



God the Only Commander and Legislator of the Universe

Address to the Plenary Session of the Academy



After dwelling on the creation of the universe and man, the Pope declares that true science 'never lowers or humiliates man'. Man's gift from God of the intellect allows him to engage in the scientific endeavour. Such investigation into the created world reveals the design of God, and the universe is a divine school of instruction. Referring to the Second World War, Pius XII adds that 'science can become a two-edged sword' bringing health or death. The 'blood-filled fields and seas' of that conflict are not what God wants of the use of science.

It is with great joy that we return to this hall of the Pontifical Academy of Sciences, amongst this distinguished gathering of Eminent Cardinals, illustrious diplomats and teachers of the highest repute. To be amongst you, Pontifical Academicians, worthy investigators of nature, of its many manifestations and of its history, who have been called together by our wise predecessor, Pius XI, to establish this important scientific institute. He had the wisest admiration for the progress of the physical sciences and the great depths which they are able to reach, greater in fact than the deepest crags which he was able to contemplate from the summits of the Alps. It is important to pay the greatest tribute to him which will only then render and amplify the honour paid to you, since he held you in the highest esteem and had a great appreciation of your academic worth. It was with the intention of rendering you honour that it was decided to grant you the title of 'Excellency', a title which is nothing but a recognition of the scientific excellency which you possess and which exalts you in the eyes of the world. The honour and the greeting which we give to you are first and foremost destined to your well-deserving and indefatigable President, but they extend also to those Academicians who have not been able to leave their countries and be present here due to the difficulties which we are all experiencing during this period. The joy which

we feel at being present amongst such a learned gathering goes some way to dispel the bitterness experienced as a result of this conflict between nations, all of whom are dear to us; our greater debt for such comfort is due to God, to whom we daily raise our trusting hopes; being wise and good, and by giving us His light, and granting us health and forgiveness, He steers all things towards that end where His infinite compassion triumphs over His justice.

Our Lord, Omniscient God, Creator of the Universe and Man

It is to Him that we must raise our thoughts and hearts even here in this hall of science; because it is the same God who sustains the universe, the passage of time, the good and bad experiences of nations and remains at the same time the all-knowing God; *Deus Scientiarum Dominus*.¹ His infinite wisdom makes Him Master of both sky and earth, of angels and men; in Him, creator of the universe, one finds hidden all the treasures of wisdom and science.² It is in Him that one finds the ineffable knowledge of Himself and the infinite imitability of His life and beauty; in Him one finds the knowledge of birth and rebirth, of grace and health; in Him are to be found the archetypes of the admirable dances of the plants around the sun, of the suns in their constellations, of the constellations in the labyrinth of the firmament right up to the last islands in the sea of the universe. He moved from the centre of the inaccessible light of his eternal throne so as to create both earth and sky and, alongside Him, was to be found the Divine Wisdom, delighting in the role of architect;³ He addressed the void from the threshold of eternity with the power of His voice; and the void was overwhelmed and conquered with the appearance of the sky and the earth accompanied with the thunder of that all-powerful voice. *Ex nihilo nihil fit* is applicable and true concerning everything from the hand of man to every living creature, but it cannot be applied with regards to the voice of God; *ipse dixit, et facta sunt*.⁴ And in the same way as both sky and earth were created, the earth began as a formless void and God's Spirit hovering over the water;⁵ so, too, was man fashioned out of dust from the soil and God breathed into his nostrils a breath of life and thus man became a living being.⁶ Such then is the *macrocosm*, the universe of worlds, before the *microcosm* which is man;⁷ little man, a minuscule world of spirit, surrounds and covers, like an arc filled with light, the immense empyrean of mass matter which is beneath man because of its lack of spirit.

God, Teacher of man

That day in which God formed man and crowned his head with His own image and likeness, making of him the ruler of all living things in the sea, in the sky and on earth,⁸ the Omniscient Lord God became his teacher. He taught him agriculture, to cultivate and look after the delightful garden in which he had been placed;⁹ He drew to man all the animals from the field and all the birds of the air to see what he would call them and so man gave names to all the cattle, all the birds, all the wild beasts;¹⁰ but, despite being in the midst of so many living things, man felt sad and lonely and attempted in vain to find a face which looked like him and which would contain a ray of that Divine Image which shines out of the eyes of every son of Adam. Only from man could there come another man who would then call him father and ancestor; and the helpmate given by God to the first man came from man himself and is flesh from his flesh, made into a woman and

called such because she came from man.¹¹ At the summit of the ladder of all that lives, man, endowed with a spiritual soul, was made by God to be a prince and sovereign over the animal kingdom. The multiple research, be it palaeontology or of biology and morphology, on the problems concerning the origins of man have not, as yet, ascertained anything with great clarity and certainty. We must leave it to the future to answer the question, if indeed science will one day be able, enlightened and guided by revelation, to give certain and definitive results concerning a topic of such importance.

Man's greatness

Do not marvel if, in front of you, you who have with so much acumen studied, researched, anatomised and compared man's brain with that of irrational animals, we exalt man whose face is bathed with that intelligence which is his exclusive inheritance. True science never lowers or humiliates man in his origins, rather it exalts and elevates him since it sees, compares and admires in each member of the human family the traces of the Divine Image.

Man is truly great. The progress made by him in the physical and natural sciences, in pure and applied mathematics, render him even more eager to secure greater and more certain advances. What is this progress if not the effect of the domination, even if limited and won at great experience, which he still exercises over inferior nature? And has the past ever witnessed a greater study, scrutiny and penetration of nature than the present? A constant research so as to understand nature's forces and forms so as to be able to dominate them, subdue them with his instruments and then utilise them for his own benefit.

Man is truly great, but he was of an even greater stature at his origin. If he fell from his original greatness by rebelling against his Creator and left, an exile, from the garden of Eden, in order that the sweat from his brow would drop on his bread, food from the earth amongst brambles and thistles;¹² if the sky and sun, cold and heat, shelters and forests, if countless other labours, discomforts of abode and conditions of life would humiliate his face and body; if the remains of that empire granted to him over the animals are nothing more than a faint reminder of his former power and a small fragment of his throne; it is still true that he remains great amongst his ruins because of that Divine image and likeness which he carries in his soul and because of which God continues to express His satisfaction in mankind, the last achievement of His creative hand. God did not cease to love nor to abandon fallen man and then, in order to raise him up once more, He himself 'as men are and being as all men are and knowing our weakness and temptations, He did away with sin'.¹³

Man, the investigator of the universe and his achievements

Two gifts which raise man high amongst the world of celestial spirits and the world of corporeal beings, render man great despite his fallen nature. Firstly his *intellect*, whose eye spans the created universe and crosses the skies, eager to contemplate God; secondly his *will*, endowed with a freedom to act and decide, servant and master of man's intellect, which, to differing degrees, allows him to become the master of his own thoughts and actions before himself, before others and before God. Are these not the two magnificent wings which allow you to ascend to the

firmament, O scanners of the skies, and which, throughout the night, keep you from sleep as you count the suns and stars, measure their movements, seek to discern their colours and discover their flights, meetings and collisions? You truly assume the stature of giants; with the broad vision of your telescopes you measure the number of the stars and you divide the spectrums, you pursue the vortices and the flashes of the nebulae and give them a name; but it is necessary for you to bow to Divine science, which is better able than you to fix the number of stars which exists and give each one its proper name, *numerat multitudinem stellarum, et omnibus eis nomina vocat*.¹⁴ The skies made of crystal have disappeared. The genius of Kepler and that of Newton were able to recognise in the sky the mechanical actions found on earth; in the flame and light of those revolving worlds you were able to discover elements to be found on our own globe; and by binding in marriage sky and earth you were able to extend the Empire of physics which was already rich in her pure and applied mathematical experiments, and in her genius, investigations and courageous acts and which had the effect of promoting nuclear and atomic physics.

From the infinitely big to the infinitely small

In the depths of the firmament you are able to discover, during your 'astronomical nights', those 'supergalaxies' or 'nebular groups or masses' which – as one of your distinguished colleagues pointed out – 'go to make up a most prodigious phenomenon which helps us to make certain observations whose immensity goes beyond all intellects and imaginations':¹⁵ colossal families, each one formed by millions of 'galaxies', each one in itself an immense astral system which has a diameter of many thousands of light years and holds within itself millions of suns. Many of you are eagerly awaiting the none too distant inauguration of the huge reflector which is five meters in diameter and which stands on Mount Palomar in California. With this instrument the sphere of the exploration of the universe will be able to expand to a thousand million light years.

But from this infinitely big realm of research you also descend to explore the infinitely small. Who could have been able to imagine, one hundred years or so ago, the nature of those enigmas which are trapped in those minute particles which we call chemical atoms whose width is in the order of a tenth of a millionth of a millimetre. At that time one considered the atom to be a homogenous globule. The latest physics sees it rather in terms of a microcosm in the real sense of the word, in which one finds hidden the most profound mysteries. Despite the most sophisticated experiments and the employment of the most modern mathematical instruments, current research still remains today at only the start of its conquests in the knowledge of the structure of the atom and of the elementary laws which regulate its energies and movements. So, at present, the continual mutation and transformation of all material things appears more than ever to be the case, even when concerning the chemical atom which, for a long time, has been considered to be unchangeable and imperishable. Only one being is immutable and eternal: God. *Ipsi (caeli) peribunt, tu autem permanes; et omnes sicut vestimentum veterascent. Et sicut opertorium mutabis eos, et mutabuntur; tu autem idem ipse es, et anni tui non deficient*.¹⁶ 'The heavens ... pass away but You remain; they all wear out like a garment, like outworn clothes You change them; but You never alter, and Your years never end'.

In such a manner you seek, in the immense fields of experience, laws concerning matter and

phenomena which create the unity, variety and the beauty of the universe.

The order of the universe revealing God's hand at work

Is the universe perhaps dumb when she presents herself to you? Does she not have something to tell you so as to satisfy the powerful inclinations of your intellects for a grand synthesis of the sciences? For a synthesis which is in accord with the order of the universe? The most important matter concerning the universe is the order which it manifests and which, in its entirety, both distinguishes and unifies it, runs right through it and links it in her various parts and natures which love and hate each other, repel and embrace one another, flee and then seek one another, combine and then separate from one another, and then conspire to steal the flash of lightning, the thunder and the clouds from the sky. During these very difficult times we are experiencing with a feeling of terror precisely such disturbances of the earth, sky and sea. It remains a thing to be wondered at that you know how each of these natures and elements in both organic and inorganic chemistry operates according to a different instinct owing to its own inclination and depends upon a principle without being conscious of the fact and conspires to achieve a particular goal without wanting necessarily to do so; in like manner the corporeal world, though it lacks a soul to inform and unify it, and also lacking understanding to govern and guide it, yet it is moved by reason as though it were something living and acts in a meaningful way as if this were its aim. Is this not the most evident demonstration of the fact that the world contains within itself the guiding hand of that invisible teacher which manifests itself in His work, He Who is the omniscient God, the God who orders the world with the greatest perfection?¹⁷ You search for the truth and the laws that sustain the synthesis of nature and creation, and of these laws you seek the reasons for them, rapt in wonder and lost for words before the movements of nature; in your hands and in your chains she tosses and turns and, at times, menaces you with an indomitable force which does not have its origin in you.

Neither the genius, nor the will, nor the action of man, with his many machines and implements, can disturb the order in nature; he can reveal it, as indeed doctors and surgeons continually do with the use of a scalpel which reveals the heart and the brain, muscles and veins; the most intimate secrets of the human body are discovered, the ways of life and those of death, so as to help life to repel death. Let us, illustrious Academicians, lift our thoughts to the Master of the sciences; a Teacher not of a knowledge learned from somebody else but belonging properly to Him, creator of the very same matter which He puts before man so that his genius may contemplate and study it. Is there perhaps a contradiction between the investigation of physical nature and the human intellect? Between science and philosophy? There certainly exists a tension between those sciences which do not recognise the hand of God at work in nature and that philosophy which sees in the laws of this nature a manifestation of Divine reason which takes care of all and governs the universe. Does philosophy seek to be an ideal dream which confuses God and nature, which gazes longingly upon visions and illusions of idols drawn from the imagination? Is not philosophy rather the very discipline which keeps us firmly rooted in the reality of the things that we see and touch, and the search for the deepest and highest causes of nature and of the universe? Does not all our knowledge stem from our senses? Where do laws come from? Let us

for a moment consider our life in society: do not all domestic servants working for one head of the family have a certain hierarchy amongst themselves while still remaining directly responsible to him? And the head of the family and all the other citizens, do they not also maintain a certain order amongst themselves and are they not also directly responsible to the head of the city; he then, in turn, and alongside other heads of the cities in a country, is responsible to the king or to the head of the state. The universe – as was already judged by Aristotle when recalling the thoughts of Homer¹⁸ – does not wish to be ruled arbitrarily. A great number of different people all issuing different commands is not a good thing; there should only be one commander; οὐκ ἀγαθὸν πολυκοιρανίῃ εἰς κοίρανος ἔστω, εἷς βασιλεὺς.¹⁹

God the only commander and legislator of the universe. The order to be found in the multiplicity and in the diversity of created things

God is the unique commander and legislator of the universe. He is a Sun diffusing and multiplying the rays of His infinite light into all of creation; but no single image in creation can equal His. Similarly, when a man finds it difficult adequately to express a concept in his mind he solves the problem by using many words. So, in the multiplicity of creatures and in their very many natures one finds the different remains of the one divine image, differing in quality to the degree to which they are able to draw near to God. You who carefully study the nature of things, have you not perhaps found that their difference is one of gradations? From the geological strata, that of minerals and inanimate bodies you then move on to plants and from plants to irrational creatures and, finally, from irrational animals to man. Does not the very fact of such diversity dictate a certain inequality between things and that all should be graded in an ascending order? In this order and in these grades we see nature and her different forms brought forward according to their perfections and strengths. They are ordered according to their actions and their purposes, their reactions and their compositions, their substance and quality. From these we find their properties, their differing agents with their concomitant impressions and differing effects; they differ because God has made them such, determined and steered towards a particular goal and a particular action.²⁰ In this inherent necessity of things, which is nothing other than part of the Divine Plan to bring all things to particular end, in the same manner as an archer might direct his arrow to the appropriate goal, in this necessity lies the law of the nature of physical bodies, a law which is part of their very nature.²¹ In the same way as a man may imprint a certain manner of acting onto another man through the issue of a command, so too does God imprint all of nature with the principle of her actions;²² and for this reason the Whole Made Universe, God and Master of Science, the university of all things *praeceptum posuit et non praeteribit*.²³ So that – in accordance with the teaching of the great Doctor of the Church, Thomas Aquinas – when someone asks the reasons for a particular natural effect, we are able to offer the explanation that the cause was due to the natural property of the thing even though all is brought back ultimately to the will of God as first cause, wise teacher of all of nature. So if a person is asked for the reason explaining why fire gives off heat and answers that this is because it is part of God's will, he would in fact be answering correctly if he wished to discuss the issue in terms of first cause, he would, however, have answered badly if he intended to exclude all the intervening causes.²⁴

All men are brothers attending the same Divine school

As God's creatures, the first cause also imprinted a sacred law within us, a sublime instinct, particular to man, which enables us to gain an immediate knowledge of God; desire 'which is a spiritual movement, and never rests until the object of its love makes it rejoice'.²⁵ If our flesh comes from the dust of the earth and is destined to return to it, then our spirit is immortal and, coming from God, it attempts once more to climb to God on the ladder of science but never actually managing to satiate its thirst for truth. The world is the Divine school, teacher of every science; when this school passes away we shall all remain face to face before God the Teacher. Let us then bow down before His wisdom since we can never overcome all the obstacles to a full knowledge of His wisdom; let us bow because of His great gift of this vast school-room which is filled with marvels and surrounded by even greater and immeasurable wonders; which were seen to be good once God had created them.²⁶ You yourselves have no doubts about it; you who have a better appreciation of the vastness of creation, the way and degree of perfection, the diversity and the beauty of the vast number of individual grades and the way in which their different weights determine their appropriate functions and operations; you who both love and magisterially promote the world of sciences. Is not also your science a brilliant reflection of divine science which one glimpses, at times clearly and at times obscurely, in the centre of things as they are in themselves? And yet, in the hands of men, science can become a two edged sword which can either bring health or death. Cast a glance at the blood-filled fields and seas and then ask yourselves whether it was for this that our provident and omniscient God made in His own image, redeemed him from his guilt and gave him new life with many graces from heaven; ask yourselves if God created such a developed intellect and warm heart so that man could then treat his brother as an enemy.

In the Divine school we are all brothers; brothers in our contemplation, in our study and employment of nature; brothers in life and in death; we pray before the crib of Our Lord, an infant who continues to love in silence, observes and then judges mankind which is tearing itself apart, that all men become brothers once more in love and in the victory of good in justice and peace over evil.

1 1 Reg., 2:3.

2 Cf. Col 2:3.

3 Pr 8:30.

4 Ps 32:9.

5 Gn 1:1-2.

6 Ibid. 2:7.

7 S. Th., I, 91, 1.

8 Gn 1:26.

9 Ibid. 2:15.

10 Ibid. 2:19-20.

11 Ibid. 2:23.

12 *Ibid.* 3:18-19.

13 *Ph* 2:7; *Heb* 4:15.

14 *Ps* 146:4.

15 G. Armellini, *Trattato di Astronomia Siderale*, vol. III (Bologna 1936), p. 318.

16 *Ps* 101:27-28.

17 Cf. Bartoli, *Delle Grandezze di Cristo*, Ch. 2.

18 *The Iliad*, 2:204.

19 Aristotle, *Met.*, XII, 11, 1076 a 3.

20 Cf. *Contra Gentiles*, Bk. III, Ch. 97.

21 *S. Th.*, I, 103, 1 ad 3.

22 *S. Th.*, I-II, 93, 5.

23 *Ps* 148:6.

24 Cf. *Contra Gentiles*, Bk. III, Ch. 97.

25 *Purgatorio*, Canto XVIII, 32-33.

26 *Gn* 1:31.