Catholic world to be wary in moving away from the Aristotelian world-

picture. What the Decree had not done was to authorise which of the new discoveries, if any, were compatible with the Aristotelian view. Those who had followed the first observational accounts published in the Starry Messenger, and who had accepted the authority of the Jesuit astronomers that these observations were accurate, now knew that the pre-1610 Christian view of the universe had been either false or incomplete.

After 1616 it was quite certain to all that a heliocentric position must not be upheld, but no instruction had been given as to how the shattered Aristotelian picture was to be adjusted. In the absence of such guidance there were still many shades of opinion which had been stated prior to the Decree. These ranged right through from Aquaviva's determination to maintain the old order to Galileo's advocacy of the now forbidden Copernican theory.

All shades of thought between these two extremes had circulated; some published, others through the medium of Jesuit correspondence. If Tanner and Aquaviva wished to stay with the old pre-1610 cosmology, it was not possible to judge how the thoughts of other Jesuits had moved. The Decree had apparently halted discussion of the Copernican theory among Catholic scholars, but had it been possible to halt new directions of thought? Obedience was possible on points of action, but was it possible to order individual perception?

It was not sufficient, merely, to censure the theory of the motion of the Earth, nor to forbid Galileo and all other Catholics from teaching or defending their views; it would be necessary to

refute heliocentrism, to state just which of the new observations were to be accepted and to impose a uniform cosmology.

It may well be that the Jesuits thought they had done this, decisively, with Father Grassi's An Astronomical Disputation on the Three Comets of 1618 and that this was why they needed a reply from Galileo showing that he acceded to Grassi's views and that he could not maintain the heliocentric theory by any new evidence.

Galileo was not immediately willing to give his views and refused to write a paper, until following persuasion by Guiducci he agreed that the young man could incorporate Galilean views in a paper of his own.

Galileo, himself, tells in The Assayer²³ that Mario Guiducci who was by now the newly appointed Consul of the Florentine Academy, having the intention to talk on comets before the Academy wished to include some of Galileo's comments in his account.

In view of the dispute which arose in 1619 as to the authorship of Discourse on the Comets any claims or disclaimers by either Galileo or Guiducci are suspect. However, the work in 1916 by Antonio Favaro sheds some light on the situation.²⁴

A close examination by Favaro of the original manuscripts of Discourse on the Comets, led him to the conclusion that the major part of the work was by Galileo. Favaro was firmly of the opinion that had Guiducci had any part in composing the Discourse on the Comets it was limited to the first pages.²⁵

These first pages instigated by Guiducci were evidently a

sufficient spur to Galileo. The manuscript suggests that the majority of the work was written by Galileo.

It was a neat situation. The Jesuits had produced a definitive account which was intended to be substituted for the old world-picture and they needed to be sure that Galileo would not refute it. However, their account maintained a geocentric theory and if Galileo had had an alternative view supporting the heliocentric theory he had been forbidden to write about it. The Guiducci paper, therefore, must have seemed useful to both parties. If Galileo was not inclined to write a paper himself than at least some of his opinions were to appear in Discourse on the Comets and the Jesuits were never in any doubt that a major portion of the work was that of Galileo.

There was certainly safety for Galileo in this approach, and with his customary cunning he was able to exploit this arrangement to the full. The Jesuits were to get feedback from him, as they wanted, but it did not take the form they expected.

In the following chapters we shall see how Galileo was able to utilise this apparently innocuous paper for the Florentine Academy in order to bring the forbidden topic of Copernicanism once more into public view, and with impunity.

CHAPTER 5 - References

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6. Wm. R. Shea, Galileo's Intellectual Revolution, Macmillan: London 1972, p. 75.
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9. Ibid. Unnumbered page immediately before Prologue to An Astronomical Disputation on the Three Comets of 1618.
10. Comet Controversy, Astronomical Disputation, p. 6.
11. L. Thorndike, History of Magic and Experimental Science, 8 volumes. Columbia University Press: New York 1923-1958, Vol. VI, Chap. XXXII.
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13. Ibid. Astronomical Disputation, p. 17.
14. See Reference 6 of Prologue, and below.
15. The translation quoted here is from Wm. R. Shea, Galileo's Intellectual Revolution, p. 53. A copy of the original can be found in Ed. Naz. Vol. 5, where copies of the correspondence and writings concerning Christopher Scheiner's letters on sun-spots will be found pp. 20-259, the passage quoted being on p. 69. Shea points out that Scheiner did not give a precise

reference in Clavius' work, but he believes this to have been "the concluding section of the last edition of Clavius' Commentary on Sacrobosco's Sphere (Christopher Clavius, Opera Omnia, Vol. III, Mainz 1611, p. 75 of the separately paginated Commentarium in Sphaeram Joannis de Sacro Bosco)".

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CHAPTER 6

Guiducci's Discourse on the Comets

Whatever Father Grassi and fellow Jesuits had hoped for in the reply, nominally Guiducci's, to An Astronomical Disputation on the Three Comets of 1618, Discourse on the Comets was a bitter shock.

Writing in 1654 of the comet controversy, Viviani was to say that this reply by Galileo, cloaked with the name of Mario Guiducci, was responsible for the persecution of Galileo by the Jesuits which continued until his last days.¹

Whilst there was a large measure of truth in Viviani's assessment, it is not the entire case. Certainly from the date of Discourse on the Comets, the Galileo correspondence refers to Jesuit enmity, but in spite of this antagonism there continued to be an element, in the Roman College, apparently interested in Galileo's work for several years. Some hesitancy in the style of Grassi's An Astronomical Disputation on the Three Comets of 1618; the many requests to Galileo for some statement about the comet, which came from all sides including those connected with the society of Jesus; above all, the uncertainty surrounding the general world picture; all these suggest that the Jesuits might have been interested in very discreet discussion.

But discreet discussion was not the way Galileo chose to operate, and with Discourse on the Comets there was more attack than debate. Unfortunately, as hindsight shows us, the intellectual climate which was possibly beginning to lighten somewhat following the harsh

shock effect of the 1616 Decree, would soon harden again. In 1619 there might have been the chance of quiet conference, some possibility of breaching the stringency of the 1616 ban. There were to be one or two more instances when the Jesuits would attempt to engage Galileo's attention, tentative olive branches and even more tentative suggestions of help, but the period of propitiation was very short and passed unfruitfully.

Following fairly quickly came the onset of the Thirty Years' War, the death of Cardinal Bellarmine, and the elevation to the Papacy of Maffeo Barberini; the Jesuit situation was changed, the Society's impetus became channelled ever more directly to Counter Reformation problems: Galileo's chance was soon gone.

What then was said in Discourse on the Comets? There were, of course, many points of discussion but the ones on which Father Grassi might legitimately have taken umbrage was in three major areas.

The first of these was the attack on the suggestion of the comet as a planet. Discourse on the Comets implied that any arguments which Grassi had based on the observation of the comet, and used to enhance the Tyconic account, were groundless because the comet was not a real body, but an optical illusion caused by light reflection on rising vapours.

Secondly, the general tone of Discourse on the Comets was aggravating. Statement after statement from An Astronomical Disputation on the Three Comets of 1618 was subjected to correction, in a manner humiliating for Father Grassi. "Weak", "idle" and "worthless" are just a very few of the comments used in connection with Father

Grassi's work. This was all particularly offensive, when we recall that officially this work was by Mario Guiducci, a scholar with a rather more literary bent than a scientific one, and certainly someone whose intellectual reputation was less elevated than that of the Jesuit. Moreover, Guiducci was a man who had been trained and educated by the Jesuits themselves and with great love and care as Guiducci himself admitted.²

The third problem area was that Discourse on the Comets suggested, and this very covertly, that any observations that could have been made of the comet, had it indeed been a real body, would suggest heliocentrism.

Discourse on the Comets opens with some of the accounts given of past comets by ancient Greek philosophers, and then "the balance of the discourse" deals:

"with the strength of those reasons which at length persuaded the most celebrated astronomers not only to deem comets celestial things, but even to insist that they be necessarily accepted as among the heavenly bodies ..."³

My earlier suggestion that An Astronomical Disputation on the Three Comets of 1618 was to be seen as a composite Jesuit view is partly borne out here by Guiducci's reference to "celebrated astronomers".

Guiducci continues by stating his programme to be that of "Examining":

"principally the basic assumptions of Tycho Brahe, he having criticised the works of others and dealt with these matters in more detail and with more assurance than anyone else. Later, I shall

turn my attention to the Professor of Mathematics at the Collegio Romano, who in a recently published tract appears to have subscribed to Tycho's every statement, and even to have added some further reasoning in confirmation of that opinion." ⁴

At this point the first attack against the Jesuit case is brought to bear. For Galileo, the promotion of Tycho had to be halted, and for that purpose he made the proposal that the comet was the reflection from rising vapours, a surprising adherence to the Aristotelian doctrine on comets. In speaking to the Florentine Academy, Guiducci said that to infer the distance of objects by checking the amount of parallax was a conclusive argument, Galileo had also stated this in 1604 when discussing the new star of that year. ⁵ However, Guiducci emphasised, such method would result in error when applied to ephemeral manifestations like terrestrial exhalations since parallax does not function with mere appearances.

This notion that the comet was "mere appearance" led Guiducci to offer two conclusions: the distance of the comet from the earth could not be judged by any acceptable method, nor would any useful purpose be served by such attempt.

Guiducci repeats this point with several examples, in the manner with which we become so familiar in the later Galileo. The comet, he argues, is caused by reflection like so many other appearances we see. Rainbows, haloes, mock suns, the Northern lights and sunrays catching the edges of clouds, are some of the analogies he draws. But these arguments were surely rhetorical? It is impossible to believe that Galileo was not grossly insincere, particularly when Guiducci says:

"I shall not believe that parallax had really any place in comets until it is first proved that comets are not reflections of light, but are unique, fixed, real and permanent objects." ⁶

This situation was a surprising twist on his work in 1604 and his disagreement with Cremonini. At that point Galileo had urged and advocated the method of measuring parallax to produce measure of distance even in celestial objects. Such extension of measurement into the celestial realm was unacceptable to Cremonini who followed the Aristotelian doctrine of an essential difference between terrestrial and celestial substance. At which point Galileo wrote a semi public dialogue of which Cremonini was the butt. In the dialogue Galileo has a simple peasant make his own point: namely that the substance of the new star did not affect the measuring of its distance, for all mathematicians cared the new star might be made of polenta. ⁷

Had he been challenged on this in 1619, when he refused to accept the possibility of an accurate measuring of the comet's distance since it comprised merely terrestrial exhalations, he would probably have made a good case for polenta having physical characteristics. However, I have not yet seen that such challenge was made.

This tit-for-tat call for proof of the comet as physical body, before acceptance of interpretative theory, was perhaps then a retaliatory nudge to the Jesuits by Galileo following his own problem of proof in the heliocentric theory.

In order to lend weight to his spurious "reflections" argument, Galileo is quite capable of resorting to authority, in the Jesuit

manner. He uses Aristotle as source in recounting one Pythagorean theory.

"And finally, lest our casting doubt be thought captious, or to be done merely to create an objection where none exists, it seems to me that if we will carefully consider what Aristotle tells us about the opinions of the ancients, we shall discover that some Pythagoreans had similar⁸ sentiments about comets ... (as reflections)"

He continues on the Pythagorean theory:

"... they believed comets to be not real objects but mere images and appearances, visible to some people and not to others accordingly as the material in which images were produced was or was not located in a suitable place for reflecting people's vision to the sun." ⁹

This really was "captious" and "done merely to create an objection where none exists". We recall that Galileo, of all people, knew very well that the comet was visible to all during its stay. He had been informed from all parts of Europe of its precise positions and movements, and all these observations had been in agreement.

Discourse on the Comets declares:

"And my occasion for doubt is the greater since perhaps there is nothing among real visible objects which so much resembles a comet as do some of these optical images. I do not know of anything which more exactly resembles a comet than those projections of rays through holes in the clouds, and if time permitted I could adduce many analogies between these and comets." ¹⁰

Quite why Galileo chose to invoke part of the Pythagorean doctrine here is not entirely clear. The Copernican or heliocentric theory had been declared erroneous and heretical, and the term "Pythagorean" was a euphemism or alternative name for the forbidden theory. Introducing the Pythagorean cometary proposition and pointing

out that this particular view on comets is akin to that of Aristotle, would be a subtle way of showing the Aristotelian adherents that on some occasion their master had held similar views to the despised Pythagoras. Or again it may simply have been to remind everyone, in an oblique manner, of heliocentrism, a code word as it might be.

In Discourse on the Comets Galileo was anxious to refute the suggestion of the comet as similar to the planets. To this end the imagery he used for his description was as ephemeral and aethereal as possible.

Tycho's system of the universe had retained the earth as a special type of body, unique and central, surrounded by planets like one another, but totally unlike the earth. Galileo with his observations, first of the moon and its "mountains", and then of Venus and Jupiter, had sought to establish the earth and the planets as bodies of one kind.

Favaro suggests:

"He (Galileo) probably feared, and not without reason, that a comparison of the comets to the planets might be compromising to that analogy of the planets to the earth, not agreed to - on the contrary condemned - by the Rome Congregation; and for that reason he denied resolutely any analogy whatsoever between ... the comet and the planets." 11

It is beyond doubt that the likening of the moon to the earth by Galileo caused many problems for the Church authorities, as it raised questions of people on the moon and implied the possibility of more than one Creation. Galileo had said that although he made the original analogy he was not responsible for the consequential embellishments.¹²

For Galileo the refutation of the comet as a real body was an essential argument in his effort to disrupt the Jesuit attempt to assert Tychonism. Other factors simply did not concern him and he disregarded them.

Discourse on the Comets, which when written was still nominally Guiducci's work, makes no mention that the mountains-on-the-moon analogy was completely missing from An Astronomical Disputation on the Three Comets of 1618 by Grassi, yet we can see that Galileo would be annoyed at this omission. His observations for that particular proposition were as precise as any others he had made and he himself had made no reference nor suggestion that the moon might be habitable or inhabited. This particular argument had seemed important to Galileo. He sought to show that all the planets, including the earth, were similar objects in space; that the long-held distinction between earth as a terrestrial body and other planets as celestial bodies was no longer tenable. He had shown that the moon was like the earth in many respects, and by implication extended earth-like properties to all planets.

If the earth could have been accepted as one of a number of bodies in space, the notion of the earth as a special kind of body intended as a central static point, as a hub for the universe, would become less plausible.

However, and probably because of its sensitivity, the beautiful piece of work on the resolution of the marks on the moon had been reduced by Father Grassi to one statement that the moon is blemished.

For Galileo such omission on his vital argument rendered the debate valueless.

And yet the extreme sensitivity of the issue of the lunar topography had been pointed out to him, from many sides. This point had troubled Father Clavius long after he had accepted all other aspects of the astronomical discoveries. Prince Cesi had warned him in 1611 of a paper deriding the lunar discoveries, by Lagalla; Mark Welser had also informed Galileo that there had been much criticism concerning mountains on the moon. And, as Professor Drake writes, the work concerning the surface of the moon had created more furore than is generally recognised.¹³

In 1612 in the Third Letter on Sunspots Galileo had attempted to set the record straight, agreeing with Apelles that the view which put inhabitants on Jupiter, Venus, Saturn and the moon, was false and damnable.¹⁴ Nevertheless in spite of his declared rejection of such silly stories the lunar work had been barely mentioned in Grassi's work.

Side by side with the theme of comet as mere appearance, there was the rather more personal denigration of the intellectual capability of the author of An Astronomical Disputation on the Three Comets of 1618. This was the second point of irritation for the Jesuits.

A large part of the work details the limiting factors in working with the telescope; perspective is also discussed. The mood set by Guiducci is that the Professor of Mathematics at the Roman College had misunderstood fundamental principles concerning the telescope

and perspective. Therefore, for the benefit of those who had some acquaintance with Father Grassi's paper, Guiducci has decided to set forth the views of "our Academician", with the hope that these views may reach "those very learned geometers too".¹⁵

A close reading of Discourse on the Comets yields so very many slurs on the competence of an eminent astronomer, that we can well believe that the Jesuits became enraged.

Father Grassi's work, throughout Discourse on the Comets, is labelled, "weak", "completely idle", his views "rested on weak foundations", "our Academician" had "contradicted the reasoning and deemed it worthless". Guiducci hoped that "its mistakes may be amended" and "their error may be corrected".¹⁶

One wonders here at the nature of the man Guiducci. We will see at a later stage that he took great offence at the reception of his Discourse on the Comets by the Jesuits, and that it was to become essential for them to re-establish good relations with him in order to continue surveillance of Galileo.

But at this point in 1619 when he was working with Galileo to produce the paper concerning comets which would be read at the Florentine Academy, it is impossible to decide on his position. Could he really not see that this work, to which he was lending his name, could give great offence to Father Grassi and his colleagues?

I have indicated that in its refusal to discuss the possibility of the comet as a real body, coupled with the deprecating manner of writing, Discourse on the Comets was by no means the kind of statement the Jesuits had hoped for.

It is with the third problem raised by Guiducci, however, that the course for their future relations was set.

He had been discussing whether the comet had straight line motion or moved on part of a great circle. Father Grassi had taken the latter view, and Guiducci argued that it was on a straight line. He added:

"I shall not pretend here not to know that if the material in which the comet takes form has only a movement straight and perpendicular to the earth's surface (that is, from the center toward the sky), the comet should appear to be directed exactly toward the zenith; yet it did not appear so, but declined toward the north. This forces us either to change what has been said or else to retain that, but to add some other cause for this apparent deviation. I cannot do ¹⁷ the one, nor should I like to do the other."

The underlining here, is mine, to draw attention to the one point in Discourse on the Comets where some hint of a movement of the earth, other than its diurnal motion, is suggested. And it is only suggestion. A re-reading of the paragraph does not reveal the strands of any argument which if based on the alleged northerly declination of the comet supports the Copernican theory.

It is, however, obvious from the ensuing correspondence and discussion that this was precisely how it was construed. Colleagues and Jesuits alike understood, or believed they understood, that had Galileo not been instructed by the Decree of 1616 to keep silent on anything pertaining to the heliocentric theory he could have used the observations on the comet to support Copernicanism. With this whisper of the comet moving initially as though straight towards the zenith and then declining to the North, it seemed to be accepted

that Galileo might - if so allowed - "add some other cause for this apparent deviation". The Jesuits' hope, that they had given a definitive account of the universe as geocentric, was in jeopardy.

The whole problem was not so much what Galileo had had Guiducci say or argue for: it was that which had not been said. Nevertheless, the hint which had been dropped seemed to suggest that Galileo had further views ready for some future time.

For his friends and followers it was as though he had proven his case, although this he had not done. Of all the writings on the comet, this was the only occasion when the northerly declination following a straight line motion was mentioned. In spite of this, his friends were inclined to think well of Discourse on the Comets. Francesco Sagredo, from Venice, had read the paper twice, and with great attention in order to gain a clearer understanding and the work had "freed him of many doubts".¹⁸

The approval of his friends and admirers was not, of course, shared by the Jesuits. Ciampoli, writing to Galileo from Rome, was well pleased with the contents, though not with the possible outcome:

"If you ask me freely, it said well a thing which does not meet with favour here and it is that which may be taken up by the Roman College ... The Jesuits took much offence against it and they are preparing a reply. What displeases me so much is that the benevolence and approval they felt for you should be so diminished."¹⁹

This letter indicates the feeling that Galileo, in the guise of Guiducci, had dealt an important blow to the Jesuits, but one damaging to himself at least as much as to them.

Favaro has suggested that the Jesuits' ill feeling towards the Discourse on the Comets was principally occasioned by the fact that Guiducci, who was named as the author, had been one of their pupils, and

"they were seeing rise up against one of them, a great scientist whom they esteemed ... and one of their old disciples, in a word two ingrates." 20

The Jesuit wrath, however, when it appeared in writing the following October, was directed wholly to Galileo.

Guiducci, through his close relationship with the group constantly surrounding Galileo - personally or by correspondence, knew in advance of the lecture date that Discourse on the Comets met with their approval. In full self-congratulatory note, he dedicated it to "The Most Serene Leopold Archduke of Austria".

From the letter of dedication which Guiducci sent to Leopold together with the copy, we learn that at this stage, June 1619, he regarded himself as hardly more than an amanuensis.

"The main foundation of this essay of mine being his (Galileo's) opinions concerning comets ..." 21

Here, in contrast to what he will say at a later stage, and also contrary to the fiction which Galileo will maintain, we have Guiducci giving almost complete credit for Discourse on the Comets to Galileo.

Perhaps too, we get a clue to the ambivalent nature of Guiducci. He was to stay with Galileo until Galileo's death, and Discourse on the Comets was to be his only real moment of fame. That he may

have had the wish himself to become a scholar under patronage, as Galileo was to the Grand Duke, is suggested in the letter to Leopold, where Guiducci writes:

"For all these reasons, I have hoped from your beneficence not merely gratitude but protection." 22

If this was Guiducci's hope, however, nothing came of it.

Guiducci's letter to the Archduke was used as a dedicatory preface to the Discourse on the Comets,²³ and copies of the paper were sent, quickly, to many interested parties. These included Cardinal Orsini,²⁴ Federigo Borromeo,²⁵ Sagredo,²⁶ and Maffeo Barberini,²⁷ among others.

To all of them, Guiducci is anxious to give the message that:

"my action has been determined above all by your desire (as shown in your gracious letters to Galileo) to learn his opinion upon this matter." 28

The extent of the ill feeling that the Jesuits (or at least that section of the Society whose prestige was threatened) felt towards Discourse on the Comets, was quickly conveyed to Galileo. Ciampoli - among others - had informed him that there was to be a reply.

That Father Grassi had initiated the reply and regarded it as a personal responsibility is indicated by the fact that he took the paper himself to Perugia for authorisation, in October of 1619.²⁹

In conversation with Ciampoli, a conversation which was quickly passed on to Galileo, Father Grassi did not hide the fact that the reply now published as The Astronomical and Philosophical Balance is his:

"The Father tells me he has propounded his reasons the better to have them known, but yet that he has always treated of you honourably. You will be able to see it all." 30

The title page of The Astronomical and Philosophical Balance,³¹ however, states that it is written by Lothario Sarsi, a strange subterfuge which is continued throughout the work with "Sarsi" in the role of student uttering the views of "my master Horatio Grassi".

There was apparently little reason for this particular ploy. It seems most likely that this was Grassi's attempt to mock Galileo for hiding behind Guiducci, or perhaps it had been suggested to Grassi that it would be more diplomatic to withdraw from a public conflict. Both of these possibilities seem to be negated by the appearance in the text of the paper of Father Grassi's name as the master behind the writer.

For whatever reason, however, that the name "Sarsi" was introduced, the scholarly fraternity knew that it did not apply to any student, but was an anagram of Father Grassi's name.

"Sarsi" dealt directly with Galileo, throughout the work addressing all remarks to him. Since Discourse on the Comets was reputedly by Guiducci such behaviour would seem strange and discourteous to some amongst its fairly wide readership, who might not have known of the relationship between Guiducci and Galileo. Sarsi quickly points out that Guiducci himself has waived claims of authorship:

"then, since the same Mario ingenuously confessed that he, very trustingly, was willing to proffer

what he had not discovered but what he had received from, as it were, the dictation of Galileo, I have determined, not without justice, that my dispute about these matters is with the dictator rather than with the consul." ³²

This play on words was particularly wounding to Guiducci, who was proud of his role as Consul to the Florentine Academy, but of course was a joke designed to please the pro-Jesuit group.

At an earlier stage I asked what was the nature of Guiducci that he could be led into lending his name to the offensive Discourse on the Comets and Father Grassi's opinion here seems to be that Mario was ingenuous and perhaps too trusting.

The three areas of Discourse on the Comets which particularly troubled the Jesuits, are dealt with quite specifically in The Astronomical and Philosophical Balance.

Galileo had sought to lessen the standing of Tycho Brahe, fearful that the Tychonic system might become accepted now that the Aristotelian account was no longer tenable and the Copernican account forbidden

That Galileo's intention had been that of denigrating the Tychonic account is understood by the Jesuits. Lothario Sarsi was able to taunt Galileo, spitefully but accurately. Galileo had accused Grassi of slavishly following Tycho, so:

"But consider, let it be granted that my master adhered to Tycho. How much of a crime is that? Whom instead might he follow? Ptolemy? whose followers' throats are threatened by the out-trust sword of Mars now made clearer. Or Copernicus? but he who is dutiful will rather call everyone away from him and will equally reject and spurn his recently condemned hypothesis. Tycho remains as the only one whom we may approve as our leader among the unknown courses of the stars." ³³

If the Jesuits of the Roman College, hoping that Galileo would lend assent to their earlier account in An Astronomical Disputation on the Three Comets of 1618, had been disappointed at the result, they were now very pointedly indicating that "Tycho is the only one we may approve".

The point of personal intellectual discredit to Grassi, which Galileo sought to establish, is dealt with in detailed fashion. Sarsi tackles every counter argument that Galileo had used in Discourse on the Comets, and it is evident that Grassi's self-esteem had been deeply affected by the manner of Galileo's personal attack. It is to the Jesuit's credit that the retaliation is conducted on scholarly lines, the pettiness of the Galileo/Guiducci paper is not reciprocated, although attention is called to Galileo's manner:

"If Galileo has any doubts, he may recall that he once was honourably received in this Collegio Romano by its mathematicians, and not only at that time when there was a public dispute, regarding the Medicean planets and the telescope, he listened and - with what modesty - blushing at their praises ... Therefore I do not know what reason he has for vilifying the good name of the Collegio Romano so that he calls its teachers unskilled in logic and does not hesitate to pronounce our position regarding comets as worthless and supported by false arguments." 34

This particular quotation is a reference to the publication of The Starry Messenger and the honour and approval Galileo received at the Roman College, both in the public welcome by the Society, and other personal discussions. At that time Galileo had returned to Florence from Venice, back into the intellectual milieu so much influenced by the Jesuits, and where he could reasonably have expected close discussion and dialogue on his work. Sagredo 35

had remonstrated with him at the time for moving back into the influence of "the friends of Berlinzone", (by which phrase he meant the Society),³⁶ fearing that Galileo was moving into an area of potential trouble for himself. Initially it had seemed as though Galileo's judgement of the intellectual situation in Rome and Florence had been better than that of his friend. Now as the dispute concerning comets became more sharply defined, Sagredo's fears appear to have been justified.

This quotation from Sarsi's work encapsulates much of the cause for Galileo's bitterness. It was true that the Jesuits had applauded him at the time of The Starry Messenger, but had gradually withdrawn since.

In this same quotation the Jesuits are, in effect, saying: our views and our logic were acceptable then, why not now? It may be that they too were being drawn into a situation they could not quite resolve.

To the third problem which Galileo raised in Guiducci's Discourse on the Comets Sarsi offered a double attack. Galileo had said the comet moved in a straight line from the earth towards the zenith, and then declined to the north, and had hinted at "some other cause" which he might not mention.

Sarsi was fully aware that with the paragraph suggesting "some other cause" Galileo had retained some mastery in the argument, and that for Galileo and his adherents that had been the hard kernel of his true opinion. Sarsi sharply reminded Galileo that the Decree of 1616 still stood: that in one sense there was no discussion,

the Jesuits had the last word. Galileo's only choice had been that he should be seen to agree.

"But at this point I hear something or other softly and timidly whispered in my ear about the motion of the earth ... It had better be whispered with lowered voice. But if the matter were so, Galileo's opinion would have proclaimed that which is considered as a false foundation by others than he." ³⁷

This is a straightforward warning that the motion of the earth is a forbidden topic, and Sarsi is referring directly to the statement by Guiducci in Discourse on the Comets, previously mentioned, in which it is suggested that "some other cause" ³⁸ could be given for the comet's apparent deviation to the North from its straight line motion. Galileo, through Guiducci, had hinted that if he had not been forbidden to do so he could have provided an explanation of the cometary path. By implication this was the motion of the earth, but although many readers of Discourse on the Comets had understood this to be Galileo's meaning, it had not appeared in the text. Father Grassi would have heard the "timid whispers" about the motion of the earth which circulated among the scholars in Rome and reminded Galileo that had that been his opinion, it was an opinion which had been declared false in 1616. Copernicanism was still a forbidden topic.

Sarsi continued with a paragraph which is casuistry at its best: if the observations suggest a forbidden system then good Catholics "see" only that which is required of them. Guiducci had said that the observations of the major comet showed it to move on a straight line, with the final deviation to the North, Father Grassi had said that it moved as on a great circle. Sarsi now suggested

in The Astronomical and Philosophical Balance that the starting point for discussion was not observation, but the definitive statement for Catholics that the earth is not moved:

"For if the earth is not moved, this straight motion does not agree with the observations of the comet; but it is certain that among Catholics the earth is not moved, and therefore it will be equally certain that this straight motion by no means agrees with the observations of the comet, and therefore must be judged inept for our purpose. Nor do I believe that this had ever come into the mind of Galileo whom I have always known as pious and religious."³⁹

It would not be prudent now for Galileo to stress that this was exactly what had been in his mind.

The wording here is very precise: a statement was not necessarily being made about the physical state of affairs with regard to the motion of the earth. If, at some future date, it became necessary to accept the motion of the earth, it would be seen that The Astronomical and Philosophical Balance had spoken only of the state of belief among Catholics. In 1619, of course, Catholic belief was meant to superimpose physical reality.

The final view of the comet and heliocentrism is given by Sarsi, when he claims:

"If no other motion in the earth were conceived of except that which Copernicus proposed, not even thus would the phenomenon of the comet be saved by this straight motion."⁴⁰

If, with An Astronomical Disputation on the Three Comets of 1618 Grassi had indeed been putting forward a tentative vote for the Tychonic system, The Astronomical and Philosophical Balance has as its main theme the view that there is, in fact, no other system to be considered.

CHAPTER 6 - References

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25. Ed. Naz. Vol. 12. Galileo to Borromeo, 29th June 1619.
26. Ed. Naz. Vol. 12. Sagredo to Galileo, 22nd June 1619.
27. Ed. Naz. Vol. 12. Galileo to Maffeo Barberini, 29th June 1619.
(The letters to Borromeo and Barberini from Galileo being almost the same).
28. Ed. Naz. Vol. 6, p. 41.
29. Ed. Naz. Vol. 12. Ciampoli to Galileo, 18th October 1619.
30. Ibid.
31. Comet Controversy, Astronomical Balance, p. 67.
32. Ibid. p. 70.
33. Ibid. p. 71.
34. Ibid. p. 71.
35. Ed. Naz. Vol. 11. Sagredo to Galileo, 13th August 1611.
36. Starting in Spring 1608, Sagredo had initiated a correspondence with the Jesuits who had left Venice and were now settled in Ferrara. Sagredo wrote under the guise of a gentlewoman from Venice seeking moral guidance, hoping to entice Fr. Possevino to answer. The replies were in fact pseudonymously signed as coming from Rocco Berlinzone, and were written by Fr. Antonio Barisone. 'Amici del Berlinzone' became Sagredo's reference to the Jesuits when writing to Galileo. For a more detailed account see Gaetano Cozzi, Paolo Sarpi Tra Venezia a l'Europa, Einaudi: Torino 1979, pp. 175, 177 and 179.

37. Comet Controversy, Astronomical Balance, p. 98.
38. Ibid. Discourse, p. 57.
39. Ibid. Astronomical Balance, p. 98.
40. Ibid, p. 101.

CHAPTER 7

Guiducci and the Letter to Father Tarquinio

It is through the reaction of Mario Guiducci to The Astronomical and Philosophical Balance that we get the first real evidence that he had been in very close contact with the Jesuits of the Roman College for a long period. We know that he maintained these links throughout Galileo's lifetime, at least.

In June 1620, eight months after the publication of The Astronomical and Philosophical Balance, Mario wrote to Father Tarquinio Galluzzi S.J. In the manner of his earlier letter to Archduke Leopold, and in the familiar ploy of the times, the letter to Father Tarquinio was not from one private individual to another. The purpose of this letter was that it should stand in place of the public reply to Sarsi's paper which Guiducci had been dissuaded from making.

This dissuasion, though kindly conducted, caused great conflict of mind for Guiducci. That he resented the restraint initially and became bitter about it in the ensuing months, is very evident. We learn this, both from the fact that he now chose to break silence, although still partly respecting Tarquinio's judgment, by using the method of the semi-private letter; and from the contents.

The restraint he has felt from the restriction placed upon him, is referred to several times in the first paragraph. Guiducci writes that had The Astronomical and Philosophical Balance been only a defense of Father Grassi's earlier statements about comets,

"I should gladly have conformed to your judgment, most reverend Father, and terminated this dispute by my silence. For with very tranquil spirit, I should without the least anxiety have left the decision to men of science like yourself ..."¹

However, the paper moves beyond this, says Guiducci, "going on to make imputations and biting remarks."²

The Astronomical and Philosophical Balance in fact, as mentioned in the previous chapter, makes no imputation or remark about Guiducci, which Guiducci himself has not already stated in the letter to the Archduke Leopold.

We recall that, to Leopold he had written that the main foundation of Discourse on the Comets was Galileo's opinion on comets, and that in writing it he had been expressly fulfilling requests from those who wished to learn Galileo's views on the matter of the long-staying comet of 1618.

By casting himself in this role of ghost-writer for Galileo, when writing to Leopold, he unwittingly yielded a point which 'Sarsi' would be able to use to advantage. The additional fact that Guiducci had delivered Discourse on the Comets during his term as Consul at the Florentine Academy gave 'Sarsi' the opportunity to dismiss Guiducci from the debate by a neat play on words, that the dispute about these matters was with the dictator rather than with the consul.

This was the imputation and biting remark to which Guiducci objected and to which he referred in the Tarquinio letter. There is no doubt it would cause laughter, at Guiducci's expense, and that not only from the Jesuit side; but it did no more than rephrase his own statements.

The only other comment on Guiducci to be found in the paper allegedly by Sarsi is in the same paragraph as the Consul/Dictator remark, and in the same context. I quote it here to show that although 'Sarsi' was not giving much credit to Mario's own intellectual prowess, it is not in the same category of denigrating comment as that in Discourse on the Comets with regard to Grassi's scholarship.

"... Mario ingenuously confessed that he, very trustingly was willing to proffer what he had not discovered but what he had received₃ from as it were, the dictation of Galileo ..."

We shall see that Mario saw himself as an interpretative link between Galileo and a certain section of Jesuits, who appeared to maintain an interest in Galileo's work. Both the tone of his letter to Father Tarquinio and his subsequent behaviour to Father Grassi support this view. For Guiducci this was a satisfying role, an accolade on his own scholarly standing.

When he had written to Leopold, and distributed the many copies, this initial readership had been men who were known personally to Galileo and to Guiducci, men who had been present at some discussions in the Galilean circle. Guiducci evidently felt that his role of friend and intellectual colleague to Galileo was sufficiently understood among that particular fraternity.

This special nature of Guiducci's role, as Guiducci himself saw it, is lost when the same Leopold letter is read by people who have not known Mario in the Galilean company. The interpretative role is then reduced to that of "copyist". For Guiducci the words "dictator to consul", "ingenuous", and "trusting", are demeaning to his scholarly status.

Two further reasons why Guiducci is aggrieved by the new work by Sarsi become clear from the Father Tarquinio letter.

Earlier, I have pointed out that Guiducci knew before the lecture at the Florentine Academy that Discourse on the Comets, which was already known to the Galilean group, was approved by them.

It appears, from the Tarquinio letter, that Mario had believed that he also had the approval of at least some Jesuits.

As he pointed out to Father Tarquinio:

"... before making that discourse in the Florentine Academy, I had given it into the hands of many learned men, among whom there were some who were closely connected with the Fathers of the Society not only by friendship but even by kinship, with permission to take out of it anything which appeared to them likely to aggrieve any person, or which seemed to them to be prejudicial to anyone." 4

In delivering Discourse on the Comets at the Academy, Guiducci felt he had taken no risk of offending anyone.

Certainly not the Jesuits, because as he says in the same letter:

"I had ... deeply at heart the reputation and dignity of the Collegio Romano, in which I was brought up as a youth, with incredible and paternal love, ..."

And he had made sure, through indirect but certain channels, that the Jesuits knew the contents of his paper prior to its public disclosure at the Academy.

This leaves us with a problem. If Guiducci had offered the pre-publication draft of Discourse on the Comets for covert Jesuit

scrutiny, any displeasing remarks and statements should have been pointed out. But this did not happen, and Guiducci appears to have been genuinely surprised and agitated at the displeasure shown by Grassi and other Jesuits after the publication of his work.

A clue, towards a possible explanation, may be found in the work of Antonio Favaro. His study of Discourse on the Comets, manuscripts extant, was done in order to decide the question of authorship, was it Galileo or Guiducci? He found the manuscripts were of three categories. Some were in the hand of Guiducci, with corrections and additions by Galileo, and comprising the first quarter of the finished discourse. A second group, continuation of the above, are all in the hand of Galileo. The last group, written by Guiducci, is another draft of some of the material found in the second group, and which also has corrections inserted by Galileo.

This, of course is a comparison of handwriting only, and does not necessarily indicate the author of any group. But, faced with all the existing documents of Discourse on Comets Favaro says:

"Confronted by the two drafts between them, together with the one published, it appears⁶ evident that Galileo's is the main one ..."

However, Favaro suspects from the progression of the manuscripts, that Guiducci, at some point, was re-writing the manuscript in order to arrive finally at a single draft in his own hand.

These manuscripts in varying forms indicate the possibility of discrepancy between those finally delivered and subsequently

printed as Discourse of the Comets, and the sections relayed "into the hands of many learned men" connected with the Society of Jesus. In fact a completed copy may never have gone along the line of communication which Guiducci so clearly thought he had established.

The second of the reasons revealed in the Tarquinio letter, for Guiducci's annoyance at The Astronomical and Philosophical Balance, is connected with the first. He appears to have taken all possible precaution not to offend the Jesuits, and yet somehow he has managed to do just that. He does not attribute this to his own initial neglect, and is apparently puzzled by some change which seems - to him - to have taken place in Jesuit policy.

From the Tarquinio letter we understand that prior to Discourse on the Comets, Mario has had clearance, as it were, from Father Tarquinio himself, not only to write an answer to Father Grassi's An Astronomical Disputation on the Three Comets, but permission to take an opposing side in relation to its main section: "Problem - To investigate the nearly true distance of the comet from the earth".

Now, it appears to Guiducci, that Father Grassi's displeasure as shown in the work nominally by Sarsi (and of course indicated through other channels), is occasioned solely by the attempt to argue for a different viewpoint. There is "no sting" in his Discourse on the Comets says Guiducci:

"unless merely having differed from Father Grassi has been held to be a shame and an injury. But this is absolutely denied by the Fathers, for I

have unquestioning faith in what your Reverence signified to me - that every man being free in this sort of matter to adhere to either side, no prudent person would take it ill or deem it a malicious affront for me to dissent from the Problem, provided that I did not exceed the bounds of disputation." 7

"Within the bounds of disputation" as used in the Roman College, meant that it was possible for someone to dispute in an argument against the general view, it being understood that the disputant was arguing for an hypothetical or probable case. Often the one to take the role of disputant was elected.

Guiducci feels he has not exceeded these bounds. The important point here, however, is that Guiducci had felt the need before Discourse on the Comets to take advice from Father Tarquinio on what would be the Jesuit feeling toward someone taking an opposing position, in public debate.

After taking such care not to offend, Mario feels that he was ill-advised. In fact, the source of Grassi's offence at Guiducci's reply was probably not so much that Guiducci had opposed Grassi's arguments, but that the arguments were described by the Galileo/Guiducci duo as "weak", "completely idle", and of "worthless reasoning". Without doubt, when read in context, these descriptions appear to be saying something about the man Grassi, rather than of his arguments. This was precisely the area that Guiducci had not taken care of, and it is possible that in the process of correcting and updating the manuscripts Galileo's ingenuity was responsible for late inclusion of offensive additions to the final draft.

In addition to this personal area in which both Grassi earlier, and now Guiducci, have taken offence, there is the added problem

that some of the propositions in Discourse on the Comets have touched on sensitive areas for the Jesuits. Guiducci had been made aware of this by The Astronomical and Philosophical Balance and discusses this in the Tarquinio letter.

Although in his writing it was clear that Sarsi had not been happy that the notion of comet as a real planet should have been denied in Discourse on the Comets, Guiducci is aware that this denial was not the major worry to the Jesuit group. With confidence then, he reinforces this point in the letter:

"To say with Tycho that some such heavenly condition suffices to those imperfect stars, which although defective, have a natural inclination to every manner and custom of the skies, savours much more of poetic grace than of scientific soundness and rigour, and deserves from you no consideration whatever, since Nature takes no delight in poetry." ⁸

Well aware, however, that the statement which had been most worrying to the Jesuits, namely that the comet moved in a straight line towards the zenith and declined sharply to the north, Guiducci is now hesitant on this point. He is anxious to restore his own reputation.

"Not unlike this trick is his saying that I affirm the comet to be not a real thing but only an apparition, and that it moves with a straight motion perpendicular to the earth; these two propositions I adduced only dubitatively." ⁹

The doubt, indicated in the phrase I have underlined, has suddenly appeared in the letter to Tarquinio. Reference to the original passages in Discourse on the Comets shows that the proposition, that the comet was appearance only, was a strongly argued view,

designed to convince the readership that this was in fact the nature of the comet. With regard to the second proposition that the comet moved towards the zenith in a straight line and then deviated sharply northwards, this was stated to be as observed.

However, in spite of the certainty with which these two propositions were invested in Discourse on the Comets, discretion is now the better part of valour. Mario had put them forward "only dubitatively".

"Nor did I affirm more than this of the straight and perpendicular motion of the comet from the earth, saying only that with such motion the obstacles would disappear or be smoothed out which at every step impede those who assume Tycho's cometary one." 10

This is an extremely subtle change of pace. In the passage just quoted, the implication now is that the inclination to the North by the comet permits an anti-Tychonic view. Earlier in the Discourse on the Comets the emphasis is stronger: the inclination negates the Tychonic system.

The Astronomical and Philosophical Balance had spelled out very definitely, that the only possible explanation of the comet's alleged northerly declination would be motion of the earth, which is a forbidden view. Mario has heeded the warning and is anxious that his retraction from physical certainty to "dubitative proposition" should be on record.

The letter to Father Tarquinio was, naturally, from Guiducci only: it tells us nothing about Galileo's views, although twice Mario tells us of a treatise in reply to Sarsi being prepared by Galileo.

This would be, eventually, The Assayer, which did not appear until two and a half years later. Galileo, too, knew when to be discreet.

An important outcome of the Sarsi paper was that Guiducci and Father Grassi appear not to have spoken to one another again until August 1624 and in Chapter 9 it will be shown that this was by Guiducci's instigation.¹¹ Although Grassi was the senior man, both in age and rank, Guiducci went out of his way to retain a breach between them.

The reasons for Guiducci's personal displeasure following the publication of Sarsi's work became clear only when read in conjunction with his letter to Father Tarquinio. We have no similar document by Galileo, with which to check his reaction to The Astronomical and Philosophical Balance.

Not until February, 1623, with the appearance of The Assayer was there any public sign of Galileo's thoughts on the work of 'Sarsi'. Although the length of time, which elapsed between Sarsi's paper and The Assayer, indicates that Galileo was taking great care before publishing in his own name.

He must, however, have felt some small amount of self-congratulation. The Decree of 1616 had rejected the Copernican issue on a point of faith, and not by a refutation of observational evidence. Intellectually and theologically, this was unsatisfactory.

Father Grassi's first paper on the comet had sought to rectify this situation by suggesting the 1618/19 comet was compatible only with a Tychonic account, the implication thus being that heliocentrism was scientifically untenable. Now, following Guiducci's

Academy lectures, Sarsi's paper showed that the Jesuits had been pushed back to their post-Decree position, namely that:

"... it is certain among Catholics that
the earth is not moved ..."

and that any evidence which cannot be fitted into this account is to be disregarded.

Mindful of their great reputation for scholarship, this cannot have been pleasing for many Jesuits. The probabilistic views expressed in Cardinal Bellarmine's letter to Foscarini in 1615 required no addition so far as they were concerned. To have been able to discuss Copernicanism as an hypothesis until such time as both proof and scriptural compatibility had been achieved, would have been the preference for some of the Roman College scholars in 1619.

In studying the comet debate, we are forced to the conclusion that Galileo particularly wanted it to be seen publicly, that the Jesuits were having great intellectual difficulty. The faith and the 16th century neo-scholastics' world picture had become so intertwined, that the huge breaks in the Aristotelian account were almost certain to be reflected in the faith. The faith, of course, had never been dependent on that particular world-picture, but it had been well satisfied by it, and for many Catholics satisfaction gave more certitude than did logical dependence.

In 1597 Galileo had written to Kepler that he had accepted the physical reality of the Copernican universe many years previously.¹² The process of separating faith from the world picture had, therefore, had time to mature in Galileo's thought, unlike those, for whom the process may have begun only after the Starry Messenger in 1610.

The Jesuits, possibly more than anyone else, had wanted to adhere to Aristotle's account in cohesion with the faith, and were unable to hold it together. This was the point that Galileo was intent on exposing. For a possible explanation of this intent we must look back to June 1610. I have suggested that when Galileo moved back to Florence, he was deliberately moving back into the Jesuit sphere. He returned in spite of warnings from friends, probably because he knew of the Jesuit influence in deciding intellectual matters. For him, this was the time to launch the Copernican world picture, and for this he needed both discussion of his work by the best scholars in Europe, and a process whereby his writings and evidence could be widely disseminated. The Society of Jesus, with educational establishments throughout Europe and with outposts in the remoter parts of the known world, was the obvious choice.

Initially, his return to Florence appeared to have been a wise decision. The Jesuits had encouraged him, discussed and accepted his observations as we know.

And then had been the period of withdrawal, so that through the period of the Colombe/Caccini machinations ¹³ the Jesuits had given no support, in spite of the fact that Galileo was being attacked by their arch enemies the Dominicans. When the Decree was finally delivered, Galileo must have felt he had cause for bitterness.

Bitterness on Galileo's part would explain both the personal attacks on Father Grassi's scholarship and his determination to

expose the intellectual problem of the Society.

As a result of Discourse on the Comets and The Astronomical and Philosophical Balance, the scholars of Europe had been reminded of the Copernican issue, and not apparently by Galileo.

Although it was known and understood that Galileo was the man behind the scenes, the initial moves had been seen to be made by Guiducci. However "ingenuous" or "too trusting" Guiducci had been, he was nominally responsible for the statement that the comet travelled towards the zenith and then declined sharply to the north. With great care and cunning, Galileo had had Guiducci emphasize that he would not offer or discuss a cause for this deviation, thus ensuring that Discourse on the Comets did not - itself - move into forbidden territory.

It is certain that Galileo, aware of Guiducci's close relationship with the Society, had some satisfaction that through Mario, Sarsi, the Roman College representative, had been induced to discuss the comet in relation to the Copernican system.

Naturally enough, Sarsi attempted to show that whatever "other cause" Galileo had in mind to explain the deviation of the comet, the motion of the earth cannot be the answer simply because it is not allowed to be. Nevertheless Sarsi, unwittingly, had also reinforced the idea that the motion of the earth was the only solution which sprang to mind. And he could offer no other.

In the interests of accuracy, it must be remembered that it is not at all certain that other observers accounted for the comet's

movements in exactly the same way as Galileo in the Guiducci paper. Kepler's diagram of the comet's track, for instance, shows a gradual curve rather than a sharp deviation.¹⁴ For many scholars, however, who were interested in the Copernican debate only in a general fashion, Galileo was considered to be an observational authority. There was every justification for such a view, his early work with the telescope and his victory in the sunspot debate had earned him great acclaim.

de Santillana has suggested that The Assayer, written in reply to the Jesuits' The Astronomical and Philosophical Balance, was put forward by Galileo:

"... to cover Guiducci and to vindicate the honor of science ..." 15

Speed is usually an essential part of defence, yet speed was singularly lacking in producing The Assayer if it were to defend Guiducci. Since it was already in preparation six months after the issue of The Astronomical and Philosophical Balance, (according to Guiducci in his letter to Father Tarquinio Galluzzi), the additional time before its appearance - a period of twenty more months - was probably due to wariness on the part of Galileo, for which there was real need.

We have also seen from an analysis of Guiducci's paper, and Sarsi's reply, that in fact Guiducci was not in need of cover from Galileo. Guiducci's contribution had been disregarded by Father Grassi.

Nor can we see Discourse on the Comets as a scientific document,

with The Astronomical and Philosophical Balance suspending observational evidence in favour of belief. Both papers were guilty of the traditional philosophical error: that of 'arguing through', each paper being a monologue for a viewpoint to which its author is totally committed. They were not two papers forming a dialogue or genuine debate.

If in the 'Sarsi' paper Father Grassi, the real author, rejects evidence because it may point to the motion of the earth, Galileo also, in Discourse on the Comets, rejected evidence of the comet as a moving body because it suited his purpose better to suggest that the comet was vapour.

Father Grassi, as well as Galileo, knew the proper method of debate in matters of natural philosophy, but neither of them was in the position of being able to use this in the matter of heliocentrism.

With regard to The Assayer, when it duly appeared, it is certain that Galileo, being a man who did most things in a calculated and purposeful manner, had timed its delay and its subsequent appearance for purposes of his own.

In August 1623, Maffeo Barberini, aged 55, was elevated to the Papacy as Pope Urban VIII. In October of the same year, Galileo, quick to take advantage, dedicated The Assayer to the new Pope. But it is important to understand that The Assayer did not make its appearance in response to a new intellectual atmosphere now surrounding the Papal chair.

The Imprimatur on The Assayer is dated February 1623, and

the shock waves were spreading in the Roman College long before August and the new Pope.

The Assayer was written in the form of an open letter addressed to Virginio Cesarini, a member of the Lincean Academy, and who also - more significantly - was Chamberlain to the then Pope, Gregory XV. This open letter was of a different category from the very public "private" letters which were a feature of the times, and of which Guiducci's letters to the Archduke Leopold of Austria and to Father Tarquinio Galluzzi are examples.

Galileo's open letter was intended for wide publication, and submitted for licencing to Nicolo Riccardi. Bearing in mind the confidential nature of Cesarini's role in the Papal entourage, however, it is probable that Galileo and Cesarini were hoping that it might be instrumental in persuading Gregory XV to rescind or remit the 1616 Decree.

By 1623, there was a small group of firm Galilean adherents, in and around the Papacy.

These were men who had been interested in Galileo's work from the 1610 to 1616 period and who were now in 1622 and 1623 in responsible and influential Papal positions. Of this group were Cesarini and Ciampoli, both men fervent in the cause of furthering Galileo and his work, and as we shall see close colleagues and advisers to Galileo. Cesarini, as mentioned, was Chamberlain, with Ciampoli as a Papal secretary.

In a later Papacy, that of Barberini, they would both move higher on the pyramid of Papal influence. Cesarini would become

Maestro di Camera, Ciampoli would be Cameriere Segreto. ¹⁶

Ciampoli and Galileo were particularly close friends. Ciampoli had been one of the group in Rome in 1611, who had attested to seeing the Medicean planets through the new telescope, and for many years this Jesuit educated Florentine had been the intimate friend and confidant to Galileo. In this context it is perhaps worth noting that with Jesuit educated friends like Ciampoli, and Guiducci too, Florence was in no way the hostile territory which Galileo's Venetian friends had feared.

That Cesarini and Ciampoli, who had affection and esteem for Galileo, were moving closer to the source of power, can be seen as one of the reasons for the particular timing of The Assayer.

As early as August 2nd, 1620, in a letter to Galileo, Ciampoli shows us that it was he who was attempting to stage manage the manner of the response to The Astronomical and Philosophical Balance. His had been the suggestion that it should take the form of a letter to Cesarini and now he is able to tell Galileo that this will be in order.

"I have read your letter to Sgn. Virginio and I give you his gratitude for the honour you propose to offer him." ¹⁷

In June of 1620, when Mario Guiducci had written to Father Tarquinio, he had said that Galileo's reply to Sarsi, was already in progress.

That this had been the case is substantiated in Ciampoli's August letter, from which we can gather that at least one part of the work which would eventually be The Assayer had been seen and

discussed by Virginio Cesarini and Giovanni Ciampoli, and their views then relayed to Galileo.

These seem only to have concerned the etiquette and style of how to refer to the author of The Astronomical and Philosophical Balance, but it indicates how - even from the early stages - Ciampoli and Cesarini were holding a watching brief on Galileo's new work. Ciampoli was particularly keen to see it completed and published.

Galileo, however, was not to be rushed, and the timing of The Assayer's appearance was his own. The intellectual ambience in Rome at the end of 1622, when he finally declared his work to be completed, was much better suited to his purpose than in the summer and autumn of 1620.

The most important change was in the Papacy. However influential Cesarini and Ciampoli might have been in Pope Paul V's household, it was improbable that under the Borghese Pope the 1616 Decree would be rescinded or remitted. But on February 10th, 1621, Cardinal Alessandro Ludovisi became Pope Gregory XV, and in a new Papacy anything could happen.

It is not at all improbable that Galileo might even have been waiting for just such a change, that would have been quite in keeping with papal politics. Those not in favour in one papacy, might well find their fortunes rising in the next one. We have seen already, in Chapter 4 that Cardinal Bellarmine's Controversiis de Haereticos put on the Index by one Pope, was - within ten days - removed by the newly elected Pope. We might even hazard a speculation at this point that Cardinal Bellarmine, with his own case well in mind, had suggested just such a possibility to Galileo.

Paul at 69, would not necessarily be considered an old man, but Pastor has shown that the next papal conclave was thought of as being imminent.¹⁸ Signs of the Pope's illness were not discussed or mentioned in the "Avvisi" (which were a simple daily account of the Pope's activities), but there is some evidence that it was known.¹⁹

Within five days of his elevation Gregory installed his nephew Ludovico Ludovisi as Cardinal, and the new Cardinal Nephew played a major role in papal affairs of state. He was an extremely able, very bright twenty-five year old, and in addition to his state duties he took a keen interest in literature and general culture.

From the beginning, the Ludovisi Papacy would promise a favourable prospect for those who wished to see Galileo's work restored to full discussion and debate.

Gregory XV was the first Pope to have been Jesuit educated, at the Roman College. Both he and the cardinal Nephew who had also been educated by Jesuits, retained a deep affection and respect for the Society. Throughout the short Papacy Gregory and the Cardinal Ludovisi both used and promoted the Jesuit cause. That this affiliation was due more to their admiration of the forward moving spirit of the Society than simply to personal ties, is suggested by the respect which Pope and Cardinal Nephew extended to other new reforming orders. We shall see that Gregory was innovative in religious matters.

The position occupied by Cardinal Ludovisi as nephew to the Pope, a role of confidant and mediator, was accompanied as in all

papacies by the accumulation of great wealth. It is in the immediate recycling of at least part of this wealth that we can see where papal favour fell in Gregory's reign. In this particular papacy, Pope and Cardinal Nephew were of one mind.

In 1623 the Cardinal Nephew had a church built for the Barnabites, in Rome. For the Oratorians he funded and organised the building of two churches, one at Casale outside Rome, the other in the Valtelline. The latter churches for the Oratorians were by way of acknowledgement of that Order for their conversion work in the Valtelline, the crucial pass over which France and Spain had fought politically and militarily for so long. He gave a piece of land from his own estate, The Villa Ludovisi, to the Capuchins for a new convent, and to the Jesuits he gave money, works of art and built a chapel to St. Ignatius.

Throughout his Papacy, Gregory sought for ways to bring about a reconciliation between the Society of Jesus and the State of Venice. The continuing temporal autonomy of Catholicism in Venetian territory became an ever greater challenge, one which the Pope felt could be met by the Society if it were to be resettled in Venice. Where the Society was ensconced, there too were the Jesuit schools, teaching not only future clerics, but also future administrators.

This latter group in ensuing years could eventually permeate the temporal regions of Venetian administration and help weld these to the Church. In France, too, there was hostility to Jesuits and a subsequent slow spread of their schools. No doubt with this example in mind Gregory XV maintained a steady pressure for Jesuit reinstatement.

ment in Venice, but without success.

Gregory's attitude to heresy was very different from that of his predecessors. Although under his rule further prohibitions were made against heretics, and he urged greater stringency in the matter of the Index, he was known to have a kinder attitude to those suspected or guilty of heresy.²⁰ This had been evident throughout his career, when on several occasions as legal envoy he had been sent to different courts of Europe to settle disputes with the Papacy. More than one of these conflicts had ended without the expected excommunication due to Ludovisi's skill and gentleness in suggesting honourable compromise.

In 1621, Galileo may have entertained hopes that The Assayer when finished and forwarded to Cesarini might induce the Pope to diminish the stringency of the 1616 Decree: at least to the extent that his work might be thoroughly reviewed. If these had been Galileo's hopes there were certainly sufficient pointers in the papacy of Gregory XV to suggest the possibility that they could be fulfilled.

Gregory's reactions to heresy would be a persuasive factor, as for example his leniency in the case of Marcantonio de Dominis, former Archbishop of Spalato.

In 1616, de Dominis, a friend of Sarpi, had, following his flight to London, converted to Anglicanism, and in 1619 he compounded his heresy by endorsing a major work of Paolo Sarpi, A History of the Council of Trent.

This work purported to make public alleged documents and letters

concerned with the administration and discussions of the Tridentine council, a work which the English Ambassador to Venice, Dudley Carleton, had felt would be a vital aid to the cause of Protestantism. Consequently he had alerted the Archbishop of Canterbury, George Abbot, to the existence of Sarpi's manuscript, and in 1618 the Archbishop sent Nathaniel Brent, a trusted colleague, to Venice to take a copy of the work from Sarpi. It was then passed along a line of Dutch merchants to England, where it was to be printed.

At this point de Dominis inserted as a preface a letter dedicating the book to James I.²¹ The full title, as published by de Dominis, shows the role for which it was intended: A History of the Council of Trent: an exposition of the artifices used by the Roman Curia for the purpose of preventing the divergences in its dogmatic teaching to be made manifest and the reform of the papacy and the Church from being discussed.

The book, naturally enough, caused a furore, and soon went into several languages and editions. For the Protestants, it was an important step forward. Their great scholars of the sixteenth century had studied and researched to show that the claims of the Catholic Church, to be the true church, could not be substantiated historically. Flaccius Illyricus' work The Centuries of Magdeburg of 1559 had been the high point in this endeavour. Its crusading impact for the Protestant movement, however, had been lessened by Bellarmine's de Controversiis of 1593, and further by the increasing moves to centralisation of the Church and its growing effectiveness following the gradual implementation of the decrees of the Council of Trent.

The work by Sarpi was the first in its field and was not followed by either a denial from the Roman Church or a differing version and its validity as a historical document was not challenged until much later.²²

In view of de Dominis' defection to Anglicanism, his leading role in introducing Sarpi's A History of the Council of Trent as a weapon for the Protestant cause, and his own bitter writings against the Catholic Church, it is astonishing that not only did he later declare his wish to return to catholicism and to Rome, but that in 1621 Pope Gregory XV should facilitate such return and should apparently welcome him.

Through the mediations of the Spanish Ambassador, de Dominis was escorted to Rome, having abjured his heretical views in Antwerp. Once in Rome his pardon was granted on condition that he made his abjuration public in some printed statement, and this was done in 1622.

Such gentle treatment was remarkable, but the Pope answering his critics, remarked "that since, up till then, little had been achieved by proceeding against heresy with fire and sword, he thought it right to try the way of leniency".²³

Throughout 1621 and 1622 there was further evidence that this Papacy of the Ludovisi had a new, enlightened air. In March of 1621²⁴ Rinuccini remarked on this in a letter to Galileo, predicting that the Ludovisi papacy would be more favourable to science and geometry than the preceding one had been.

Shortly after his election to the Sacred College, the Cardinal Nephew inaugurated the Accademia dei virtuosi, which comprised regular meetings of writers and scholars to discuss topics on points of exegesis or areas of general interest.

Some of the titles of these topics, listed by Dr Pastor from the relevant Avvisi of 1621 and 1622, include "Upon good and bad princes", "On good and bad luck in moral senses", "On adulation", "The creation of light", "The necessity of philanthropy", "Magnanimity of Princes", and in October of 1621 (and possibly of interest to Galileo if he heard about it) Mgr. Spinola "On the words of Job".²⁵

During this papacy, the Congregation for the Propagation of the Faith, ever since known as Propaganda, was formally founded. This was a project mooted under successive Popes, to centralise the work of the missions. It had been initiated in 1599 under Clement VIII as a Congregation of Missions, but had later fallen into abeyance. With Gregory XV, the organisation was finally set up, largely in the format which still exists, on January 6th, 1622.

Thirteen cardinals, two bishops and a secretary formed the Congregation, which was to meet together in the home of a senior member twice in the month and for a third time in the presence of the Pope. The Congregation, from its inception, was to be autonomous, only exceptional matters needing the Pope's decision.

All the enlightenment, the spiritual cleansing, the intellectual approach to unsolved problems of dogma and ritual, which typified these Ludovisi, Pope and nephew, was caught and retained in the constitution of the Propaganda.

The Cardinals included two non-Italians, Borgia from Spain and Eitel von Hohenzollern from Germany, and eleven from different Italian states: Sauli, Farnese, Sourdis, Cobeluzzi, Valiero, Sacrati, Ludovisi, Bandini, Barberini, Ubaldini and Millini, the last four being Florentines. The secretary to the Congregation was Francesco Ingoli.

Already in 1622 the Florentine group, with whom Maffeo Barberini surrounded himself on his own elevation to the Papacy in 1623, was flourishing and had a weighty spearhead in the Congregation. The cross linkages between the Florentines and other members of the Congregation, which would consolidate possible Florentine influence were many, and extended out to encompass the intellectual group in which Galileo was a major force and delight.

Barberini and Ubaldini, like the Pope and Cardinal Nephew, were Jesuit educated, a source of many shared experiences and acquaintances. Of the two bishops, Giovan Battista Aguchi and Giovan Battista Vives, Aguchi had been on a papal mission with Barberini in 1604, and shared common interests. Aguchi, although from Bologna, was himself a "co-opted" member of the Florentine group of some years standing, having met Galileo through the introduction of Luca Valerio. Valerio, mathematician, had himself been a member of the Lincean Academy until his expulsion for unworthiness in failing to offer a defense of Galileo after the Decree in 1616. ²⁶

Farnese, one of the longest serving members of the College of Cardinals, had some attachment to Barberini, who shortly after the beginning of his own Papal reign as Urban VIII showed his

favour to Farnese by bestowing on him a further lucrative bishopric.

Cardinal Hohenzollern was a staunch Copernican, and in a later Papacy - that of Barberini - promised Galileo that while in Rome in 1624 he would discuss the Copernican issue with the Pope before returning to Germany.²⁷

Thus this loose affiliation of members of the Congregation surrounding the four Florentines extended in differing ways to a half dozen other members.

There is no suggestion, here, that this group wielded, or even attempted to wield, undue influence in Congregation matters, but looked at purely from Galileo's presumed viewpoint it must have seemed as though at long last "his kind of men" were in authority. The scope of the Congregation was wide, its brief being "to deliberate on and to take action in everything that concerned the spread of the gospel in all parts of the globe".²⁸ There were no initial limitations on which matters could be scrutinised in this respect, and in 1622 there would be reasonable grounds for Galileo to hope that this might encompass the effect of the new world picture on the propagation of the faith to Protestant countries. Renewed enquiry into his own work could possibly be an outcome of the new Congregation's meetings.

Late summer of 1622 saw Galileo moving quickly towards publication of The Assayer, pausing now only for Ciampoli and Cesarini to check his work for possible offence.

CHAPTER 7 - References

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2. Ibid. Tarquinio letter, p. 135.
3. Ibid. The Astronomical Balance, p. 70.
4. Ibid. Tarquinio letter, p. 142.
5. Ibid. Tarquinio letter, p. 142.
6. Favaro on Guiducci, p. 1369.
7. Comet Controversy, Tarquinio letter, p. 143.
8. Ibid. Tarquinio letter, p. 144.
9. Ibid. Tarquinio letter, p. 144.
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11. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th September 1624 and Rinuccini to Galileo, 10th August 1624, verifies the reconciliation.
12. Ed. Naz. Vol. 10. Galileo to Kepler, 4th August 1597.
13. G. de Santillana, Crime of Galileo, Heinemann: London 1958, Chapter 2.
14. J. Kepler, Gesammelte Werke, Beck, München 1937-69.
15. de Santillana, Crime, p. 155.
16. Pastor, History of the Popes from the close of the Middle Ages, Kegan Paul, Trench, Trubner and Co. Ltd.: London 1941, Vol. XXIX, p. 45.
17. Ed. Naz. Vol. 13. Ciampoli to Galileo, 2nd August 1620.
18. Pastor has said that towards the end of 1620 the signs of age were obvious in Pope Paul V. In support of this he quotes Nicoletti in Vita d'Urbano VIII, who states that Paul V

suffered from senile gangrene. History of the Popes, Vol. XXVI, p. 372.

19. Pastor, History of the Popes, Vol. XXV, p. 339.
20. Ibid. Vol. XXVII, p. 105.
21. Gaetano Cozzi has shown the manner of transmission of Sarpi's manuscript to England and that de Dominis played no part until the book was prepared for printing. See Gaetano Cozzi, Paolo Sarpi tra Venezia e l'Europa, Einaudi: Torino 1979, pp. 271-279.
22. Pastor, History of the Popes, Vol. XXV, p. 211.
23. Ibid. Vol. XXVII, p. 107.
24. Ed. Naz. Vol. 13. Rinuccini to Galileo, 27th March 1621.
25. Pastor, History of the Popes, Vol. XXVII, p. 70.
26. de Santillana, Crime, p. 96, fn. 22.
27. Pastor, History of the Popes, Vol. XXIX, p. 47.
28. Ibid. Vol. XXVII, p. 133.

CHAPTER 8

The Appearance of the Assayer and its Effects at the Roman College

The logistics of the move into print following the completion of The Assayer are interesting, illustrating a certain dependence in Galileo who willingly enrolls his friends as arbiters of style for his work, and disclosing also a rather marked divergence in the aims of Galileo and the aims of his 'Florentine group'. Galileo, naturally, was still concerned that his work should be received without visible offence and that he could, covertly, once more introduce the subject of Copernicanism. However, there were others who looked to his work for the glory it reflected on his group. Earlier Ciampoli had written to him, ¹ full of promise and wonder, and hoping for the immortality of Galileo's name coupled with the universal honour of Florence and of Tuscany. Amongst his circle this was always the prevalent view, whereas the validity of his conclusions were seldom mentioned.

Prince Cesi and Virginio Cesarini are the two on whom Galileo is heavily reliant in the matter of style of The Assayer. This, of course, had nothing to do with literary style but with the important question of exactly how much could be said without antagonising church authorities or the Jesuits. How far can Galileo push without being accused of flouting the Decree?

To Prince Federico Cesi, in October 166, Galileo wrote:

"I have finally despatched to Virginio the reply to Sarsi, and through him to you ... I submit the

outcome of this small thing entirely to
your judgment." 2

Judging from the letters sent to Galileo by Virginio Cesarini, Galileo had expressed the same sentiments to him. It was a task which Cesi and Cesarini took seriously. By the end of December Cesarini was able to send a copy of The Assayer to Prince Cesi:

"I am sending to you via Sig. Angelo de Filiis the original of The Assayer of Galileo, keeping with me a duplicate ... I pray that you will note those things which appear too pungent, and other particulars of doctrine of which you do not approve and to send them to him at once, so that we may get it printed as soon as possible, without being obstructed by the Jesuits who already know of it ... Msg. Ciampoli and I have noted some₃ things which we have adjusted or corrected ..."

In order to fulfill his own obligations in the matter of arbitration, Cesarini took full advantage of those Linceans residing in, or visiting, Rome. Writing to Galileo at the beginning of January 1623, Cesarini apologises for having, until now, merely acknowledged the safe arrival of The Assayer. Now on the 12th January 1623, he is ready to give his opinion on the work and apologises for his tardiness:

"This was because I intended waiting until the work could be read by all the Linceans who are in Rome, and then by Prince Cesi, so that the consensus of opinion could be given to you of that which they wished to be₄ moderated or softened or silenced ..."

To this end Cesarini had had several "fair copies" made for the Linceans' scrutiny, so by early January - and before publication - The Assayer was being discussed in Rome. The considered "opinion of the company" now being relayed to Galileo by Cesarini is that

they are full of praise for his work and "no-one ventured to point out" for alteration "any particle, either in the style or in the science".

"Certainly", writes Cesarini:

"we wish to publish the work, and we wish to do so in Rome, in spite of the power of the adversaries ... we have⁵ opposition but we will surely overcome."

Enough has been said of The Assayer by other writers, for me to dispense with a eulogy of its masterly style and a re-emphasis of its important place in the history of science. It is indeed a brilliant piece of writing, although possibly not in the sense usually attributed to it. In spite of his hopes that a freer intellectual climate had emerged he was still, at the time of writing, under the instruction of the 1616 Decree. What Galileo wanted to say had to be introduced by innuendo, allusion or any other permissible method which would prove efficient to his purpose. At this skill, Galileo had no equal.

For the purpose of this thesis the examination of The Assayer is limited to three areas. These are: what enlightenment did Galileo offer with regard to the authorship of Guiducci's Discourse on the Comets? We have seen that Guiducci's work contained elements of personal offence to Father Grassi; was this continued in The Assayer? Finally, in what manner was Galileo able to discuss a possible cause for the deviation of the comet from its straight track, a discussion which was forbidden, as The Astronomical and Philosophical Balance had emphasised.

Throughout The Assayer Galileo maintained that Guiducci was sole author of Discourse on the Comets, and that the views contained in it were Guiducci's own. The only concession that Galileo will allow is that he and Guiducci, in company with others, had discussed some of the views which were eventually to be expressed in Discourse on the Comets and that their views concurred.

I have suggested that one of the aspects of the 'Sarsi' paper which particularly worried Guiducci, was the suggestion that he was merely a "copyist" for Galileo, and that this lowered his intellectual standing. Galileo attempted to rectify 'Sarsi's' error in thinking that "the entire discourse on comets had been the work of my hand",

"an idea which could never occur to anyone
wherever Sig. Mario is known ..."⁶

Again emphasising the same point, Galileo says,

"... there was no call for Sarsi to embellish the truth by introducing my letters, nor should he assign to Sig. Mario such a small part in Discourse on the Comets (with which he had more to⁷do than I) as to pass him off as copyist."

Throughout The Assayer, Galileo consistently refers to Discourse on the Comets as "Sig. Guiducci's propositions", "the treatise on comets published by Sig. Mario Guiducci", "written by Sig. Mario", "Sig. Mario's essay" and very many other forms.

Galileo states his purpose in writing The Assayer,

"meanwhile let Sig. Mario accept my defense of his treatise in⁸return for the honour he has done me ..."

The truth of Guiducci as author becomes a little strained

by the remarkable manner in which Galileo shows complete concurrence with all of Mario's propositions and is able to extend the cogency of the philosophical and physical arguments. But it seems that Guiducci, at least, was happy to have his intellectual status restored to him.

The tenor of the arguments in The Assayer is very different from the offensive Discourse on the Comets. That the Jesuits are still the opponents and not merely the other side in the debate, is still evident, but the personal level of attack is missing.

Father Grassi had now become a "worthy opponent",

"... the multitude of my opponents (and especially of those as worthy as Father Grassi) could only cause me pleasure and not pain, inasmuch as there is more delight in victory over a valiant and numerous host than over few and feeble opponents." ⁹

"Worthy", but vanquished. Galileo never missed an opportunity to score, and it is worth recalling at this point that he was fully aware that Father Grassi wrote The Astronomical and Philosophical Balance.

There is a suggestion too, that Galileo thought that the position argued for in that paper was not of Grassi's choice.

"I am sure that the said Father would never have spoken or thought or willingly have seen Sarsi write such fantastic things, far removed in every respect from the doctrine taught in Father Grassi's college, as I hope I shall make clearly recognised." ¹⁰

There is a particular passage in The Assayer where Galileo seems to be pointing out, quite specifically, that there is an intellectual split in the Society of Jesus, resulting from his earlier work.

"Sarsi has, therefore, no reason for saying that I am guilty of contempt for the dignity of the Collegio Romano. Quite the contrary; for if Sarsi's voice does emanate from the Collegio, I have reason to suspect that my doctrine and my reputation have been in bad odor there not merely at present but all along, inasmuch as in this Balance none of my thoughts are approved. Nothing is to be read there except opposition, full of accusation and blame, and, if one may believe the rumours, there is in addition to what is written an open boast¹¹ of power to annihilate everything of mine."

This is an extremely challenging paragraph, with that part which I have underlined being deliberately provocative. Galileo, with his customary caution and gift with words, immediately softens the impact by continuing,

"But as I do not believe this, nor that any¹² of these ideas exist at the Collegio, ..."

This claim not to believe the rumours which he has just advertised, ensured that he could not be taken to task, publicly, by the Jesuits. It also indicates that he did not share the grave worries of friends like Stelluti, who feared that if he opposed Jesuit scholarship too much, in print, the Society would move against him.

The foregoing quoted paragraph seems to suggest that Galileo had completely rejected his earlier hopes of Jesuit support. Perhaps he finally understood that the conflict within the Society would not yield to reasoned, philosophical argument, based on sound observational method, and this was all that he had been able to offer in the years leading to the Decree.

With regard to the motion of the earth, Galileo was able to

introduce more discussion on that point, in spite of the strict veto in the Sarsi paper. Skilfully, he returned to the question not in order to continue debate on this forbidden topic, but ostensibly to point out that 'Sarsi' had misquoted Guiducci. By happy coincidence the misquotation concerned the argument based on the comet's alleged straight path and final northern declination.

'Sarsi', says Galileo, does not quote Sig. Mario's words faithfully.

"... for where the latter says that it is either necessary to abandon the straight motion attributed to the comet or else, retaining that, to add some other cause for its apparent deviation, Sarsi wilfully changes the words 'some other motion' in order to deduce, quite apart from any intention of mine, a motion of the earth, and to produce more fireworks and foolishness here." ¹³

(It is interesting to note that this is possibly the only instance where Galileo forgets to maintain the fiction that the views in Discourse on the Comets are Guiducci's. In this paragraph he wrote of "any intention of mine".)

Having successfully introduced the forbidden topic, in the guise of showing that Sarsi has substituted the word 'motion' for the word 'cause', Galileo then added some further pointers while still carefully avoiding an actual debate. If the Roman College was demanding belief, this Galileo accepted, but not without a last word.

"And in conclusion I may add that if the movement attributed to the earth (which I, as a pious and Catholic person, consider to be most false and vain) lends itself to yielding explanation for so many widely diverse appearances observed in the heavenly bodies,

then I should not be sure that so false a thing might not deceptively correspond with the appearance of the comet, ..." 14

With this very convoluted sentence, and judicious use of double negative, Galileo has once again reintroduced the idea of the motion of the earth, and that the comet's movement corresponded to this idea. His disclaimers that movement attributed to the earth is false and vain, and that an apparent correspondence between such vain suggestion and the observed track of the comet is deceptive, deceived no-one as to his true view. Once again colleagues and scholars read and understood that that which he denied as false, would have been his own explanation. Neither Church authorities, nor Jesuits, however could make any protest or demur, because he publicly declared that as a pious Catholic he considers the correspondence to be false.

It was apparent to the Roman College Jesuits, that only the Decree stopped Galileo from continuing to argue for the motion of the earth. Galileo was a "pious and Catholic person" who would say what he was expected to say on the heliocentric matter, but who also knew of "so many widely diverse appearances in the heavenly bodies" which could be explained by the "forbidden explanation".

The question to ask then, was how many new observations might he have made since the Decree in 1616. Discourse on the Comets had suggested that observations of the comet of 1618-19 could be fitted by Galileo, into the Copernican system. Galileo, however, had not been forthcoming on that issue. His views on the comet had been earnestly sought by many in 1619, but even the queries

from Guiducci had only resulted in hints that more might have been said had it been allowed.

There was no reason to suppose that even if Galileo had been in possession of added information from observations made in the intervening years, observations for which motion of the earth was a possible explanation, he would have made them public. In fact there was, in early 1623, evidence to show that on some matters he was still remarkably secretive; that even with The Assayer about to be published, some elements of his work would not be included. Notably there was still his continuing belief that the tides could be seen as a consequence of the motion of the earth, and that he was still engaged on this work was known, in spite of the avowed deference to the Decree displayed in The Assayer. This news was conveyed to Ciampoli in their private correspondence who refers to it when replying to Galileo on 7th January 1623.¹⁵

The term "private correspondence" must be made clear at this point. It is obvious when reading the letters that some can be seen as private, whereas others were obviously written in the company of a group. This is particularly noticeable in letters written by Ciampoli. On some occasions when writing to Galileo it is distinctly personal one-to-one correspondence. This is suggested by the direct comments, the intimate details, and above all by the style of affection. In Italian letters of the time display of affection and reverence were part of the social etiquette and were excessively effusive. When Ciampoli is writing to Galileo more personally the affection and esteem is much more taut and brief,

with the directness of close friends who can dispense with social form. This is in marked contrast with other letters, also from Ciampoli, where affection is gushing, where comments are included from several people, and the list of "hand-kissers" at the end all suggest a concerted effort.

In one of these more personal letters, then, we learn of Galileo's continuance of his tidal theme:

"To pass to more important things, I rejoice at the new and admirable inventions concerning the tides. I wait with anxiety to see the discourse perfected. That first draft appears to me a miracle of ingenuity ..."¹⁶

It is not clear what Ciampoli means by "first draft". In 1616 when Count Orsini had asked Galileo to submit the work most supportive of his theory of a moving earth, it had been the tidal work which Galileo put forward.¹⁷ At a later date he had again tried to introduce his tidal theory, this time to Archduke Leopold.¹⁸ Either of these may have been the "first draft" to which Ciampoli refers, or there may have been yet another new manuscript by late 1622; but whether from a written-up piece of work or from explanatory notes in a letter to Ciampoli, we know that Galileo was doing "new and admirable work concerning tides" and that he was not submitting this for scrutiny.

Until 1632, it had been Galileo's intention to name his work (now known as The Dialogue Concerning the Two Chief World Systems¹⁹ and published in 1632), Dialogue on the Tides. The change was made because he was not permitted to use his original title although, as he wrote to Diodati,²⁰ the question of the tides was "the

principal argument which I dealt with in the book".

Personal correspondence or not, Ciampoli did not keep the news to himself. Within days Cesarini knew of it and in the January 12th letter, already mentioned, he asks about the tidal work:

"I understand that you have augmented that discourse of the tides of the sea by many very curious speculations, I am bold in asking you to inform us of it ..."²¹

If Ciampoli knew that Galileo had produced new work on his tidal theory, and if Cesarini knew of it, then we can be sure that all interested parties in Rome also knew of it. In the small, inter-connected, society of Rome, it was almost impossible to keep a secret (a fact of which Galileo would be fully aware when he informed Ciampoli), news moved quickly. This was already proving to be the case with regard to the manuscript of The Assayer. Cesarini informed Galileo, again in the January 12th letter:

"Already the news of this defence has spread to Sarsi and to the Roman College ... they know it all. Not, however, that it has arrived in their hands, nor have they seen a copy. They are anxious to see it, and also they have boldly requested it of me, but I have denied it to them, because with great efficiency they would impede publication ..."²²

In Rome in January 1623 news centred on Galileo, and much of the gossip and furore can be gleaned from this same Cesarini letter, very long by the standards of the time.

The news that The Assayer was out was causing discomfort in some quarters, especially among those, including many Jesuits - who had long declared that in fact Galileo could not answer The Astronomical and Philosophical Balance.²³ Now it was answered

and, according to the Linceans, answered very well indeed. In addition to The Assayer it was known, by at least some Romans, that he had new work on the tides.

And, as though this was not enough to bring Galileo's name once more into prominence, Cesarini gave him a further piece of news, that Tomasso Campanella's Defence of Galileo had just arrived in Rome from Germany. This certainly renewed gossip, and in an unwelcome manner.

"Some rivals are using this occasion to renew the calumnies against you which at the time (of the Decree in 1616 is meant here) were refuted and subdued ..." 24

Campanella's work was explosively anti-Aristotelian and created much discussion and anger. Marin Mersenne for example strongly denied that there was any justification in the assertions by Campanella that the Catholic theologians adhered strictly to Aristotelian statements even though they might be against sensory observations. 25

It was a curious and mixed situation, uneasy for all parties. Galileo and Cesarini were acutely aware that the Campanella ingredient at this particular time was stirring up opposition and providing fuel for their antagonists. For the Jesuits too Campanella must surely have caused problems. For those who adhered to the Aristotelian view the Defence of Galileo would be a further reminder of the Florentine as agitator, and for men like Grassi and colleagues of similar persuasion to find themselves in even some small agreement with the dangerous-minded Campanella must have caused them acute discomfort.

So the view in Rome early in 1623 was that Galileo had completed The Assayer a long and detailed reply to The Astronomical and Philosophical Balance and had also completed, but withheld, much new work on his tidal theory.

On all sides there was awareness that it might be possible for the Decree to be, at the least, remitted to the extent that the Copernican theory could again be discussed. This was a new Papacy with a lighter more perceptive attitude to major problems. Decrees could be altered or rescinded and The Assayer as an open letter to Cesarini Chamberlain to Gregory XV might well be viewed as a deliberate move by Galileo towards such change. If he had new evidence this must surely be of value to his hopes.

It must, therefore, have seemed necessary to Grassi and colleagues to know whether Galileo had such new observations or theories, in order that they might maintain their intellectual dominance.

Could Galileo, or could he not, offer additional "diverse appearances"? Judged by his record of astronomical discoveries, the alleged cometary observations, by his repeated attempts to put forward his later work on the theory of the tides and above all from his hints in both Discourse on the Comets and The Assayer, Galileo might well have important new evidence.

The Assayer, still in its manuscript form, received much praise from the Lincean group and their friends and colleagues. Those letters which are still available show a wide diffusion of Galileo's new work, even at this early date. During February 1623 both Cesarini

and Giovanni Faber informed Galileo of foreign visitors and scholars from Poland and Germany who admired his work.

But from the letters we have, there is no evidence of more than superficial understanding of Galileo's main points. When Cesarini wrote to Galileo in February 1623:

"Your fame is great and draws people from far
distant countries to admire and revere you." 26

this was typical of the letters he received. There was adulation in plenty, but no helpful discussion or debate.

In contrast, the reception by the reactionary group in the Roman College was immediate, and quickly made known to Galileo by Virginio Cesarini:

"in the Roman College, the Fathers at the beginning of the studies this year have declared in their public introductory lectures the discoveries of new things in science to be abhorrent, and with long orations sought to persuade the scholars that outside of Aristotle one does not find any truth ..." 27

Campanella then, had clearly been more sure of the intellectual climate in Catholic theological circles than had Mersenne.

Nothing illustrates the split in Jesuit thinking at this time in the 17th century better than the account, previously quoted, from Cesarini's letter. Father Grassi's An Astronomical Disputation on the Three Comets of 1618 published in 1619, had decisively listed those non-Aristotelian propositions which were acceptable. These included, that the fixed stars were at an immense distance greater than previously believed; that the moon had a rough and pitted surface; that the sun too was blemished; and an acceptance of Galileo's observations of Venus and Mercury. All these propositions

however were included by Grassi without his referring to Galileo by name, although it had been Galileo who had made all the astronomical observations and their accuracy had been attested by Roman Jesuits.

Now in 1623 some factions within the Society, as indicated in the January letter from Cesarini to Galileo, did not find any of the non-Aristotelian propositions acceptable and this point was being emphasised in the teaching at the Roman College. As we shall see the repercussions from this early warning by Cesarini were to have tremendous effect on Galileo.

These then were the different streams of thinking in Rome in the early part of 1623 as the manuscript of The Assayer was widely read.

The licencing and printing was commenced and on May 27th Giovanni Ciampoli was able to send Galileo the first two leaves of the first printed section, to be shown to "those who through obstinacy or jealousy did not believe that it would obtain the licence." ²⁸

In the accompanying letter, May 27th, 1623, Ciampoli informed Galileo:

"Today, in a very long audience with the Pope, I spent more than half an hour presenting to him your distinguished quality." ²⁹

Pope Gregory had been very interested, and this interview may have been an initial move towards requesting some leniency from His Holiness with regard to the 1616 Decree. It was not in the manner of the times nor in keeping with the gravity of the request to deal with these matters abruptly. In the regular letters

from Ciampoli to Galileo, this was the first mention of discussion with the Pope of any matter concerning Galileo. In January and early February the Pope had been unwell and again throughout April, so that certainly May would have been the earliest suitable time for Ciampoli to introduce close personal matters, if this was his intention. By the end of June Gregory XV was again ill, this time very seriously, and on July 8th he died.

If this half hour discussion with Pope Gregory had indeed been the first move by Ciampoli towards some intercession for Galileo, it had come too late. The enlightened "Virtuosi Papacy" was over and The Assayer addressed to Virginio Cesarini, Chamberlain to Gregory XV, was still only in the early stages of printing.

On August 6th, 1623, surprisingly Maffeo Barberini,³⁰ only fifty-five years old, was elected to the Papacy. This was a source of pleasure and delight to the Florentine group, to the Linceans and to all those who had enjoyed the buoyant atmosphere of the Ludovisi Papacy.

The Linceans were quick to turn the new papacy to advantage. Francesco Stelluti informed Galileo in early September that the printing of The Assayer could be completed within eight days, and when he wrote again on September 9th the news was:

"... we have resolved ... to dedicate the book to the Pope in the name of the Academy."³¹

If Galileo, Cesarini and Ciampoli had indeed entertained hope that Gregory XV might in some way diminish the severity of the Copernican ban, then their hope must have seemed more certain of

success under their erstwhile colleague Maffeo Barberini. When Urban VIII showed such delight in The Assayer and made this widely known, it looked as though some parts of Galileo's work were finally receiving the seal of papal approval. And how would such approval affect the Society of Jesus?

For the reactionary group who had already re-emphasised Aristotelian principles in the Roman College this would be a distinct shock. Apparent papal approval would make the work acceptable to an ever increasing readership, and undermine their own declaration for maintaining the works of Aristotle.

For the more forward looking Jesuits it was obvious that Galileo's Copernican cause was still a lively issue, and one which now had the appearance of increasing political strength.

With the success of The Assayer mounting on all sides and in many countries during the following months, the section of Jesuits for whom Grassi had been spokesman knew it was now imperative to discover how much work, outside The Assayer Galileo could show. Could he substantiate the implicit claims of his writings? This information was necessary and quickly.

Who better to draw out Galileo, once again, than Mario Guiducci?

CHAPTER 8 - References

1. Ed. Naz. Vol. 13. Ciampoli to Galileo, 17th July 1620.
2. Ed. Naz. Vol. 13. Galileo to Federico Cesi, 19th October 1622.
3. Ed. Naz. Vol. 13. Cesarini to Federico Cesi, 22nd December 1622.
4. Ed. Naz. Vol. 13. Cesarini to Galileo, 12th January 1623.
5. Ed. Naz. Vol. 13, Cesarini to Galileo, 12th January 1623.
6. Comet Controversy, Assayer, p. 169.
7. Ibid. Assayer, p. 176.
8. Ibid. Assayer, p. 177.
9. Ibid. Assayer, p. 177.
10. Ibid. Assayer, p. 176.
11. Ibid. Assayer, p. 179.
12. Ibid. Assayer, p. 180.
13. Ibid. Assayer, p. 262.
14. Ibid. Assayer, p. 269.
15. Ed. Naz. Vol. 13. Ciampoli to Galileo, 7th January 1623.
16. Ed. Naz. Vol. 13. Ciampoli to Galileo, 7th January 1623.
17. Ed. Naz. Vol. 12. Galileo to Archduke Leopold of Austria, 23rd May 1618. In this letter Galileo enclosed his work on sunspots and a "small discourse on the causes of the ebb and flow of the tides", and tells how he produced it a little over two years earlier (February 1616) at the request of Cardinal Orsini at the time that the theologians were considering the Copernican hypothesis.
18. Same letter.

19. Galileo Galilei, Dialogue Concerning the two Chief World Systems.
Translated by Stillman Drake, University of California Press:
Berkeley and Los Angeles, 1970.
20. Ed. Naz. Vol. 14. Galileo to Diodati, 16th August 1631.
21. Ed. Naz. Vol. 13. Cesarini to Galileo, 12th January 1623.
22. Ed. Naz. Vol. 13. Cesarini to Galileo, 12th January 1623.
23. Ed. Naz. Vol. 13. Stelluti to Galileo, 16th August 1622.
24. Ed. Naz. Vol. 13. Cesarini to Galileo, 12th January 1623.
25. T. Campanella, The Defense of Galileo. Studies in History
Vol. XXII No. 3-4, pp. xl to xli.
26. Ed. Naz. Vol. 13. Cesarini to Galileo, 25th February 1623.
27. Ed. Naz. Vol. 13. Cesarini to Galileo, 12th January 1623.
28. Ed. Naz. Vol. 13. Ciampoli to Galileo, 27th May 1623.
29. Ed. Naz. Vol. 13. Ciampoli to Galileo, 27th May 1623.
30. There was no way in which it could have been foreseen that
Cardinal Barberini would have gained the Papacy. P. Aubanel
discusses the unexpected manner of his election Pierre Aubanel,
Le Génie sous la Tiare, Artheme Fayard et Cie, Paris, 1929.
31. Ed. Naz. Vol. 13. Stelluti to Galileo, 8th September 1623.

CHAPTER 9Jesuit Overtures

In 1619 Mario Guiducci had taken offence at Grassi's remarks in The Astronomical and Philosophical Balance, as detailed in Chapter 7, causing a breach which as we shall see, still continued in 1624 and which, until then, had not appeared to be of great concern to Father Grassi or the Roman College. Certainly Mario makes no mention during these years of any attempt at reconciliation. However, if Guiducci was to be tempted into discussing the recent tidal work, or any other further discoveries Galileo might have made and relaying the information to the Roman College, some effort now had to be made to reconcile Guiducci and Father Grassi. In spite of Grassi's senior rank, both ecclesiastically and academically, the move had to be on his part and writing to Galileo in September 1624, Mario tells how Grassi solicited the help of Father Tarquinio Galluzzi to act as go-between and indicate to Guiducci that he would like to meet him to have a private conversation.¹

Initially Guiducci had refused, saying that he had not intended an argument and now had no reason to seek the friendship of Grassi. But Grassi had reason enough and consequently greater pressure would be brought upon Mario.²

The great success of The Assayer with its implicit claims for further evidence in support of the Copernican issue, would in itself have necessitated covert investigation by Father Grassi. There were, in addition, other factors enforcing a closer scrutiny of

Galileo's work and thought, particularly any work not yet written.

One of these factors was Galileo's reply to the Ingoli pamphlet, a major task which occupied his time from June 1624 to April 1625. In 1616 Ingoli had prepared for Galileo,³ a pamphlet listing all the objections being made against the Copernican system. (We recall that in 1622 Ingoli had become Secretary to the Congregation newly formed by Gregory XV).

This reply to Ingoli, refuting the Copernican objections, was not published but was certainly circulated in Rome. As early as the middle of June 1624 the correspondence shows that the commencement of the reply was already known to Guiducci,⁴ and by July we gather that it was also known to Cesare Marsili,⁵ Tomasso Rinuccini,⁶ Benedetto Castelli, Filippo Magalotti and Piccolomini,⁷ and it is fairly certain that Cardinal Barberini⁸ also knew. It seemed as though Galileo had gained greater confidence from the reception of The Assayer. During the many months it had taken Galileo to write it, he had been urged in a succession of letters from many friends, but chiefly from Ciampoli, Cesarini and Prince Cesi, to hurry the work along, and he had sought their approval and arbitration in the work as it progressed.

Whilst it is true that the Ingoli reply was not intended for publication it was, nevertheless, sure of a wide circulation, but for this work Galileo needed no urging nor did he submit it to any of his friends for editing. Such confidence must have given greater impetus to the Jesuits' desire to learn for themselves exactly what he might have discovered.

There may too, have been a further factor to arouse their interest, one connected with the case of de Dominis. He has already been mentioned as the renegade Archbishop of Spalato who had become a member of the English Church, and who during the papacy of Gregory XV had been allowed to abjure and return to Rome, a free man. However, Urban VIII, the Pope who followed Gregory, had doubts of the sincerity of this abjuration and de Dominis was imprisoned in Castel S. Angelo, where he died in September 1624,⁹ the cause of his death being not clear to us. His body and his writings were burned in Campo dei Fiori¹⁰ following post mortem sentence.¹¹

There is no evidence that any connection between Galileo and de Dominis was suspected, but it is certain that they were both working on the question of the tides. The thoroughness with which Cardinal Bellarmine, in 1611, had asked the Congregation to check whether any mention was made of Galileo in the proceedings against Cesare Cremonini, following the most slender connection, shows the precision used by the Society in these matters. We have every reason to suppose they would be as precise in 1624, in checking the slightest possible link between Galileo and de Dominis.

It had become a matter of some urgency then, for the Society, that Father Grassi and Guiducci should regain amicable relations. Efforts were redoubled and in August 1624, Tomasso Rinuccini was able to write to Galileo, from Rome, with the information that:

"the peace is made ..."¹²

In September, Guiducci wrote a detailed letter to Galileo, who was interested to learn the outcome of the eventual interview

with Grassi, and what had made Guiducci finally yield. According to the letter, Grassi had made several overtures to Mario, all of which were rejected, and Father Tarquinio had made more than one attempt to reconcile the two. In addition, "a very principal prelate" had "many times and with much energy sought after me himself". To no avail, until finally when Guiducci had been ill in bed with a fever:

"there came to visit me more Jesuit fathers to whom I was extremely obliged and I decided not to deny him any more; and so without wasting time the following day the consent was given and I was visited by the aforesaid Father Grassi ..." ¹³

I have suggested that the reason for this reconciliation was a wish by the Jesuits to know more of Galileo's recent work, and this seems to be supported by Guiducci's account of his first meeting with Grassi after the friendship was renewed.

Father Grassi had greeted Guiducci with much courtesy and affability, as though meeting after a long time" (as indeed they were) but with no recriminations for the past quarrel and offence.

"... the greater part of our discussion was in praise of your writings." ¹⁴

This letter from Guiducci to Galileo supports the view that Father Grassi wanted most particularly to know about Galileo's new work, on tides. We can judge his keenness for information from the direct way in which he broached the topic.

Guiducci records that after the initial greetings, Father Grassi introduced the subject of tides by discussing the recent work of de Dominis on the ebb and flow of tides, ¹⁵ which he had reviewed

but could not approve, and then moved straight in to discuss Galileo's work:

"We have the writings of Signor Galileo on the same subject, which are very ingenious," 16

Ingenious too was Father Grassi's method, because Guiducci was only too pleased to talk of Galileo and his work:

"To which I replied that your thought to demonstrate the motion of the earth with the reciprocations of ebb and flow of tides, and the variety of times in which they make the motions, was truly to be commended ..." 17

It is useful at this point to stress the surprising import of this letter. Under the guise of Sarsi, Father Grassi in The Astronomical and Philosophical Balance had stressed the statement issued in the Decree of 1616: that the earth is not moved. 18 Earlier in the same paper Father Grassi had warned that anything about the motion of the earth had better be whispered with lowered voice. 19

Galileo had regarded the severity of each warning to the extent that his reply had been delayed for nearly three years, and when it finally appeared his reference to the motion of the earth had been guarded in the extreme and surrounded by protestations of his piety. 20

Now on resumption of friendship Guiducci feels safe to tell Father Grassi of Galileo's wish to demonstrate the forbidden motion, by his work on tides. This would seem to support Galileo's suggestion that the view argued by Father Grassi in The Astronomical and Philosophical Balance was not his own choice. 21

Guiducci's conversation with Father Grassi continued in similar vein. Mario was evidently not in a position to give Grassi any details, but he certainly reinforced the belief that there was extra work not yet written up. He went on to point out that the earlier discourse on tides had been imperfect but that now Galileo intended to perfect it, by the addition of new evidence or by relating "other effects":

"which in the first you had remained silent about." 22

The meeting continued with a discussion of the motion of the earth, which Guiducci was quick to point out Galileo had discussed "ex hypothesi",

"and not as though you took it as a starting point established as true ..." 23

And it was at this stage that Grassi made a most significant proposal surely designed to elicit full information from Galileo via Guiducci, although it may well have been a genuine offer:

"it may be, the Father said, that when you should discover a demonstration of that motion, that he might agree to interpret the Sacred Scriptures in other ways than is done in the places where it speaks of the stability of the earth and the motion of the heaven, and this is as per Cardinal Bellarmine; to which opinion I totally gave my assent. And then, and with ceremony, we left our first meeting." 24

Within a few days Father Grassi again visited Guiducci, when among other topics Galileo's treatise on motion and the Medicean planets was discussed, but as Mario was still ill it was only a short visit.

"I shall return the visit to him, and if anything new turns up to advise you of, I will send it." 25

Guiducci was happy to have "gained his good standing". From a further letter of Guiducci to Galileo, later in September of 1624, the "standing" was very good indeed and there were several visits between Grassi and Mario, all conducted with great cordiality. We can see from the correspondence that the renewed friendship pleased Guiducci enormously, both personally by being the object of so much attention from a leading member of the Society to which he had always felt so affectionate, and also on behalf of Galileo and the apparent interest being taken in his work. Without doubt, this latter point was of prime importance to Guiducci.

"The said Father", he wrote to Galileo,

"makes much ceremony to me when I go there ... if he is with some other person he leaves their company in order to come to meet me, and then he neither leaves me nor neglects me, accompanying me right outside the door ... It would be a wonderful thing if this man might apply his mind to the opinion of the movement of the Earth, and accept it and remain connected to us ... I am not beyond hope of it, seeing that he seems to have a great desire to understand it, and I believe that he may have acquired enough knowledge from The Assayer." 26

Guiducci, like many of the Galilean group, was overwhelmed by the rhetorical power of The Assayer, reading into it proofs of the motion of the earth which it simply did not have. The important knowledge which Father Grassi had acquired from its perusal was that Galileo had further work giving details of natural phenomena which might yield evidence of the Earth's motion.

But was Galileo interested in these overtures initiated by Father Grassi and conveyed ingenuously by Mario Guiducci?

In a letter to Prince Cesi in September 1624, he was careful to pass on the information:

"The Father Grassi has become extremely friendly to Sig. Mario Guiducci, he writes me that that Father 'does not abhor the motion of the earth', the said Mario having removed his major scruples and that he seems to incline much to my opinions, so would it not be marvellous if one day he might be all mine ..." 27

Here Galileo is almost quoting to Prince Cesi Guiducci's own words, with neither excitement nor interest, but dutifully recording that Guiducci has indeed passed on the salient points of Grassi's conversation. For Galileo, wariness of the Jesuits was very strong and he understood perfectly the double standard under which Father Grassi had to operate.

To Guiducci it appeared that following The Assayer real progress was being made in bringing the Jesuit astronomer's interest and understanding to bear on the Copernican problem. This is very apparent in the regular letters he wrote to Galileo, keeping him acquainted with the situation. From August until November, Guiducci rejoiced that Grassi and Galileo, with himself as intermediary, were moving closer together in this important debate. It came as an unpleasant shock to Mario to learn that Father Grassi intended making public reply to The Assayer, reinforcing the opinions stated in The Astronomical and Philosophical Balance.

At the end of November, Guiducci wrote to Galileo of the pending

publication and of the conversation with Father Grassi.

"The other day I went to the Roman College to visit a Father friend of mine, Father Grassi came across me and after many ceremonies and apologies, he asked me if I was willing to be named in the reply which he wanted to publish shortly." 28

Having only recently recovered from the breach caused by the 'Sarsi' paper, Guiducci realised he was being drawn into a similar situation. Suspicion that he was being 'used' occurred to him. He wanted no repetition of the slurs on his scholarship which he had felt were made in The Astronomical and Philosophical Balance, nor was he able to refuse outright the request from a senior member of the Roman College.

"I replied to him that he might do whatever pleased him, that as for me I was indifferent one way or the other, and that I did not wish to give my consent nor dissent." 29

Mario Guiducci was in a quandary, unsure of how to answer in this unexpected situation, and his letter continues:

"He (Grassi) then made a gesture of excuse, that he was forced to write and that he knew it was bad of him." 30

Guiducci's letter to Galileo, of November 30th 1624, disclosing this information is long and bitter, and from it we learn a great deal about the relationship of these three men.

The letters from Mario to Galileo form one of the most comprehensive sets of Galilean correspondence we have. They cover the period so far reviewed, and continued until Galileo's death. Guiducci spent much time with Galileo and much time at the Roman College. During his many regular visits to Rome he wrote to Galileo almost

weekly. He seems often to have had in his possession letters from Galileo giving details of the latest work, and these he discussed with those many scholars and literati interested in such topics.

He mixed freely with the students and professors of the Roman College, never losing that feeling of 'one-ness' with them. He was also welcome in the Papal household, being quite friendly with Cardinal Barberini, nephew of Pope Urban VII. It was a friendship which apparently stemmed from that between Cardinal Barberini and Galileo, as Guiducci carried greetings to the Cardinal from Galileo on several occasions,³¹ but it is clear from Mario's letters that he and the Pope's nephew formed bonds of interest themselves.³²

Ciampoli and Prince Cesi held him in high regard. He became a member of the Linceans in 1625.³³ He was a scholar and man of letters in his own right, and yet for so many years he was content to serve Galileo. It is quite evident, from their many letters, that, increasingly over the years, Galileo discussed philosophical and mathematical problems with Mario in close detail, so that towards the end of Galileo's life members of the Galilean fraternity attached nearly as much importance to Guiducci's views as to those of Galileo. Yet in quite menial matters too, Guiducci served Galileo, attending - with apparent pleasure - to problems of household management and business affairs.

The bitter letter of November 1624 shows that Guiducci had, in fact, a large share of that 'ingenuousness' and 'trust' to which Sarsi had referred in The Astronomical and Philosophical Balance. Mario had believed that the two most influential factors in his

life, the Society of Jesus and Galileo, were at last bridging their differences, through his offices.

"Truly, to me this reply is a new thing. Having with many means attempted to be my friend, I convinced myself that with the new friendship he had settled in agreement and with a permanent silence on past things. Now, being deceived, I feel resentful ..."³⁴

Guiducci had then attempted to dissuade Grassi from his proposed course of action. He had not wished to ask the Father the nature of the "force" upon him to make the proposed reply, but had presumed Grassi did not want to appear to have been the loser in the widely publicised comet debate.

In addition to Galileo's The Assayer, another work had been published refuting the Tychonic views of 'Sarsi'. Entitled Antitycho,³⁵ this was the work of Scipione Chiaramonti, a man in his late fifties, Professor of Mathematics in the University of Perugia, and one who had done much controversial writing, arguing against Tycho, Kepler and Galileo.

Guiducci now asked the Jesuit if he had seen Antitycho, saying that if Father Grassi replied to Galileo in order to appear not to be convinced by his views, then he would also have to reply to Chiaramonti.

We get some insight here into the nature of Galileo's dedication to his own vision. Apparently he had not agreed with Chiaramonti's particular refutations of some of Sarsi's points, and in writing to Guiducci had offered a defence of Sarsi. Although Chiaramonti wrote against the work of Tycho Brahe his arguments were unacceptable

to Galileo. And Galileo could afford to be magnanimous in the light of the success of The Assayer and Papal approval. No doubt also, he was aware that Father Grassi would soon learn of his magnanimity, from Guiducci:

"I happened to have in my pocket your letter in which you defended Sarsi from the oppositions or more impudent replies given by Chiaramonti to that third argument. I read that which pertained to him. He approved all the discourse and praised greatly the facility that you have in expounding clearly his thought." 36

Father Grassi had also noted that Galileo's letter to Guiducci was very long and made comment on this. Guiducci was very distressed about the possibility of yet another publication from Grassi and tried a further tactic of dissuasion:

"To that I replied that at present you are in the writing vein so that he might consider that and worry that you yourself would reply to him very shortly." 37

It may well be that the force of which Father Grassi spoke to Guiducci, was simply that of being instructed by his Order to continue his role in the comet dispute. Certainly the Society had been put into the defensive position by The Assayer, and if, as I have suggested, Grassi's first paper in this dispute, on the three comets of 1618, had been intended to move opinion towards the Tychonic system with the 'Sarsi' paper stressing that there was no other acceptable view, then Galileo had abruptly destroyed their intentions.

The subject on which the Society had wanted to have the final definitive word was still open, and Father Grassi's projected reply to The Assayer may have been required of him. If we accept this, and accept also that what Guiducci writes to Galileo, concerning

Father Grassi:

"that when he (Galileo) should discover a demonstration of that motion, that he might agree to interpret the Sacred Scriptures in other ways ..." 38

was a genuine statement of intention by Grassi, and made as the result of a dawning belief in the possibility that some new discovery might be forthcoming, then we can see that the eminent Father of the Roman College was in an unfortunate position.

The letter of November 1624 from Guiducci to Galileo, where Father Grassi's intended reply is mentioned is a very emotional one. It is full of the scheme Guiducci has formed whereby he intends to refuse to pass any comment on Grassi's new work although he fully expects to be invited to do so, but will work on an answer himself to have ready when Grassi's work appears. In this answer he clearly expects Galileo's help.

In view of his own problems and worries, Guiducci does not relay as much information about Grassi's state of mind as we would wish, but there is one paragraph where it seems clear that Grassi is not too happy about further confrontation with Galileo:

"he (Grassi) then said that he had not wanted to touch on new questions of any sort, as you had attempted to draw out; and concluded that he greatly desired your favour and asked me to be the intermediary to which I replied that you thought him to be of eminent ability and independent, and that he was able to perceive from the defence that I had shown to him that you had good wishes towards him." 39

(The reference here to defence is defence of Sarsi against Chiaramonti offered by Galileo).

In Guiducci's next letter to Galileo, in December 1624, we learn that Galileo was pleased to hear that Grassi is to reply yet again in the debate, and that it appears he, Galileo, will take up the challenge. Guiducci had evidently been dissuaded by Galileo from taking any part, but the friendship with Grassi is over.

"Never again will I attempt to maintain the commenced friendship with said Sarsi." 40

CHAPTER 9 - References

1. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th September 1624.
2. Same letter.
3. Pastor, History of the Popes from the close of the Middle Ages, Kegan Paul, Trench, Trubner and Co. Ltd.: London 1941, Vol. XXIX, p. 49, and Ed. Naz. Vol. 13. Galileo to Cesi, 8th August 1624.
4. Ed. Naz. Vol. 13. Guiducci to Galileo, 21st June 1624.
5. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th July 1624, in which Guiducci reports Marsili speaking of the work.
6. Ed. Naz. Vol. 13. Rinuccini to Galileo, 20th July 1624.
7. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th July 1624. In this letter Guiducci sends the regards of Piccolomini, Magalotti and Castelli to Galileo. One cannot doubt that Mario will have passed on the news of the reply to Ingoli to these friends of Galileo.
8. That Cardinal Barberini also knew in early July seems very probable. On June 21st Guiducci wrote to Galileo (Ed. Naz. Vol. 13, 21st June 1624) in which letter Mario related that he had not been able to see Cardinal Barberini that morning, but would do so later. It is certain that Guiducci would see the Cardinal and highly probable that he would pass on the news that Galileo had started on the Ingoli reply.
9. Ed. Naz. Vol. 20, p. 433.
10. Ibid, p. 433.

11. Ed. Naz. Vol. 13. Faber to Galileo, 14th September 1624.
In this letter Faber recounts how he was called to Castel S. Angelo in the early hours of the morning to witness the post-mortem examination of de Dominis' body. "I believe this was so the world could not say he had been poisoned", he wrote, and continued "we found all the innards clear, no suspicion of poison, only the lungs were somewhat inflamed". Faber also said that Cardinal Scaglia had found that de Dominis had lapsed, but before dying had repented of his errors, had confessed and had had all the sacraments of Holy Church.
12. Ed. Naz. Vol. 13. Rinuccini to Galileo, 10th August 1624.
13. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th September 1624.
14. Ibid.
15. This was Euripus, seu de fluxu et reflexu maris sententia by Marci Antonii de Dominis - Rome 1624.
16. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th September 1624.
17. Ibid.
18. Comet Controversy, Astronomical Balance, p. 98.
19. Ibid., p. 98.
20. Comet Controversy, Assayer, p. 269.
21. Ibid, p. 176.
22. Ed. Naz. Vol. 13. Guiducci to Galileo, 6th September 1624.
23. Ibid.
24. Ibid.
25. Ibid.
26. Ed. Naz. Vol. 13. Guiducci to Galileo, 30th November 1624.
27. Ibid. Galileo to Cesi, 23rd September 1624.

28. Ibid. Guiducci to Galileo, 30th November 1624.
29. Ibid.
30. Ibid.
31. Ed. Naz. Vol. 13. Guiducci to Galileo, 18th December 1623; 21st June 1624; and 15th October 1624.
32. Ed. Naz. Vol. 13. Guiducci to Galileo, 15th October 1624, in which Mario recounts a long conversation with Cardinal Barberini concerning designs for the Pope's coach.
33. Ed. Naz. Vol. 13. Faber to Galileo, 1st May 1621. As early as 1621 Guiducci was nominated for membership along with several others.
Ed. Naz. Vol. 13. Galileo to Faber, 12th May 1621, Galileo approved the list of nominations.
Ed. Naz. Vol. 13. Cesi to Galileo, 27th December 1624.
Guiducci's nomination had finally come up.
Ed. Naz. Vol. 13. Guiducci to Galileo, 18th April, 1625.
Guiducci was now a member of the Linceans and he thanked Galileo for his part in this.
34. Ed. Naz. Vol. 13. Guiducci to Galileo, 30th November 1624.
35. Scipione Chiaramonti, Antitycho, ecc. Venetis, MDCXXI, Evangelistum Deuchinum.
36. Ed. Naz. Vol. 13. Guiducci to Galileo, 30th November 1624.
37. Ibid.
38. Ibid. Guiducci to Galileo, 6th September 1624.
39. Ibid. Guiducci to Galileo, 30th November 1624.
40. Ibid. Guiducci to Galileo, 21st December 1624.

CHAPTER 10

The Spinola Lectures

In 1624 Galileo's confidence had risen higher and higher. The Assayer was well received, he had Papal approval and applause from all points of Europe. He was working diligently and apparently happily on his revision of the earlier tidal paper, on his projected Dialogues, on a commentary to Chiaramonti's Antitycho towards which he was unfavourable, and on the Ingoli reply. Judging from the correspondence, the Ingoli reply was the most important, at this stage, to Galileo.

Galileo intended full circulation of the Ingoli reply to follow the publication of Chiaramonti's Antitycho, but by November of 1624 a limited yet well directed readership was being maintained and organised by Ciampoli. As always, Guiducci supplied the details to Galileo:

"Already Monsr. Ciampoli has conferred with some friends, and in particular with a Scottish gentleman who serves Cardinal Barberini, Sgr. Giorgio Conneo ... This gentleman in the ante-room ... (Cardinal Barberini's meeting chamber) the other morning talked of it, praising it extremely; but blaming Ingoli ..." ¹

Details of the Ingoli reply had gone even further than the ante-room, Ciampoli having spoken of it to the Pope, his intention being to make Urban aware that Ingoli had written on matters which he did not properly understand. With his customary caution, Ciampoli had ensured that in the event of complaint or resentment from Ingoli the Pope had "the necessary information". At this point, 22nd

November, 1624, Ingoli had not yet seen the manuscript, Guiducci and Ciampoli judiciously ignoring his requests.

With this reply to Ingoli, Galileo was intending to move back again into the Copernican debate, no longer restraining himself to the hints of The Assayer. It is not at all certain how much information Ciampoli gave to the Pope, but in any discussion of the Copernican issue Urban VIII was well aware which side Galileo would take and he apparently made no demur that the subject was being re-opened. And there is some reason to believe that Barberini might have seen a new aspect to the restricting effects of the Decree of 1616, one pointed out to him earlier in 1624 by Cardinal Eitel von Hohenzollern of the Congregation. Hohenzollern had said that by declaring the Copernican doctrine to be heretical there was risk of discouraging Protestants who had thought of converting to Catholicism, as many of them were Copernicans. Urban had said that The Holy Church had not and would not condemn the doctrine as heretical but only as temerious.² In autumn of 1624 the Pope may well have welcomed, quietly, Galileo's views on Ingoli; he too may have felt the need to know any and all new work of Galileo.

At this stage, Galileo's confidence was apparently well-founded. Through Ciampoli he knew that his standing with the papacy was excellent, and through Mario he was kept abreast of a great deal of Jesuit thought.

If the Society had used Guiducci to keep them informed of Galileo's affairs it was a system that worked two ways: through December 1624 and the months of 1625 Galileo knew of every movement

and setback in Father Grassi's attempts to answer The Assayer.

He knew too of an event at the Roman College in the autumn of 1624. This should have indicated to him the growing strength and determination of a reactionary section of the Society, a section intent on stamping out the recent move to a more liberal thought, by some of its members.

At the end of September 1624, Guiducci had informed Galileo of a forthcoming lecture at the Roman College, where he evidently expected to meet Father Grassi again. If, on this occasion, wrote Guiducci, Father Grassi should continue the great affability and recommenced friendship:

"I will tell him, in confidence, that I am awaiting your reply to Ingoli, and will promise to show it to him when I have it." ³

(In the event he was never to show it to Father Grassi, as it was not in Guiducci's possession until that day in November when he was informed by Grassi of the projected follow up to The Assayer. In his extreme annoyance at what he regarded as Grassi's duplicity, Guiducci deliberately withheld Galileo's Ingoli reply.)⁴

In October Guiducci wrote to Galileo, saying that he had attended the lecture at the Roman College, which had been directed against "the supporters of new beliefs", and particularly against those who did not follow Aristotle. Mario had been promised a copy (we do not know by whom) which he would circulate to Galileo and other friends in order that they might refute each argument.⁵

This lecture, early in October, was apparently a forerunner of a series of such lectures, for in the first two or three days

of November Guiducci records that another lecture was made in the Roman College:

"... more of an invective, very vehement and violent against the supporters of new₆ opinions and opponents of the peripatetics."

Again, Guiducci was to send a copy of this lecture to Galileo so that he might see the fallacies used in the Roman College discourses, and for comment.

The copy was duly forwarded to Galileo on December 27th, 1624, by Guiducci, who also said he was preparing a little censure on this subject, which would be sent on later for Galileo's correction, and augmenting. It is clear that the lectures, when given, had received much applause, and it is equally clear that Mario was not present at all of them as he was evidently disappointed at the calibre of the material in the copy which he sent to Galileo:

"having been lauded to me in such manner that I anticipated seeing something other than that which is now issued to me." ⁷

and

"As you will see, it was not difficult to censure because it is full₈ of contradictions and fallacies and errors."

During January we learn that Galileo had agreed with Guiducci's assessment of the quality of these Roman College discourses, and that he had found "new foolishness" in the notes.

What seems to have been happening at the Roman College during the last three months of 1624 is that a set of lectures was given to the new students, in order that from the beginning of their course they should be fully aware that there were in circulation opposing philosophies and conflicting modes of thought. More importantly

they were being instructed that to follow Aristotle and "the ancients" was the only right and certain way. The lecturer on these occasions being Father Fabio Spinola, professor of philosophy and of sacred scripture, a man of eloquence and rhetoric.

The copies and notes of the Spinola lectures which passed between Galileo and Guiducci have been lost, but Favaro has found a document which appears to be a copy of a completed manuscript by either Guiducci or Galileo, and probably containing the ideas of both. In this the Spinola material has been broken down into 80 subsections and their comments or "censures" are inserted, giving a dialogue effect.

There is no doubt that the content of the Spinola material well deserved the criticisms of Galileo and Guiducci, but they were equally foolish not to see the threat offered by these new lectures. Father Spinola was no old "die-hard", or at least not in years. In 1611, as a young man of 18, he had entered the Society of Jesus at the time when Galileo's reputation was at its height in the Roman College, and when many of the younger members were being excited and moved by the new philosophy and new discoveries.

Spinola had evidently come through this period with his Aristotelian philosophy soundly entrenched. If some of the Society's astronomers and mathematicians were beginning to usurp philosophy's traditional role of showing the truth it would be spelled out, very carefully, to the class of 1624 which method they were to accept as the right one.

The import of the lectures had been discussed in late August

and September in Rome prior to their public airing, almost simultaneously with a similar incident in Paris where de Claves, Villon and Bitault were excluded from the Sorbonne for discussing and defending anti-Aristotelian propositions, and simultaneously also with the 'force' newly impressed on Grassi to refute Galileo's The Assayer.

However, Spinola's stated intention, in beginning this course for the new students, was to give them rules of philosophising. These rules were not completely new, but would help them see what importance and validity were to be given to the old philosophers.

Spinola told them that in trying to diagnose "the fallaciousness of reason", to "distinguish the ambiguity of arguments", or to "distinguish doubt from certitude" there were four rules which would direct all judgments. These were the clear light of divine faith, constant experience, clear and perspicuous reason, and the agreement or common opinion of other wise men.⁹

Spinola stressed that of these rules, faith had the prime position, it being established by the authority of God and quite obnoxious to falsity.

"A philosophy that is worthy of a Christian man has to be in harmony with theology and the principles of faith. Truth is one and simple, and a philosopher should not reject that except which faith does not approve, and he should only embrace that which is consonant with faith." 10

However, in the absence of help from the divine word (presumably in those areas of thought not touched on in the Bible) then the second rule of constant experience may be applied. And again "where

there is no experience", then reason (not "blind or futile reason" but "efficacious reason") will suggest something, and the philosopher will go along with reason on the matter.

In the problem cases of dispute where both sides might be based on probable testimony or "guesswork" then they were to use authority and general concensus, with a view to rejecting new opinions and fixing on the one which seemed to be most in concordance with the testimony of ancient writers.

Spinola continually reiterated the important function in new philosophy, of earlier work. Conformity with the ancient authorities had to be a guiding principle.

This last emphasis must surely have been made with Galileo, at least partly, in mind. In 1624 using the convoluted method of argument of which we know Galileo to be capable he may have been able to make the case that he did indeed follow the rules of divine faith, constant experience, and clear and perspicuous reason. But on the question of remaining true to the agreement or common opinion of wise men Galileo most clearly worked in his own way, promoting new ideas and discoveries.

And for very many scholars, as the correspondence shows, "the novelties and new inventions" which Spinola urged the students to reject were the exciting and compelling part of the Galilean debate.

In order to establish the origins and long establishment of this fourth rule, that of conformity with and consensus of ancient philosophers, Spinola quoted strings of examples both from "gentile philosophers" and early Church Fathers, as well as from classical

and literary sources. Spinola glossed over the many contradictions between earlier philosophers and scholars.

In brief, what emerges from the Spinola lecture, are very clear guide-lines for future Jesuit thought. Those who do not use either the best authors nor antiquity itself are mistaken. The supremacy of Aristotle "whom we venerate as a master" was reaffirmed, and although it was acknowledged that in physics he occasionally departed from the view of the ancients and aired new opinions in his books, he had attended to commonsense in his arguments. (Again, this may have been intended for Galileo, much of whose work certainly defied the commonsense of the times). Each discipline had its own rules, as had philosophy, and could not be used outside the set limits.

There was also a statement which must surely have been intended for Father Grassi, and many of those around him who had possibly entertained the notion of reinterpreting the Sacred Scriptures. According to Father Spinola, one could not interpret sacred writings contrary to the opinions of the Fathers, dissension encouraged falsity and concordance implies truth.

The authorship of the annotations on the Spinola manuscript is slightly doubtful. Favaro shows that the manuscript is no longer in the handwriting of either Galileo or Guiducci, but of some late 17th or early 18th century scholar who copied it from the original. Authenticity is attributed to the document as it was found in the Galileo file, and the copier noted in the heading that it had been in Galileo's handwriting. However on reading the annotations it is almost certain that the majority are by Guiducci.¹¹

They have a similarity in style to the rushing, excitable passages of Mario's letter to Father Tarquinio, and of the letter of November 1624, when Mario informed Galileo that Father Grassi intended replying to The Assayer.

In addition, one or two of the comments are addressed to Galileo, one by name, and others clearly denote Guiducci's authorship by the manner in which they pick up matters which the two of them have mentioned in letters

Through these comments by Guiducci, on the Spinola lectures, we are in a position to understand the abruptness with which the reactionary faction within the Society of Jesus re-established the primacy of the traditional Aristotelian philosophy, during the last three months of 1624. Coupled with this, (and certainly the death-knell to the attempts of the enlightened group at the Roman College who may have hoped to move forward into a new method of philosophising on natural phenomena), was the rejection of "innovation". If the standard now being set by Spinola was followed rigidly, then there would be, necessarily, an end to the investigations and disputations which had been the mainspring for the renown of the Roman College in matters of scholarship and intellectual attainment.

From his commentary we know that Guiducci was surprised and a little shocked by the regressive nature of the steps advocated by Spinola, but from his frank and derogatory comments it is evident that he still did not expect any change in the policy of the Roman College as he had known it.

He declared the proposals by the Professor of Philosophy to

be "trite and commonplace". Spinola, he wrote, should speak of neither old nor new, but of philosophy itself; this oration was for those who candidly thought philosophy to be the common consensus of sages,

"that is, of the writers most accepted today by the schools." ¹²

He rejected the fourth rule of philosophising (in which Spinola had said that cases of dispute where the first three rules offered no help should be settled "in concordance with the testimony of ancient writers); because,

"in that case, I confess ingenuously, that I do not know which of the two may be the true proposition, when one does not prevail over the other by better proof than the concensus of the writers." ¹³

Such authority, wrote Guiducci, is the "last and lowest form of knowledge", and suggested the better method: that if from the early philosophers we have some proposition, having been confirmed with probable reasonings and authority, and for which in the process of time we now have firm experiments or demonstrations to the contrary, then,

"it is the duty of a prudent and good philosopher ¹⁴ to abandon the old and take the new conclusion."

This was the method of Galileo, of which Guiducci was a firm adherent. It was precisely this method which Spinola and those who had placed him in his particular role at the Roman College were determined to exclude, but such exclusion would eventually depress the quality of Jesuit scholarship.

Father Grassi and others like him were, in 1624, struggling

with a middle way. When faced with "firm experiments or demonstrations to the contrary" of some long accepted proposition, they were apparently willing to consider abandoning it. This had already been done by Grassi in An Astronomical Disputation on the Three Comets of 1618, when he had accepted some of the propositions established by Galileo's observations, and had by implication abandoned certain Aristotelian statements.

What Father Grassi would not do in "abandoning the old" was to accept the new conclusion automatically. He wanted additional experiments or demonstrations for the new propositions. With the reinstatement of his friendship with Guiducci in August 1624, these demonstrations seem to have been what he hoped for from Galileo. And without them nothing could be done to withstand Spinola, and the reactionary majority, nor their intent to change the spirit of the Roman College.

Spinola had spoken at length on the need to follow the ancients, but apart from giving a leading role to Aristotle, he had not intimated why some ancients were much more acceptable than others. Therefore, as Guiducci stressed, this guideline of following only the opinions of the ancients was potentially dangerous. In this context, although he does not mention it specifically, he may well have had in mind that the heliocentric theory was also known as the Pythagorean theory.

"But a philosopher who might follow only the opinions of the ancients, such as Pythagoras, Thales, Empedocles and also of Plato and of Aristotle, not only would be driven out, as the orators you described, but would go direct to the Inquisition." 15

The reference to "orators driven out" was to the case of de Claves, Villon and Bitault in Paris, in August 1624. At a later point in the commentary Guiducci mentions "the Parisian doctors", so that we know he was fully informed on the matter.

The Sorbonne, at that time, was a stronghold of Aristotelian philosophy, and in this intellectual atmosphere three men had announced their intention to discuss at a public gathering, on the 24th and 25th August, 1624, a selection of anti-Aristotelian theses and to defend them. They were Jean Bitault, Antoine Villon and Etienne de Claves, all three being followers of the corpuscular theory, and the theses to be put forward were in connection with this.

The first and second theses were concerned with the Aristotelian accounts of matter and form which they declared to be "fallacious and without foundation", while the fourth thesis denied Aristotle's number of elements, and involved a discussion of which constituents could rightly be called 'elements'. Before the intended debate, however, the Theology faculty declared the theses to be "false, temerious and erroneous in faith". As the meeting was assembling, de Claves was arrested and Villon fled.

The French Parlement, on September 4th, issued an order that the theses were to be destroyed in the presence of the writers, all three men were to leave Paris within 24 hours and were not to return to any place covered by the Court's jurisdiction, and were prohibited to teach, discuss or publish the theses. They were also forbidden, by fear of the extreme penalty, to teach any principles against the old and approved authors, or to arrange any disputations

other than those approved by the Doctors of the Theology faculty.¹⁶

At point 74 in his commentary, Guiducci notes an echo of the Paris affair in the suggestions and exhortations of Spinola, and they were not the methods of the Roman College.

"I have found myself many, many times in that College, listening to the disputes. And I have always seen the Masters or Lecturers of Philosophy or Theology contend between them with great vehemence, one never ceding to the other." 17

He continued with reference to the standard manner of disputation at the College, within the prescribed limits of which a contender could argue against an accepted opinion quite safely, no record being made of his arguments. For Guiducci this was the preferred method, but in spite of his knowledge of the Parisian situation and of what he had heard or read in the Spinola lectures he showed no realisation that the Roman College system was in jeopardy. His commentary was intended as a point by point refutation, and there is some possibility that he expected that it could be used as such, if not by himself then certainly by Galileo after suitable augmentation, or perhaps he was intending that the "enlightened" faction within the Society might enter into discussion with himself and Galileo on these crucial issues. Guiducci had resented Grassi's apparent renegade act in deciding to reply against The Assayer, after the renewal of friendship and Grassi's declaration of great interest and sympathy with the new work of Galileo. But Guiducci knew that Grassi was reluctant to write the required paper, knew too that he was the one offering the possibility of scriptural re-interpretation which was so soundly condemned by Spinola. Given

Guiducci's special knowledge of the situation he might well have seen his point by point refutation as potential material for Grassi's use.

When he wrote,

"And I do not know how the Fathers of the College may tolerate that such falsity is said and is written by their lecturers, to so much detriment of their fellows," 18

he clearly still did not understand the dead weight of unenlightened opinion within the Society and the College, the opinion which gave Spinola the authority to pronounce as he did.

For Guiducci, his considered opinion on Spinola's autumn lectures, was,

"This has been a long tirade, and if I am not mistaken more full of bad will than of truth." 19

But it was much more than bad will, it was the closing point. With Father Grassi's An Astronomical Disputation on the Three Comets of 1618 a tentative opening had been made for Galileo. The Jesuits had outlined their proposals for the new world picture, and they had intended that Galileo should accept it or offer further demonstration. But, and this had been mandatory, further demonstration - if indeed he had it - had to be handled through Father Grassi. The Spinola lectures of 1624 were the closing of the argument.

Guiducci did not, apparently, see this, and in his gross misunderstanding, he very happily ended his commentary with reference to Cardinal Bellarmine.

"I, having glanced at the controversies of Cardinal Bellarmine, cannot find there that the heresies of today contradict the Catholic Faith concerning principally the new opinions in philosophy." ²⁰

But Cardinal Bellarmine who had been a shield for Galileo and his thought in the matter of the 1626 Decree, had died in 1621. Father Grassi who had shown, in August 1624, the possibility of viewing Galileo in the Bellarmine manner, had succumbed to some force within the Society which commanded him to make reply against The Assayer.

Reviewing the events of 1624 we can see the growing confidence of Galileo being matched by a growth of determination in the Aristotelian faction. This determination was heralded in Rome as early as January 1623 when Cesarini had informed Galileo that it had been said in the introductory lectures at the Roman College that the discoveries of new things in science were abhorrent.²¹ When Grassi sought so urgently to restore the friendship with Guiducci in order to learn what new material, new demonstrations, Galileo had to offer on the heliocentric system, he was probably aware that the Aristotelians both within the Society and without were becoming very vociferous. He probably feared that the reactionary group headed by Father Spinola intended to reaffirm the old total adherence to Aristotle, as publicly and to as wide an audience as possible.

Father Grassi's attempt to prise new material from Galileo had failed, however, and the "traditionalists" advance continued. This advance was, of course, not welcome to all but it was apparently effective within the Society. In February of 1625 Guiducci informed

Galileo of the progress of the reply to The Assayer, Mario having "heard from a Jesuit" that it had not yet started through the process of publication. Guiducci had told the Jesuit that Galileo was waiting to see the work, in order either to "yield most simply" if Sarsi's arguments were acceptable or to reply yet again if it was "not better than the Astronomical and Philosophical Balance." And the priest said to Guiducci:

"It will not take one side or the other, because on many things Sarsi is not able to oppose, and for some he has a thousand reasonings." 22

"Sarsi is not able to oppose" is an intriguing phrase, because, just as in English, in Italian "is not able to" can be understood as "does not know how to" or "is not allowed". In view of the evidence already gleaned that Grassi was not too happy about writing the reply, one is tempted to accept "is not allowed to". His reply, Ratio Ponderum et Simbellae, finally appeared in 1626, and has been regarded as of little importance by historians of science, containing little more than references to ancient writers, and supports the view that the repression initiated by Spinola was being maintained. In An Astronomical Disputation on the Three Comets of the Year 1618 Grassi had attempted a synthesis of the Aristotelian cosmology and some of the Galilean observations. With the lectures of Father Spinola the pre-1610 cosmology was being re-asserted.

Outside the Society, comments were made which seemed to be aimed at the regressive step of the Roman College. In the same February 1625 letter, mentioned above, Guiducci told Galileo of a meeting in the palazzo of the Cardinal of Savoy. The Cardinal

held a weekly "academy" and here Giuliano Fabbrizi had spoken at length against:

"all the peripatetics, and particularly those who put great foundation in the authority of the writers, and there were present in addition to the Cardinal of Savoy, Cardinal Barberino, Lorenzo Magalotti and others of the Court who listened with great applause." ²³

A fortnight later Guiducci wrote that he did not think Fabbrizi's lecture was made directly against Spinola's introductory lecture because he did not think he would know the contents, but:

"I hear that it was directly contrary to the intention of the Fathers, he (Fabbrizi) having proved that it was a vanity to rely on the authority and number of the authors." ²⁴

Given Guiducci's unique position both at the Roman College and in the Papal household we can assume that his "I hear" would be accurate. He added that he had asked Fabbrizi for the script of the lecture, presumably to send to Galileo, but it had already been handed to Mascardi who wished to include it in a proposed collection of the lectures of the academy. This was, in fact, published in Venice in 1630.

Favaro tells us that Fabbrizi openly condemned those who deferred all to the authority of the writers, who believed what they read more than what they had always seen. Fabbrizi spoke against the shackling and curtailment of the growth of the sciences and the arts, and spoke of the slavery of mind that was being imposed,²⁵ and it is clear that Fabbrizi and his colleagues understood the serious import of Father Spinola's lectures.

The confidence of Galileo, and Guiducci on his behalf, continued

through February 1625. Both Ciampoli ²⁶ and Guiducci²⁷ were pleased to know that Galileo was writing with great energy and that The Dialogues was growing. Ciampoli looked forward to:

"your Dialogues which will bring to light marvels of nature unknown to antiquity."

But by April, Guiducci had begun to feel the effects of the wind of change in Rome and was uneasy about the situation. Evidently it had been intended that Guiducci should now hand to Ingoli the reply to his 1616 paper, but the political climate was deteriorating quickly. At the advice of Prince Cesi the Ingoli reply was to remain with Guiducci until Galileo had been made aware of the new situation.

"I have been much with Prince Cesi for discussion of you and your works. By the advice of his Excellency I have deferred giving to Ingoli the letters written to him, and I will continue deferring until I hear from you, notwithstanding the idea of the Prince, to the contrary. The considerations are these." ²⁸

Guiducci had then outlined the considerations, or new situation, which Cesi felt Galileo should know about before deciding whether the arrangement for Guiducci to hand the Copernican defence to Ingoli should continue as planned.

The details were these: some time before, according to Guiducci, someone had proposed to the Congregation of the Holy Office that The Assayer should be prohibited or corrected. It had been imputed that in it the doctrine of Copernicus concerning the movement of the earth had been praised. One of the Cardinals (not named) undertook the matter and would refer back. This particular Cardinal "lost

heart" and gave the task to Father Guevara, General of the Minims, who after reading the book had praised it to Cardinal Barberini nephew of Urban VIII, saying that the doctrine of the motion wherever it might have been put did not give offence. This had quietened the matter.

Without doubt, Galileo had done a skilful and elegant job in the way he had apparently avoided discussing the Copernican issue in The Assayer and yet kept it in the forefront of the reader's mind. There is no simpler way of putting it than - it is there if you know it is. It was good fortune, as Guiducci wrote, that Father Guevara had been the one to examine the book, he had read it at a simplistic level. Both Cardinal Barberini and the Pope who were well aware of the subtleties, needed only to accept Guevara's judgment since, as we know, they approved the work. The Pope certainly had applauded the manner as well as the contents.

Now, however, Guiducci was worried because as he warned Galileo there were those still trying to "create a fresh disturbance", and "we are lacking the protection of the absent Cardinal Barberini". (Cardinal Barberini had left Rome to visit the Courts of Spain and France as Papal Legate, a few weeks before, taking Father Guevara in his entourage). Access to Urban VIII was suddenly withdrawn: he was "much occupied with war" and therefore not available for advice or comment. Guiducci urgently advised Galileo:

"do not enter into risk, because in the letter to Ingoli the opinion of Copernicus is defended ex professo." 29

The Spinola lectures had marked the closing point of any interest

the Roman College might have had in Galileo's work. Now, a few months later problems of war are so pressing on the time and thought of Urban and his nephew that they too, inevitably, are withdrawing from Galileo. So much Guiducci understood.

"For all these reasons it seems as well, as I have said, to postpone and leave this question asleep, as soon as you touch it it arouses persecutions, and one has to defend oneself from those who can give open blows. In time it may benefit the cause." 30

CHAPTER 10 - References

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2. Ibid. Galileo to Cesi, 8th June 1624.
3. Ibid. Guiducci to Galileo, 28th September 1624.
4. Ibid. Guiducci to Galileo, 30th November 1624.
5. Ibid. Guiducci to Galileo, 15th October 1624.
6. Ibid. Guiducci to Galileo, 18th November 1624.
7. Ibid. Guiducci to Galileo, 27th December 1624.
8. Ibid. Same letter.
9. Favaro on Guiducci, p. 1400.
10. Ibid. p. 1402.
11. Ibid. p. 1378. Favaro records that his attempt to locate a copy of Fr. Spinola's lecture or lectures from the Society of Jesus was unsuccessful. However, he discovered an 18th century copy of a manuscript listing objections to passages from Spinola, purported to have been noted by Guiducci during or immediately after the lecture, and Favaro gives the following reference: Manoscritti Galileiani, Parte VI, Tomo IV, Appendix entitled '3 Galilei copies of documents', Florentine Collection.
12. Ibid. p. 1397.
13. Ibid. p. 1403.
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15. Ibid. p. 1410.
16. Kurd Lasswitz, Geschichte der Atomistik vom Mittelalter bis Newton, 2 vols. Voss: Hamburg and Leipzig 1890, p. 482.
17. Favaro on Guiducci, p. 1416.
18. Ibid. p. 1417.

19. Ibid.
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26. Ed. Naz. Vol. 13. Ciampoli to Galileo, 15th February 1625.
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29. Ibid.
30. Ibid.

CHAPTER 11

Conclusion

It has been my purpose to discover in what ways Galileo could be seen to have affected the beliefs of certain Jesuits, many of whom had also to take into account how their colleagues within the Society, the world of Catholic scholars and, importantly, the prospective converts in the areas of Counter Reformation attack might react to the new astronomy and the many diverse implications claimed for it by widely differing groups.

In researching these aspects of Jesuit reaction I have sought, so far, not to stray into the tempting area of speculation, remaining close to a chronological account derived mainly from the Galilean correspondence - but one which has yielded new information. Inevitably, there is more to be made of the straightforward account, some of which I will outline in this final chapter.

Absence of a Directive

I have referred to the Jesuit reaction although for the period 1610 to 1625 we cannot speak of the Society of Jesus as a monolithic structure insofar as their beliefs and views were concerned, if indeed it were ever the case at any time. For the main part the majority of them apparently adhered to the rules of obedience, but in regard to the new issues concerning the nature of the physical world which emerged with the publication of Starry Messenger many Jesuits were able to utilise their casuistic gifts to a fine point.

We saw this with Tanner who delighted in the new work, who

taught it to his graduands engaging them in debate to ascertain the nature of the new stars - were they miraculous or natural? He apparently only withdrew from further applause and approval when Father Scheiner became too open an advocate for the anti-Aristotelian aspects of Galileo's work. That Galileo's work and the Aristotelian account of the Heavens were mutually exclusive on several points should have been immediately manifest, certainly to a scholar of mathematics and astronomy of Tanner's standing. However, he seems to have been more concerned that Scheiner might have been speaking on and teaching overtly anti-Aristotelian views, than that the Galilean work put forward propositions which opposed the Aristotelian cosmology. In other words the new work was exciting to read and discuss even with his students. The observations could be repeated, the nature of the new stars debated, whilst the effect on the Aristotelian world-picture might be skilfully evaded.

In the absence of a directive there was no rule to obey and as we have seen the decision to remain strictly with the Aristotelian cosmology was not initiated until 1625. When Father Scheiner spoke approvingly of the newly discovered stars of Galileo and issued, under pseudonym, his own sunspot observations, so that Aquaviva had felt it necessary to restrain him from writing further on "the fluidity of the Heavens", ¹ he was relegating publicly a major tenet of the Aristotelian view. ² The Society of Jesus adhered to Aristotle in all matters physical and supported the Scriptural/Aristotelian cosmology. Open denial of Aristotle's immutable and incorruptible Heavens was, therefore, cause for concern. The new telescope which was increasingly available showed a very different picture, nevertheless a move by Jesuits from such a basic principle of their earlier

teaching could be seen as disobedience, or at best disloyalty.

Adam Tanner, at Ingoldstadt, had seen this sooner than had Scheiner, who apparently wanted to attest to the Galilean view of the Heavens until Aquaviva forbade this. Earlier rebukes from his colleagues had not deterred Scheiner from voicing his new opinion.

But when Aquaviva did write to Scheiner it was by no means a clear cut directive. It applied personally to Scheiner and Hartel, head of the German Province, was requested to ensure that Scheiner did not write or put forward views promoting the fluidity of the Heavens. As in the later Decree of 1616, relayed to Galileo by Bellarmine, Aquaviva's letter did not refer to Galileo by name. He did say of the new observations that they were displeasing, not erroneous, but so far as I can ascertain he put no restriction on other Jesuits who might wish to discuss Galilean views. The directive was singular and applied only to the publication of approval.

In essence this was a precedent for the manner in which Cardinal Bellarmine handled the 1616 Decree. It was, in both cases, as though the publicity of the new views was the offensive factor, a publicity which preceded a definitive account by the Society. The difference with the later case concerning Cardinal Bellarmine was that the Cardinal acted by Papal decree, although he had played a leading role in the advisory group and the method of detailing the Decree to Galileo was his own. However we may surely assume that such limited Jesuit policy which had been formulated at that point was incorporated in the audience of 1616. Both Aquaviva and Bellarmine appear to have been intent only upon quietening outspoken comment and discussion.

There were several other examples of this attitude. From 1610 right through the years until the Spinola lectures of 1624 there were influential Jesuits who, although not necessarily accepting nor approving of the emerging cosmology implied by Galileo's work, tried to calm and subdue the tide of discussion it provoked, as though waiting for Galileo to finish what he had started. Father Clavius pointed to the need for change and was followed in varying ways by Aquaviva, Bellarmine and Grassi. For all these Jesuits, their reaction to the new work can be construed as the unwelcome acceptance that the standard cosmology had been ruptured, coupled with the fervent determination to ascertain the extent of the possible alternative cosmology; as though then and only then could a major reassessment take place.

Father Clavius, before his death, had written that something should be done concerning the new findings which showed a view of the Heavens vastly different from the accepted theory.³ Cardinal Bellarmine, in 1614, and Father Grassi, in 1624, had mooted the possible reinterpretation of certain Biblical passages which had long been understood to support a geocentric universe, if and when Galileo should produce demonstration of heliocentrism.

In their approach to the Galilean problem, Clavius, Tanner, Bellarmine and Grassi had a basic similarity in their acceptance that Galileo's work had to be looked at thoroughly and that its strength be evaluated. Their apparent intention that this should be done with minimum exposure was shared by Aquaviva. I suggest that this common approach may well have been attained by common

consent, in that the network of personal and correspondence links between these individuals were such that they could each have been aware of the views of the others.

Tactical Error by Galileo

The Guiducci/Galileo/Grassi relationship was a determined effort to ascertain the strength of Galileo's work and to monitor new information when forthcoming, in order that the observed cosmology could be aligned with that of Aristotle. With Father Grassi's An Astronomical Disputation on the Three Comets of the Year 1618 we saw the first Jesuit attempts at such synthesis, a synthesis abruptly and rudely rejected by Galileo through Guiducci. This was a major tactical error by Galileo and one that is quite surprising. The whole tone of the paper to be delivered by Mario Guiducci in answer to the first disputation by Father Grassi concerning the bright comet was unnecessarily derisory.

I have outlined my view as to the reasons Galileo may have had for choosing to direct an answer to that particular paper and I have shown that there were several aspects of the Society and of Father Grassi's disputation about which Galileo felt decidedly bitter and possibly betrayed. Nevertheless, Galileo's denigrations of the Jesuit astronomer and his arguments contrast sharply with other of his works. When replying ostensibly to Mark Welser but in truth to Father Scheiner concerning sunspots,⁴ and later in The Assayer in reply to Father Grassi, he shows that he can be witty at the expense of an opponent: witty but not stinging; he can

be condescendingly instructive, and he can be kindly. What then happened with the Discourse on the Comets which Guiducci was to offer to the Florentine Academy?

It is an important question since further difficulties for Galileo follow from this point. This was not because, as Viviani suggested, (see Chapter 1) the bitterness of his written jibes caused such a breach that the Society never forgave him, rather because his rejection of their first tentative synthesis of the old cosmology and the newly discovered bodies in the Heavens publicised a split in the intellectual foundation of the Society.

The initial launching of Father Grassi's disputation took place in the comparatively quiet atmosphere of the Roman College, where disputations were part of the common round and where it was a well established teaching method to put forward unacceptable theses, in order that the students in defending or disputing the theses could acquire that art of argument and polemic which would be a necessary attribute in their later missionary work.

Had Galileo acceded quietly to Grassi's work, to the temporary synthesis of old and new cosmology, then a certain measure of obscurity might have been retained while further discussion and amendments were undertaken. With the huge blaze of publicity following Guiducci's reply for the Florentine Academy, all Europe was made aware of a Jesuit faction willing to reject certain Aristotelian tenets. The very foundation of Jesuit scholarship was being challenged from within.

If Aquaviva, Bellarmine, Grassi and no doubt many other Jesuits

had hoped that any adjustment to the world-picture could take place quietly and gradually, Galileo had shown in a widespread and humiliating manner that it could not be done that way.

How could Galileo, master of duplicity and doubletalk, the charmer of intellectual circles and the schemer who through his vast network of correspondence and confidants, was kept informed of opposition and sympathy, make so gross an error of judgement? In 1611 he had wanted Jesuit dialogue above all other discussion, at a time when very many of the European scholars were eager to debate and dispute Copernicanism with him. Now when this issue was halted by the 1616 Decree, one might have expected him to accept - if not to welcome - this one tentative overture from Grassi. I have said earlier that he was still bitter at the apparent Jesuit withdrawal of interest during the years 1612 to 1614, but that his bitterness should have overridden his well established skills for opportunism and expediency was sheer folly and a very different reaction from his usual calculating care for his own advancement.

I can offer two possible suggestions for his tactical error, regretfully neither is conclusive. In The Assayer when writing of the small part he allegedly played in the preparation of Mario Guiducci's Discourse on the Comets, Galileo tells us that he himself was ill and in bed during the autumn of 1618. As we know, so many of the illnesses at that time were febrile in character and it may be that temperature-heightened feelings played a formulative role in the material he proffered to Mario.

Another possibility lies in the nature of the relationship

between Galileo and Guiducci. I have put forward the view that Guiducci was a carefully chosen go-between, intended by some members of the Roman College to elicit details of Galileo's continuing work for them to study. That this was the case, I suggest has now been established. However in this particular relationship there were variations on the intended theme. Guiducci retained his allegiance to the Society and to the Roman College and performed well the task which they had allotted to him, but there is no doubt that he came strongly under the influence of Galileo, giving him affection and admiration for his remaining life-span, a matter of some twenty-seven years.

These then were very strong ties and it may be that with his growing affection for Galileo, Guiducci always misread and confused the views of his masters at the Roman College. In his letter to Father Tarquinio we saw strong evidence that this had been the case with some aspects of his alleged paper Discourse on the Comets. Galileo in formulating tactics, following the strong invitation by Mario to offer a reply to Father Grassi's An Astronomical Disputation on the Three Comets of 1618, may well have been given totally wrong cues. It is an area one would wish to study more closely, although this might prove unusually difficult since, as Antonio Favaro has noted, there is a surprisingly large amount of material for the year 1619 - papers and correspondence - missing from an otherwise well-documented field. ⁵

The Reinterpretation Issue

I have discussed the suggestion, made by Father Grassi to Guiducci after their reconciliation in 1624, that reinterpretation of certain Scriptural passages might be possible (as Cardinal Bellarmine had written in 1615) were Galileo to produce further demonstrations of heliocentrism. Cardinal Bellarmine's known commitment on this issue was contained in the Foscarini letter and was a carefully guarded statement. It appeared to me that if Mario Guiducci's reporting of Grassi's words was accurate, then Grassi was not referring only to the Foscarini letter which had been written nearly ten years earlier, but to some other - more easily remembered - recent reference, possibly to some conversation or correspondence to which Guiducci had had access. A further study on this issue might show whether the tentative suggestion of reinterpretation was envisaged by a wider group than Bellarmine and Grassi; and if so, the extent to which this possibility was known and regarded as a serious programme.

Guiducci certainly accepted Grassi's offer at face value. He was clearly pleased, yet apparently not at all overwhelmed at what would surely be regarded as a momentous step and I have wondered whether on his many visits to the Roman College and in conversation with those for whom Father Grassi acted as spokesman on public occasions, he had perhaps heard this possibility of Biblical reinterpretation being advocated.

We know that prior to the Decree of 1616 the reinterpretation issue was live and important. In March of 1615 Dini had written

to Galileo about a conversation Dini had had with Cardinal Bellarmine on this very point.⁶ The Cardinal had said there was no greater obstacle to Copernicanism in the Bible than a passage in Psalm 19 which speaks of the sun "exulting as a strong man to run his course". When Dini had suggested that this might be merely expressive language Bellarmine's reply had been cautious, but had declared an interest in any interpretations on such passages that Galileo might have produced.

We know from the correspondence that Copernicanism and reinterpretation of Scripture were major topics in 1615, however, after the Decree I found no further evidence of the reinterpretation issue until Grassi discussed it with Guiducci in 1624.

In 1624/25, in his series of lectures at the Roman College directing the students and invited audience to maintain adherence to Aristotelian physics and cosmology, Spinola declared Biblical reinterpretation to be completely out of the question. It is fairly evident that he was responding to more than either the gossip in Rome in 1615 or Bellarmine's letter to Foscarini of April 1615. I can only assume that this issue had grown up in the intervening years to unmanageable proportions so that it now required the force of official Roman College denial to quell the rumours and gossip.

How this analysis of the 1610-24 period might illuminate the later Galilean history

There are two main periods in the Galileo history: the first extending from the publication of the Starry Messenger in 1610 up

to the appearance of The Assayer in early 1623; the second from 1630 when the manuscript of Dialogue concerning the two chief world systems was first available in Rome until the trial of Galileo in 1633. There were, and still are, a large number of anomalies in both periods although perhaps inevitably, because of the greater interest and fascination for historians in the dramatic detail of the trial, historical research has been concentrated on this later set of events.

This factor of overdue concentration on the publishing details of Dialogue concerning the two chief world systems and of the trial itself has obscured trends and incidents from the earlier years, which might have been pointers to the underlying causes for Urban's apparent disaffection in 1633 with the latest Galilean work and the Jesuit role in the Pope's reaction. The often quoted view that the Jesuits convinced Urban that the foolish Simplicio character was the one chosen by Galileo to convey the Pope's own views, thus causing Papal wrath and the consequent trial, is too trite and unconvincing. We should look to the earlier years for other reasons why the Jesuits might have chosen to set Urban and Galileo on the collision course leading to Galileo's indictment.

If the possible misinterpretation and misuse of the astronomical discoveries of Galileo, by many who indulged in magical or astrological practices, were a source of worry to the Jesuit Society, they must certainly have been shocked by the close relationship which was forming between Urban VIII and Campanella in the late 1620s. Tomasso Campanella, formerly a Dominican, had been

jailed by the Spanish in 1599 for heresy. He was released in 1626 only to be imprisoned in Rome, where he was freed in April 1629 by Urban VIII ⁷ and for a few years a noticeable bond existed between them.

The nature of this bond has been suggested by D.P. Walker ⁸ to lie in a search by the Pope for remedies from Campanella against the early death predicted for him by certain astrologers; ⁹ and it is suggested that together they practised magical rites to ward off the power of the impending conjunctions. ¹⁰ The news that the imminent death of Urban VIII was being predicted spread very quickly, and to such an extent that the election of a new Pope was being spoken of. ¹¹

The magical rites in which the Pope himself, ¹² and Campanella, was apparently involved were, in the terms of Sixtus' Bull, plainly illicit; thus far had the great wave of ungodly attachment spread.

There were rumours too that Galileo was predicting the death of the Pope. ¹³ The extent to which Galileo and the unexpected friendship between Urban and Campanella might have been linked in the corporate thinking of the Society has not been discussed here, but we must assume that the possibility would be investigated as part of the Vitelleschi anti-astrology programme.

This potentially fruitful area of study ¹⁴ as a sequel to this current work is one which might be entered by researching the continuing role of Father Scheiner after the correspondence on sun spots.

It has been suggested that the effect of the Starry Messenger

on Father Scheiner caused his colleague Father Tanner to request Aquaviva to restrain Scheiner's newly avowed anti-Aristotelian opinions. Father Tanner had been dismayed at the manner in which Galileo's observations of vastly extended Heavens and innumerable new stars could be used by the magicians, the astrologers and by all those interested in occult possibilities and explanations.

That Father Scheiner was restrained to the extent that he temporarily dissociated himself from further work, until with the advent of the new General of the Society, Vitelleschi, he was pressed into resuming his studies, has been mentioned earlier. But what of Father Scheiner in the later period of Galileo's life? There is some evidence that he played a larger role than hitherto suggested in the events leading to Galileo's trial. It has been suggested by historians that because of pique at Galileo's priority claim in the matter of solar spots, Scheiner was one of those who had tried to have Galileo's The Assayer prohibited,¹⁵ and I suspect Scheiner's role may have had greater motivation than pique and greater influence than previously understood.

After Vitelleschi's request in 1617 that he should resume work on his scientific investigations, Father Scheiner has apparently disappeared from this account. It may be, however, that he re-entered the Galileo story in 1624, when he moved to Rome, where he remained until after Galileo's trial although,¹⁶ ostensibly, his sojourn in Rome was to be merely a short stop-over prior to moving across Europe on a mission. In the event his companions continued their journey and Scheiner remained in Rome for several years. Professor Drake has also suggested that Father Scheiner

may have been one of those behind Father Grassi urging him to continue his dispute with Galileo.¹⁷ From August to October 1634, a year after Galileo's trial, there was correspondence between Vitelleschi and Scheiner.¹⁸ Vitelleschi had congratulated and encouraged Scheiner on his work "against astrologers" and hoped after a quick ending to that struggle he would find time to do his work against the Copernicans, and Scheiner had replied telling of his joy over the encouragement to the struggle against the Copernican dogma and the astrology.

But who had these astrologers been? Vitelleschi did not refer to any by name, but this category could obviously include Galileo and his pro-Copernican colleagues and correspondents, and also all those who had been excited and alerted by the magico/astrological potential in the Galilean discoveries in the Heavens and by the whole Copernican debate. Almost certainly it also included Campanella whose undue influence over Urban VIII had been achieved and maintained by means of astrological lore, until this had gradually diminished by about 1632.¹⁹ It seems implausible that Scheiner could have affected Urban's penchant for protective magic and astrology but there is a close time relation between the early problems for Galileo with the Dialogue concerning the two chief world systems, the printing of which was completed in February 1632, and the apparent cessation of Urban's close interest in astrology.

It would seem that had Scheiner been instrumental in Galileo's disgrace, he may have achieved several goals at the same time.

Writing to Gassendi in 1633, after Galileo's imprisonment,

Niccolo Fabri di Peiresc ²⁰ wrote of Scheiner's continued harrassment of "that poor old man" (Galileo) and of his part in the ultimate imprisonment. It is in this same letter that di Peiresc wrote of a hasty visit from Father Kircher and how Kircher had spoken at length against Scheiner saying that it was only by force and obedience that Scheiner had been made to return to the propositions of Aristotle.

Athanasius Kircher, Jesuit, is largely discredited by modern historians as a dubious scholar, one with strange predilections for exotic and obscure subjects. This is not how he was judged in his time, and R.J.W. Evans in The Making of the Habsburg Monarchy has given a profile of Kircher and his position in his own extremely extensive circle ²¹ which suggests that his views on Scheiner's role in Galileo's condemnation would be well founded. Kircher, based in Rome at the centre of the Society of Jesus still maintained intimate links with the Habsburg court and was ideally placed to glean detailed information concerning invisible control within the Society of Jesus.

Galileo himself apparently saw Scheiner behind his own downfall. When writing to Alfonso Antonini in 1638, ²² Galileo discusses his early relations with Scheiner and the ensuing problems. A close study of Father Schiner from the point where Vitelleschi became interested in him in 1617, to the time when Vitelleschi's congratulatory letter suggests the completion of a joint venture, could well yield information on how Urban VIII turned against Galileo and any part played by members of the Society.

This analysis, of the crucial years between Galileo's arrival in Rome and Spinola's reaffirmation of Aristotelian adherence may suggest a new approach to a study of the later period. It shows also that the conflict surrounding Galileo was not, as suggested by one of our historians "good science versus bad science", nor was it ever a true confrontation between Church and Galileo. The scientific issue came into the dispute only in a limited manner, and when it did Galileo was as guilty as his opponents in proffering bad science when it suited his purpose.

It was unfortunate timing that his new earth moving observations shook the basis of Jesuit scholarship in a period when the Society felt it necessary to maintain a united front for the greater efficacy of their Counter-Reformation effort. This was something which could not have been avoided. Galileo could only make his observations when the telescope had been devised and after he himself had produced lenses of greater precision.

The conflict between Galileo and a section of the Society of Jesus, however, was almost a personal one, and was not a matter of timing. Jesuits like Grassi attempted to assimilate the Galilean revelations piecemeal into some kind of synthesis, and yet Galileo who had most to gain from their efforts rejected the overtures, certain that he had demonstrated a heliocentric universe. The most surprising factor here was not that he remained totally and immovably convinced of the truth of his own vision, but that he would not debate with the group who approached him through Guiducci. He pointed out the split in beliefs within the Society but would not move into

a dialogue which might have widened the breach further and possibly helped his own cause.

On the matter concerning the ways in which his work could be used by those interested in magic and astrology, Galileo was equally obtuse. He knew of these illicit extensions of his discoveries and belonging as he did to such a close-knit intellectual group which included so many high ranking ecclesiastics, he almost certainly knew how gravely the Society viewed the wave of witchcraft, magic and astrology which threatened the success of the Counter-Reformation. Nevertheless he continued to disregard the problems he and his work were causing, issuing a wave of invective against Father Grassi's attempts to synthesize, thus provoking further speculation and rumour and scandal. The Society was the foremost scholarly group in Europe which is almost certainly why Galileo sought its validation and evaluation in 1611. He totally ignored the fact that its main care and cause was the saving of souls and that in this his campaign was a hindrance.

Historians in the twentieth century hailed Galileo as the first scientist, seeing his determination to emphasise measure and quantity, whilst discounting qualitative factors, as evidence of a radical free thinking mind, but this is not fully supported by examination of his life style. His innovative faculties, his undoubted powers of analysis, were trained rigidly on aspects of the physical world and on the new cosmology he strove to establish, leaving little of intellectual weight for other matters.

In spite of the suspicion which seems always to have clung

to him, he appears to have been totally disinterested in the realms of magic and astrology which occupied the minds of so many scholars. Certainly for him to have indulged in the activity of magic must have been opposed to his fundamental premise that the operative power of mathematics could show the way in which effects in nature were related. Nevertheless, one would have expected a lively mind like that of Galileo, a mind interested and alert concerning topical matters to have sharpened his analytical wit in the continually circulating discussions on magic; and yet it seems in no way to have been part of his interest.

Again, in religious matters where his contemporaries argued and debated the pros and cons of the great Tridentine issues, Galileo displayed little of his philosophical strength. In the magic issue he had stood aside; concerning religion in general he merely acquiesced. This may be a surprising statement to make of the author of the letter to Castelli, but it is one which can be supported.

The letter to Castelli,²³ in which he gives personal interpretation of Biblical texts and the expanded version which he wrote to the Grand Duchess Christina where he delineates the limits of Biblical truth,²⁴ express powerful innovative thinking, but this is done only in defense of his science and not as part of a general discussion on topical issues of the faith. The nature of the physical world was the focus of his prime mental activity and he questioned elements of the religious code only where they affected or interfered with his major interest. In the matter of living his day

to day life he seems to have fulfilled the requirement for a good Catholic.

Grassi proclaimed this fact publicly and the letters to Galileo from his daughter, herself a nun and having full cognisance of his daily round, suggest that she was well satisfied with his religious conduct.²⁵ Concerning the major part of his religion he seems to have been unquestioning, accepting the Church as a basis for living in the same manner that he accepted and retained the belief in circular motion.

There was difficulty in this for the Jesuits who were interested in his work, because they had little else beyond his astronomical discoveries and his work on mechanics by which to assess the value of his contribution. In two major areas of contemporary discussion Galileo had not taken part. In his astronomical work he stood alone, and when they tried to engage him in debate, in 1619, he refused to participate. It was inevitable then that they should move against him, but not before several attempts at dialogue had been made and rejected.

It was never plausible that the Jesuits rejected his work without scrutiny, but a deeper insight into the true reasons for such rejection may have been gained by studying the very detailed surveillance they made of Galileo, the man, his life style, and his colleagues.

CHAPTER 11 - References

1. B. Duhr, Geschichte der Jesuiten in den Ländern deutscher Zunge. Herdersche Verlagshandlung: Freiburg im Breisgau 1913, Vol. II.2, p. 438. Duhr quotes Aquaviva as informing Scheiner that he should bring out no new hypotheses concerning the "fluidity of the Heavens or of the stars moving like fish in the sea or birds through the air."
2. In 1622 Campanella was to write in Chapter 2 of The Defense of Galileo that Fictus Apelles had looked with favour upon the hypothesis of Galileo and Copernicus, indicating that Scheiner's earlier leanings away from Aristotelian cosmology were known outside the confines of both Ingoldstadt and the Society of Jesus.
3. As in Reference 6 of Prologue: S. Drake, Galileo at Work, University of Chicago Press: Chicago 1981, p. 487, fn. 19, where Drake gives the following reference - C. Clavius, Commentarium in Sphaeram, Mainz 1611, p. 75 in Vol. 3 of the collected works of Clavius, published 1611-12.
4. These letters were dated 4th May, 14th August and 1st December of 1612, see Ed. Naz. Vol. 5, pp. 20-259, and Drake, Discoveries and Opinions of Galileo, Doubleday and Co. Inc.: New York 1957, pp. 59-144.
5. Favaro on Guiducci, p. 1362.
6. Ed. Naz. Vol. 12. Dini to Galileo, 7th March 1615.
7. Luigi Firpo, 'Filosofia Italiana e controriforma', Rivista di Filosofia Italiana, Vol. 41, 1950, pp. 391-2.

8. D.P. Walker, Spiritual and Demonic Magic from Ficino to Campanella, The Warburg Institute: London 1958, p. 206.
9. Luigi Firpo, 'Filosofia Italiana e controriforma', p. 393.
10. Walker, Spiritual and Demonic Magic, p. 207.
11. Ed. Naz. Vol. 14. Antonio Badella to (not known), 18th June 1630.
12. Walker, Spiritual and Demonic Magic, shows that the magic being attempted by Urban and Campanella became known through an account being inadvertently enclosed with work sent for publication, and was included in Campanella's De Fato siderali vitando, being the 7th book of his Astrologica, published Lyons, 1629 and that Urban was extremely angry that his involvement was made public. See pp. 207-8.
13. Ed. Naz. Vol. 14. Antonio Badella to (not known), 18th June 1630.
14. D.P. Walker, in a book review entitled 'The Pope's Horoscope' in The New York Review, 30th January 1969, also feels there are strands within the "background of panic-stricken superstition, sun and star worship ... against which the trial (of Galileo) should be seen."
15. Drake, Galileo at Work, p. 300.
16. Ibid. pp. 291-292.
17. Ibid. p. 291.
18. Duhr, Geschichte der Jesuiten, Vol. 11.2, p. 473.
19. Campanella moved to France in 1634, where he died five years later, Ed. Naz. 20.
20. Ed. Naz. Vol. 15. Niccolo Fabri di Peiresc to Gassendi, Septemb 1633.

21. R.J.W. Evans, The Making of the Habsburg Monarchy, 1550-1700, Clarendon Press: Oxford 1979, pp. 433-42.
22. Ed. Naz. Vol. 17. Galileo to Alfonso Antonini, 20th February 1638.
23. Ed. Naz. Vol.5. Galileo to Castelli, 21st December 1613.
24. Ed. Naz. Vol. 5 pp. 309-349.
25. There was a regular correspondence between Maria Celeste Galilei and Galileo. Of those letters collected in the Edizione Nazionale some are written every few days, some are monthly. They were clearly in close contact, they discussed family matters and Maria Celeste spoke of her colleagues and superiors. They performed tasks for one another, Maria Celeste writes of attending to Galileo's clothes and of him mending her windows. A selection of letters can be found in Ed. Naz. Vol. 13, all from Maria Celeste to Galileo, Autumn 1623, 11th November 1628, Christmas 1628 and of December 1628.

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