



18 April 1970

Address to the Plenary Session and to the Study Week on the Subject 'Nuclei of Galaxies'

The Supreme Pontiff, who cites Pius XI's idea that the Academy is a 'scientific Senate', declares that it can provide a 'solid basis upon which believers can reflect for a fruitful dialogue with scientific thought'. He also wonders whether other pontifical Academies should not be founded for other areas of knowledge. He goes on to say that reason 'is not and cannot be opposed to faith'; indeed, they help each other reciprocally. He also points out that the scientific study of the universe leads 'towards the invisible which is the source of the visible'. Such observation elevates man and gives meaning to his existence by drawing him closer to God. The flight of Apollo 13 had been a part of this process.

Excellencies and Gentlemen,

We thank you heartily for the delicate sentiments just expressed to us by Reverend Father O'Connell in the name of his illustrious colleagues. As you know, we are always happy to welcome the members of our Pontifical Academy of Sciences, in the presence of the diplomatic corps and distinguished personalities. We also experience a certain emotion to see such qualified representatives of the entire world gathered together, a veritable Senate of scholars, at the head of scientific research and of reflection which it stimulates in the human mind. Is not the subject of your work, devoted to the 'nuclei of galaxies', a striking sign of this?

1. Your plenary session marks an important moment in the life of the Academy, and we rejoice in this. For this institute remains highly significant: it can bring to our world appreciable help by the competency and universality of its testimony, and also provide a solid basis upon which believers can reflect for a fruitful dialogue with scientific thought. What roads have been travelled since the foundation of the Academy of the 'Lincei' in 1603, its revival by Pius IX, its enlargement under Leo XIII, and especially its reconstitution by the enlightened care of our great predecessor Pius XI, with the Motu Proprio of October 28, 1936, *In Multis Solaciis*, under the name of the Pontifical Academy of Sciences, comprised of seventy Pontifical Academicians 'a Senate of learned men, as it were, or a scientific Senate to promote the progress of the sciences', under the presidency of Father Agostino Gemelli of happy memory.¹

Illustrious scholars have never ceased to honour the Academy by their presence and their work, and we ourselves, yesterday, had the joy of adding to this select Cenacle twelve new members who provide a better representation of the ensemble of teachers who cultivate the scientific disciplines with success throughout the world. Your studies of mathematical and experimental sciences, carried on with the liberty that is proper to culture, have certainly contributed to the progress of pure science, and prepared the progress of applied sciences. But should not such a development be extended to other domains today? While continuing your specialised researches whose importance does not cease to grow – experiences of the flights into space, the most recent of which we have followed these past days with anguish and, at the end, with thrilling joy and admiration – would it not be desirable and opportune to foster, in other Academies, other disciplines that are also essential to the human spirit, such as arts and letters, philosophy, law, history, economics, sociology, and the human sciences that characterise so profoundly the men of our times? This morning, we wish to entrust to you this thought upon which we have meditated for a long time and which, in our mind, is more than a dream: a real desire which it would please us to realise.

2. The very nature of your work prompts us to underline two principles of which you are already convinced, and to which your own experience (we could say: your personality) bears witness every day. The fact that reason, however advanced it may be, is not and cannot be opposed to faith: 'Science which is the true knowledge of things is never contradictory to the truths of Christian faith'.²

Moreover, both faith and reason can be integrated in the unity of knowledge, while keeping their respective autonomy, as the first Vatican Council teaches: 'Faith and reason ... are a mutual help to each other'.³

Understand us well. According to the pastoral Constitution *Gaudium et Spes* which 'recalls the teaching of the first Vatican Council', the Church 'affirms the legitimate autonomy of human culture and especially of the sciences', with 'their own principles and their proper method, each in its own domain'.⁴ But these sciences which can so well 'elevate the human family to a more sublime understanding of truth, goodness and beauty,

and to the formation of judgments which embody universal values',⁵ can also prepare man to discover and accept the whole truth, provided these sciences do not incorrectly consider 'the methods of investigation which these sciences can use as the supreme rule for discovering the whole truth'.⁶ It is the same God who has created the world with its laws which you scrutinise – 'all things in heaven and on earth, everything visible and everything invisible'⁷ – and who reveals Himself to men and brings them salvation in Jesus Christ. The same human spirit is capable of scrutinising the secrets of creation and 'of conquering the earth',⁸ and at the same time, of discovering and accepting 'under the impulse of grace' the gift God makes of Himself to man, 'The Word of God who, before He became flesh in order to save all things and to sum them up in Himself, "He was in the world" already as the true light that enlightens every man'.⁹ How could the Church not encourage the investigation, the discovery, and the conquest of this universe which, with its marvellous and admirable riches, leads us, from the infinitely small to the infinitely great, towards the invisible which is the source of the visible?¹⁰

3. But the subject you have just taken up, 'the nuclei of galaxies', deserves special attention. Our imagination becomes baffled and leaves us filled with amazement, as though overwhelmed, almost crushed by the immensity of the perspective unfolded, 'the silence of infinite spaces' so dear to Pascal. We follow with profound respect and great interest your patient work of observation, the coordination of experiments, and the formation of scientific hypotheses on the origin or evolution of astral worlds.

Does this mean that human thought exhausts all its possibilities at the level of these investigations?

In the background of these investigations, there is the problem of the very being of this cosmos, of this universe: the question of its existence. You remain, in fact, in scientific experimental observation, of a mathematical and cosmological order. But what prevents the mind, on philosophical grounds, from the possibility of ascending to the transcendent principle, to the Creator, '*causa subsistendi et ratio intelligendi et ordo vivendi*'?¹¹ Too often today, we doubt this power. 'The more science, while perfecting its methods, subjugates the world to man, the more being, which in reaction does not let itself be subjugated, evades him ... then comes the temptation to agnosticism'.¹² But we cannot maintain such an attitude. 'The intelligence absolutely cannot abdicate; it cannot renounce its formal law, which is to judge, that is, always affirm'.¹³ For the human mind, it is like 'an irrepressible need to possess, at every moment of its temporal experiment and in each state of its knowledge, an explanatory idea of the ensemble of things'.¹⁴

We often speak of the 'death of God'. But should we not rather speak of the death of man and of his thinking in its superior form? Without this recourse to God, the source of Being, man's thinking seems to become engulfed in the darkness and incomprehensibility of things, in the ignorance of a unity which presides over them, and of the finality of a mysterious order which is inseparable from them, leading to an absurdity which exists only in its own making. Perhaps you are better spared than others from what must be called a true sickness of the mind, you who scrutinise objectively the sciences of nature, of astrophysics, of physics.¹⁵ For the intelligence, by its very activity (if it does not remain in the external appearance of reality), rises to the level of its transcendental cause, the real Absolute, Who gives consistency not only to all creation but especially to the human spirit, without ever becoming identical with them. As has been happily said, the intelligence is 'necessarily a power of assimilation as well as a power of ascent ... It understands in all realities that by which realities are, that is, realities open towards the illumination of the act. And thus, it can be rightly said that the intelligence is the sense of the divine, the avid and skillful faculty of recognising the traces of God'.¹⁶

Here you have, it must be repeated, a natural development of thought, in its fundamental logic, and not an unjustified leap as claimed by an anti-metaphysical mentality improperly defined as scientific. True science, far from arresting the thrust of thought, constitutes a springboard which enables it to rise, in this very thrust, towards the One who generously provides it with food. For, 'the spirit itself is a road that travels ... We cannot get along without God'.¹⁷

We are amazed, as we said before, in the presence of your studies on the nuclei of galaxies. The solar system already appeared so vast and so mysterious to our predecessors! But for all that, we are not disconcerted, knowing that 'God prefers rather to create beings in their seed in order to lead them subsequently to their blossoming'.¹⁸ Time and space, matter and form, can develop in a limitless way, indefinitely, as it were.

While listening to your teaching, we find assurance in our faith. And to our mind, to us who are in the school of faith, come the words of Holy Scripture: 'God created the heavens and the earth ... And God saw that it was good ... God saw all He had made, and indeed it was very good'.¹⁹ This joy God experienced in the presence of his creatures, why should we not have this same joy towards our Creator?

In our turn, we contemplate this mysterious beauty and goodness of creation. All these beings cry out to us, as they did to St. Augustine: we are not God, but it is God who made us. 'Ecce caelum et terra clamant quod facta sint'.²⁰ And Him we adore! The meeting with God is wrought before the quasi-limitless grandeur of his works (is it not a grace to be initiated in this grandeur?), in joy, in admiration, in prayer, in the adoration of the

One who 'in bestowing thousands of graces ... hurried through these forests, and while beholding them ... left them clothed with his beauty'.²¹

At the conclusion of this contemplation of the supreme realities of the cosmos in their meeting with the supreme truths of the human mind, we cannot silence our emotions, our admiration, our satisfaction which are those of the entire world at a happy ending – yes, happy, very happy, even if the main aim of the adventurous flight of Apollo 13 was not achieved. All of you have certainly followed, with apprehension and then with joy, the unfolding of this extraordinary undertaking. And you will undoubtedly make it a point to congratulate warmly with us the valiant astronauts who have escaped the dangers of this grandiose flight, and to render homage to all those who, by their studies, their activity and their authority, have once again brought before the eyes of the world the limitless power of sciences and modern technology. You will also raise with us an ardent hymn of gratitude to God, Creator of the universe and Father of men, who, by these paths also, wishes to be sought after and found by man, adored and loved by Him.

Such are the thoughts, Excellencies and dear Sirs, suggested to us by this very pleasant meeting. With all our heart, we encourage you to pursue your scholarly work, to pool it in an unselfish manner, beyond frontiers, and to help all your brothers answer the question which science or rather its applications will never cease to ask. You can and should do this, in the light of the faith you bear within you. This is our dearest wish. We accompany your intention with a generous Apostolic Blessing.

1 Cf. AAS 28 (1936), pp. 423-424.

2 *In Multis Solaciis*, AAS 28 (1936), p. 421.

3 H. Denzinger and A. Schönmetzer, *Enchiridion symbolorum, definitionum et declarationum de rebus fidei et morum*; 34th ed. (Freiburg im Breisgau, 1967), nn. 3019, 1799.

4 *Gaudium et Spes*, 59, § 3.

5 *Ibid.*, 57, § 3.

6 *Ibid.*, § 5.

7 *Col* 1:16.

8 *Gn* 1:28.

9 *Jn* 1:9-10; *Gaudium et Spes*, 57, § 4.

10 Cf. *Rom* 1:20.

11 St. Augustine, *De Civ. Dei*, Bk. VIII, Ch. 4.

12 H. De Lubac, *Sur les chemins de Dieu* (Paris, Aubier, 1956), p. 84.

13 *Ibid.*

14 P.-H. Simon, *Questions aux savants* (Paris, Seuil, 1969), p. 41.

15 Cf. C. Tresmontant, *Comment se pose aujourd'hui le problème de l'existence de Dieu* (Paris, Seuil, 1966), p. 349.

16 Ch. de Moré-Pontgibaud, *Du fini à l'infini*. Introduction à l'étude de la connaissance de Dieu (Paris, Aubier, 1957), p. 65.

17 H. De Lubac, *op. cit.*, p. 78.

18 Card. Ch. Journet, *L'Eglise du Verbe incarné*, t. 3, Essai de théologie de l'histoire du salut (Paris, Desclée de Brouwer, 1969), p. 114.

19 *Gn* 1:21-31.

20 *Conf.*, Bk. XI, Ch. 4, 6; *PL* 32, 811. Cf. *In Ioannem tract.* 106, Ch. 17, n. 4; *PL* 35, 1910. Cf. *Ws* 13:1 and 9.

21 St. John of the Cross, *Spiritual Canticle*, verse 5.