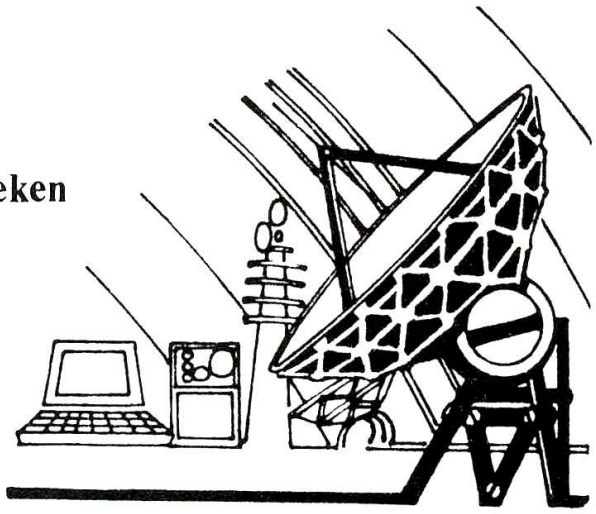
Faith and Science:

Possibility for a NEW DIALOGUE

by Jan Van der Veken



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The relationship between science and theology[1] has been a predominant topic on the cultural scene for the last three centuries. The ever-increasing gap between a scientific outlook at reality and traditional culture in the developing countries is a new instance of this age-old conflict. It seems as if we live in two different worlds: the world of science -- with its ever-increasing technological successes and dangers -- and the world of religious faith, which has deep roots in tradition.

Theology, as religious faith in search of understanding, has to reflect upon this relationship. In these pages, I would like to show that in the past the distance between science and religion has often been

too short. As a reaction against the resulting conflict, the distance during the last decades has often been too wide, that is, science and religion have been considered as so totally different that a conflict in principle could not exist. This can be called "the majority point of view." Many, still today, find that religion and science should not come too close to one another. They do not understand sufficiently that "even the Church" today talks in a different way about science than she used to do in the past.

Recent developments, both in science and religion, point toward an overcoming of this dichotomy. A new dialogue is possible, and is required for the survival of mankind and planet earth. Our situation in the cosmos, our responsibility for the future generation, and even for the endurance of life on earth, will probably appear as a main theme in theology for the following decades. Science has given man such a power over nature that for the very first time in the history of the world we are able to destroy the conditions of possibility of all life on our planet. We rightly can ask the question whether this planet is really "ours," and what the first point of the creed -- "I believe in God the Creator of heaven and earth" -- has to tell us about our responsibility for creation.

This does not mean that religious faith wants to stop or dominate scientific progress. This would be impossible, and it would be a disaster for a world craving for justice and freedom. But justice and liberation have a worldly dimension. To feed the hungry and to build houses for the homeless have ecological implications.

What we present here is a contemporary reflection on the relationship between a scientific and a religious outlook on reality. It would be a pity if the developing countries, discovering the promises scientific developments offer, would think that this has to result in a conflict with a religious understanding of reality.

(1) *DISTANCE TOO SHORT*

In the past, conflict between science and religion did not exist. In the Middle Ages (since the time of Saint Bonaventure), the metaphor of "two books" was very common: the "will of God" can be read in the Book of Nature and also in the Book of Scripture. Because God is the author of both the Book of Nature and the Book of Scripture, a conflict or contradiction is, in principle, excluded.

The so-called "warfare between science and theology" (which, in

fact, is a myth introduced by the 19th century author Andrew D. White. (See History of the Warfare of Science with Theology. New York, D. Appleton & Co., 1896) is a rather recent phenomenon. The founders of modern science, for example, Galileo and Newton, were believing Christians. In the case of Galileo, the conflict was, strictly speaking, not a conflict between science and religion.

Rather, it was a controversy about "How to read the Bible." Galileo was basically correct when he claimed science was only concerned with "how the heavens go," and not with "how to go to heaven" (a felicitous expression he borrowed from his friend Baronius).[2]

For Newton, it was clear that the laws of nature were the result of a divine choice; and Newton wrote to his friend that nothing would please him more than that his scientific studies would contribute to the greater glory of God and would strengthen the faith of the people.[3]

In fact, Newton needed even divine intervention to adjust from time to time the trajectory of the planets, and to prevent the planets from collapsing upon one another. Because an insufficient distinction was made between science and religion, the two ways of reading the will of God in the "two books" were often confused. When there was a conflict, it arose out of confusion.

(2) *DISTANCE TOO GREAT*

As an answer to the unhappy struggle between science and religion, and, as a way out of the confusion (Galileo and Darwin are the two most important cases in point), the more-educated Christians and scientists called a truce, that is, they came to accept that science and religion are two very different approaches to reality, with the result that a conflict in principle is impossible.

But the reason given for the non-conflict is different. Now it is no longer argued that God is the author of both the Book of Nature and the Book of Scripture. Rather, it is claimed that the world of nature and the world of the Bible are two different "worlds." Hence, this view can be called the "Two-world view." A modern way of expressing the same idea can be labelled "The two-language model."

This view of the relationship of science and religion is widespread today among educated Christians and in our universities. This "majority standpoint" has many advantages and it does seem to solve the

problem once and for all.

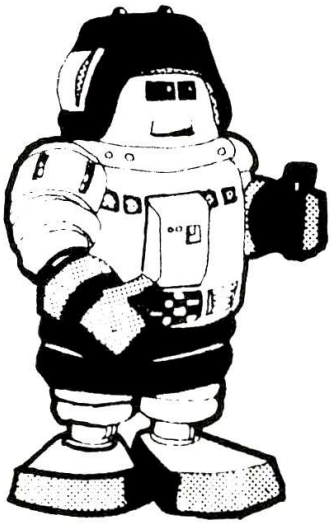
Still, it seems to us that this solution is somehow too easy. The distance between science and religion is now too great. For many reasons -- not in the least for theological reasons -- this standpoint seems to us untenable. It is, according to our interpretation, another instance of the unhappy divorce between "the humanities" and the technological world dominated by positive science.

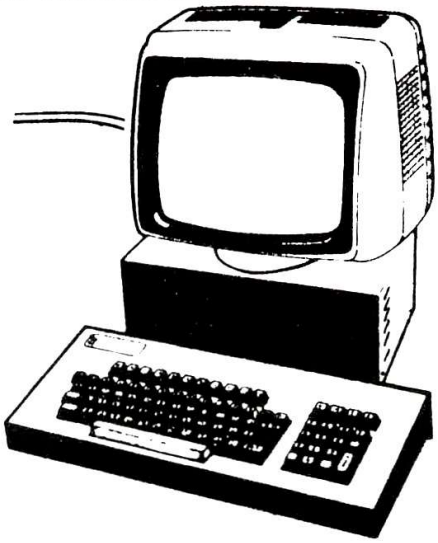
(3) IN SEARCH FOR A NEW DIALOGUE

a). Let us first turn to the theological reasons. If God is the Creator of heaven and earth, then theology, which has to be a logos about God, cannot be fully a-cosmic. Here the arguments from tradition abound. The Church Fathers have often given full attention to the cosmic dimension of salvation. The most important text quoted in regard to this matter is the passage from Romans (Rom. 8, 19), about creation groaning for its liberation. In its prayer and liturgy, the Church has always honoured the cosmic dimension. "Heaven and earth are full of your glory," we read in the Psalms and God is asked to give the fruits of the earth to his faithful.

Theology, as a reflection upon religious faith, cannot really escape the issues of cosmology. There seems to be a growing interest again in theology because of the issues raised by science. The "inroad"

Has technology something to say to believers?





is threefold, meeting points of faith and science occur in the realm of ethics, in the realm of epistemology, and, most importantly, in the realm of metaphysics.

In 1979, the World Council of Churches meeting in Boston, Massachusetts, discussed Faith, Science and the Future.[4] Clearly, here new accents were heard. Theology was urged to pay attention to issues raised by science. The "two world model" was no longer generally accepted. It became clear that the issues raised by science, and above all by the new possibilities of technology, claim to involve "more than science." It is exactly the role of what broadly can be called "The humanities" to present those principles of moral guidance, which will decide what we ultimately will do with the new and immense possibilities of changing, or destroying, the world.

The first way that science and religion, in our time, enter into dialogue -- after having gone their own way for some decades -- is in the realm of ethics. In ethics, science itself is no judge, and often even a bad counselor. The parable about The Eating Habits of Science, told by Rubem Alves at the Boston conference, makes that abundantly clear.[5]

b). The second way of establishing a meeting point between science and religion is by epistemology and through a philosophy of language. Recent investigations into epistemology and "language" of science have led to a general acceptance that science is not just a matter of "facts and nothing else than facts." Science is highly theoretical. It is an interpretative scheme. It is a way of "seeing" a whole range of data (posita) as holding together and interpretable in a coherent way. Wittgenstein has made it clear that seeing is always seeing as it is, seeing reality as one thing rather than as another (the "duck-rabbit" figure).[6]

This applies also to our scientific outlook at reality. Interpretative schemes may change; they are subject to choice and preference, and even fashion. The development of science is in no way as "rational" as early positivists wanted to believe it to be. Here, the studies of Thomas Kuhn and Paul Feyerabend are highly instructive.

These studies led to an unexpected conclusion: science implies a moment of choice and preference; a way of "seeing" reality as one thing rather than as another. It follows, then, that the epistemology of religion -- which also uses interpretative schemes and highly interpretative

language -- is not entirely different from the language of science.

Of course, there are important differences that should not be overlooked. In religion, verification seems to be far more difficult. The witness of the heart cannot be submitted to an analysis in the laboratory. Theological interpretative schemes encounter far less "resistance" than scientific theories. If we ask the wrong questions, we are confronted with what Merleau-Ponty has called "un desaveu des choses,"[7] (a disavowal or disapproval from the side of reality itself).

But the time has passed when one could consider science as wholly and uniquely "rational," and religion as primitive and infantile. (Recall the "Law of the Three Stages" of the early positivist, Auguste Comte.)

c). A third meeting-point between science and religion is truly metaphysical. Science implies a certain view on reality as a whole. Science has presuppositions for which science itself cannot account.

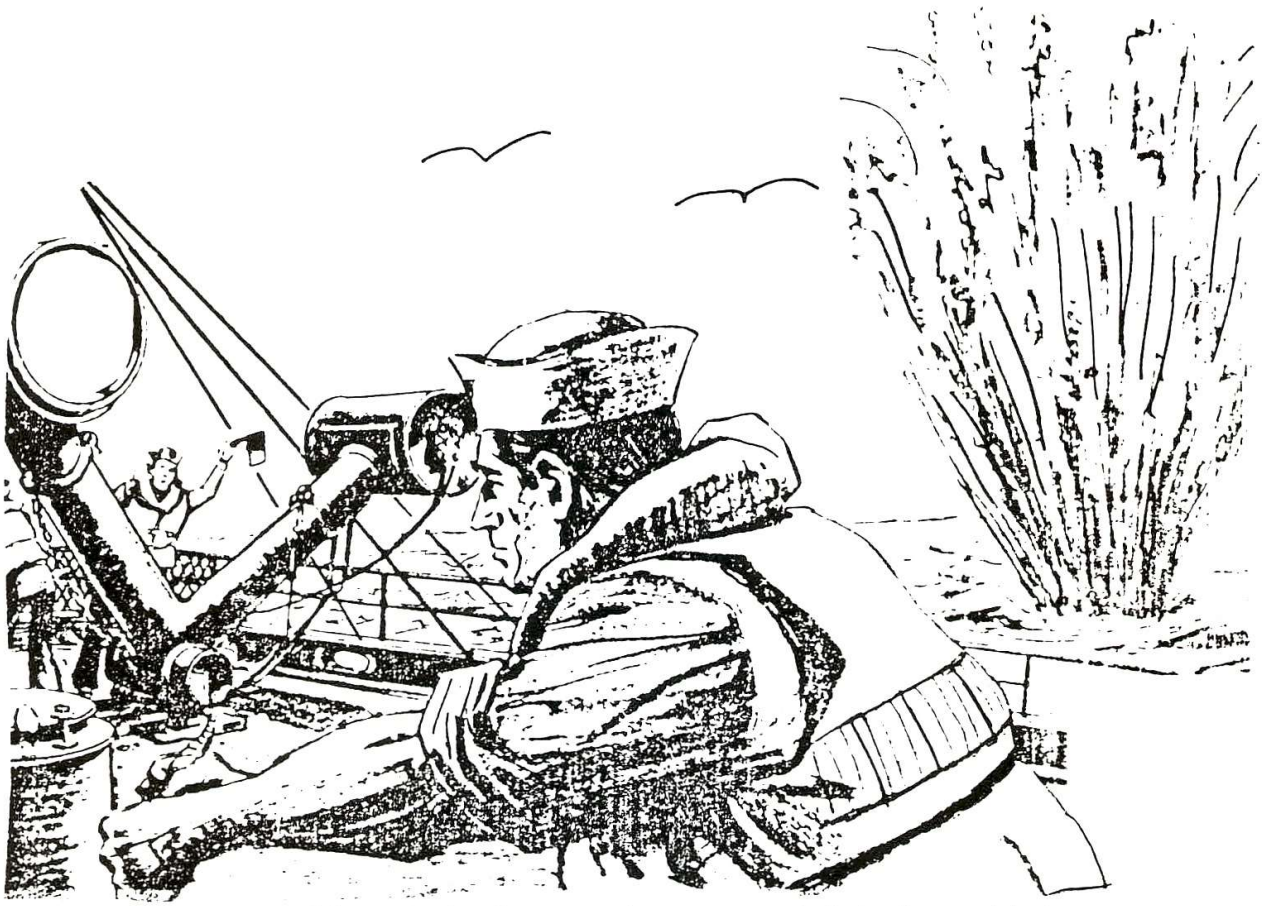
There is the overall belief that the universe is truly rational and can be understood even by our limited human minds. (We have shown elsewhere[8] why Kant's ingenious solution of this problem is no longer viable after what can be called the fragmentation or historicization of transcendental subjectivity.)

If our conceptual schemes were not adjusted to reality, our rockets would not reach the moon, and Pioneer would not be able to leave our solar system. Science is based on the acceptance or the belief that the same rules or laws apply everywhere. This, of course, cannot be proven. But without that assumption, science could not proceed.

It is the task of philosophy to speculate about the rationality of the Universe, and even about the rationality of Reality as a whole.

We normally ask the question: How could cosmic evolution bring forward living beings and man? But we can also ask the opposite question: What can be said about the Universe or about Reality as a whole on the basis of the fact that there is, at least somewhere, some place in the universe, a thinking being, capable of developing a conscious and successful grasp upon the environment in which that being lives? This principle has been called "the anthropic principle."[9]

It is impressive how much about the universe can be derived from the very fact that a being capable of reflective thinking exists. The



Without ethics, technology can be very armful to human kind.

conditions of possibility of intelligent life in the cosmos seem to be very narrow. "Narrow" here means complex, or rich, or demanding. A source of energy is needed (as our sun) which exists long enough to allow its satellites or planets to cool down and to develop an atmosphere. The planet itself has to be close enough to the sun to draw solar energy from it, and far enough away to be protected against the all-devastating cosmic rays of its energy source. A planet, for example, 10 percent closer to the sun, or 10 percent farther away, would not be a possible bearer of intelligent life, because not enough time could be allowed for evolution.

A "golden rule" for all metaphysical thinking is: Reality as a whole must be such that concrete realities are possible. Among those finite, empirical realities, the very presence of reflective human consciousness teaches us much about Reality as a whole. What we really need is an overall view of Reality, which shows that man is at the same time unique (we are not aware of the existence of E.T.'s or other visitors from star worlds) and that man truly belongs to the universe -- man is

a child of the universe.

Again, in this matter, important developments are taking place. Whereas traditional or classical science created an unbridgeable gap between man and nature, to the extent that man was completely divorced from nature, recent developments in science seem to show that there is, at the same time, continuity and newness with regard to the place of man in the universe and in the stream of emergent evolution.

d). The fact that both science and theology went through a metamorphosis opens, according to our understanding, the most promising perspective for a new dialogue.

As far as theology is concerned, contemporary theology is far more dynamic than more-traditional theology based on the so-called "philosophia perennis." This "philosophia perennis," in fact, bears in itself the Greek prejudice in favour of immutability, and against becoming. Educated theologians today have generally accepted a dynamic world-view, combined with an evolutionary perspective (although the latter more hesitantly than the former). In any case, from a theological point of view, creation should not be conceived as a once-and-for-all thing. God is really "with all creation," not just in the beginning or "before all creation."

It may also be argued that the dynamic world-view, which comes to us so naturally today, has been introduced into our culture by Judeo-Christianity and is truly biblical. The God of the Bible is first of all the Lord of history. He is really travelling with his people.

It is strange that Christianity, as a whole, has had such difficulties with the world-view of evolutionism, which became part of our self-understanding at least since the 19th century. The reason is that evolutionary theories have often been undergirded by materialistic philosophy. It seemed as if there was no alternative -- either the creation story, or "the descent of man from the ape." Today we see that the early forms of evolutionary theory were, it must be said, too simplistic (stressing, for example, only the struggle for life as the explanatory mechanism of the whole process of evolution). But as a whole, evolution has made its entrée once and for all into the educated world.

Because the dynamic world-view has, in principle, been accepted, there have been far-less difficulties with the assimilation of the 20th century cosmological theories about the origin of this universe. The "big-bang theory," for example, is not advanced generally as an alternative for creation, because it became clear that we are here confronted with two quite different interpretative schemes.

We contend that such a dynamic theology is far better equipped to enter into dialogue with modern science than the either-or world-views of the past.

On the other hand, and this is even more important for the possibility of a new dialogue, in science itself important developments are taking place at present. Science also has undergone a metamorphosis. Here I refer to the book of Ilya Prigogine[10] and Isabelle Stengers, La Nouvelle Alliance, Metamorphose de la science (Paris, Gallimard, 1979). This book has been translated into English under the title Order out of chaos (to be printed soon), but the French title is even more instructive, and is titled purposely.

This book describes scientific developments which have taken place during the last one hundred years. The authors have chosen the image of a "metamorphosis." One should not have the impression that contemporary science is wholly different from science in the past. But the developments are important enough to distance us from what should be called from now on: classical science ("La science classique" meaning -- science as it was conceived by the great founders Galileo and Newton, and of which Bacon and Laplace were, among others, the theoreticians).

1. The prototype of classical science is mechanics. Indeed, the results of the two new sciences (mechanics and dynamics, according to Galileo's Discorsi e dimostrazioni matematiche, 1638, are so impressive that the mechanistic model has imposed itself. Science of the 18th and 19th centuries is truly mechanistic. The whole universe is conceived of as an enormous machine. Prediction is, in principle, possible. An all-powerful mind, knowing what is the case at this moment, and knowing also the inexorable laws of nature, could predict, in principle, what will happen at every moment of time. This is Laplace's famous example.

This all-powerful mind has often been equated with the mind of God. The image of the all-powerful mind may, indeed, be interpreted in a "theistic" or a "scientific" way. In both cases, the results are the same. According to this view, everything is settled by its antecedents. Nothing really new happens. Determinism and predictability are the underlying presuppositions of the classical world-view.

This classical view of science is still prevalent, and is successful as a first approach. For all practical purposes, and on a macrocosmic scale, the rule -- "the same causes have the same effects" -- works. But gradually, this world-view, governed by determinism and iron law has proved inadequate to understand the finer elements of nature.

The inner structure of matter, and above all the coming into being of real novelty, cannot be understood, if the same causes endlessly produce the same effects.

On the microscopic level, strict determinism seems no longer tenable (although different interpretations of Heisenberg's principle of indeterminacy are still possible). Since the time of Heisenberg and Born, scientific laws are considered to be statistical laws. This premise is widely-accepted, even today.

The fact that strict efficient causality has also to be surpassed may change our image of nature even more profoundly. Thermo-dynamics is the domain where strict reversibility is no longer tenable. A candle can burn, but can never return to its initial state. Still, reversibility was one of the most cherished dogmas of classical science.

The typical example of classical mechanics is the pendulum. The trajectory from point A to point B is exactly the same as that trajectory from point B to point A, with a "little" correction, that is, a bit of energy has been lost by the heat, resulting from friction at the axle. But classical science was not troubled by that minute detail. It worked with the model of the ideal pendulum. Classical science is idealized science. It does not reflect the real world -- the world in which new and unexpected things happen.

Thermo-dynamics is the first non-classical science. Fourier has been an innovator by formulating a mathematical law governing the propagation of heat. It is a description, in mathematical language, of an event that classical science could not truly understand: the propagation of heat is an irreversible phenomenon.

Ilya Prigogine obtained the Nobel-Prize in chemistry for his study of this irreversible phenomena, which he called "dissipative structures." Dissipative structures are, in principle, irreversible phenomena.

Dissipation and structure seem to exclude one another. Still, there are phenomena which occur in given circumstances (away from the state of equilibrium) where new structures come into being, out of lower levels of organization. These phenomena are also irreversible; something really new has happened. (An example given by Prigogine is the so-called "instability of Benard".)

These phenomena are most probably at work everywhere. They are

certainly at work in the origin and evolution of life. Life itself, even in its very primitive forms, is a phenomenon of order, which interacts with less-ordered structures. It maintains its own equilibrium.

In the classical deterministic view of science, the emergence of life in this universe is very hard to understand. In a deterministic universe, which is endlessly repetitive, non-life is far more probable than life. Jacques Monod,[11] also a Nobel-Prize winner and in many respects a proponent of "classical science," comes to this conclusion: life is the most improbable thing that could happen. Not evolution, but non-evolution is the rule. Invariant reproduction is the most important distinctive feature of living beings. If there is evolution -- and Monod will not deny the fact of evolution -- it cannot be other than the result of chance. There is nothing in the universe which accounts for the probability of life, let alone for its higher forms, such as consciousness.

Monod states it explicitly: His view of classical science imposes upon him the breakdown of the "ancient alliance" between man and the cosmos. The view that man is somehow expected in the cosmos, or that the world is made for man, is for Monod a form of animism. Monod is as opposed to creationism as he is to dialectical materialism. In all these views, he sees some justification for the being of man. He holds that somehow man wants to believe that there is a reason for his presence in the universe. Those who believe in God, or those who believe in the hidden possibilities of matter, agree at least on one point: man is not just a matter of chance. Teilhard de Chardin, a Jesuit priest, favors dialectical materialism. For de Chardin, and for dialectical materialists, there is a reason for man's being there.

The contrary is true, says Monod. And for that reason, he is as much opposed to Teilhard de Chardin as he is to dialectical materialism. Monod's scientific world-view brings this conclusion: "the ancient alliance has been broken down." We know now that we are alone in a cosmos which has not willed us, and in which there is no room for us.

Starting from the mechanistic and deterministic presuppositions of classical science, this conclusion seems unavoidable. Indeed, in such a universe, nothing really new and unforeseen could happen.

But Monod's conclusion may show that the presuppositions of classical science may not be tenable all together.

In fact, nature is rich in possibilities, and, if new more-complex

structures emerge (in ways which are not foreseeable at present), then the amazing fact of the emergence of life is more probable than improbable. Given the right circumstances, and given the presence of "dissipative structures" (to use his expression as a general name for very complex happenings which are certainly operative in the emergence of life, but which are still largely unknown as far as the details are concerned), a phenomenon such as life is, to use Prigogine's image, as "natural" as the falling down of a stone.

We have said already that thermo-dynamics is the first non-classical science. It has introduced "the arrow of time" into physics. The thermo-dynamics of life makes it clear that a view of science, which cannot account for real newness, is not a viable option any more.

2. A second and more important shift in our world-view is the emergence of a new insight into the relationship between mind and matter. Here we are tackling a philosophical rather than a scientific issue. But it is our conviction that developments in science itself make the "two-substance view" less and less probable. By "two-substance view" is meant the propositions of Descartes. On the one hand, there is consciousness -- the "cogito" -- and on the other hand, there is matter -- mere extended reality (res extensa; partes extra partes). Consciousness or spirit is a substance completely different from matter. It is fully present to itself, and can exist in itself. Matter, on the other hand, is, for Descartes, dead stuff; nothing else than a machine. Descartes describes the human body also as a machine, and in so doing, he has probably made possible a new attitude towards the body, which could be considered as merely objective and not really human. In his own way, Descartes has canonized the "two-substance view." He has certainly encouraged and undergirded the mechanistic world-view of early science.

Descartes' "two-substance view" is very different from the Aristotelian-Thomistic view. According to Aristotle and Saint Thomas Aquinas, the soul was not a substance, but a principle, intrinsically related to matter, which is also conceived, not as dead stuff, but as a principle of determinateness (hylomorphism).

The insights we have in the close interaction between the self and its brain, make the world-view of Descartes rather improbable. Mind and matter should not be conceived as unrelated substances. Nor should mind be reduced to nothing else than a mechanical function of the brain. Here the work of Sir John Eccles is very instructive. He recognizes that the mind is not the same as the brain. One has the impression that the relationship between the mind and the brain is compa-

rable to the relationship that exists between the reader and the text. The text contains the information, but, without the reader, it is completely inert and meaningless.

There seems to be a growing tendency to what I would like to call a "bi-facial view on reality." I find hints in that direction can be found in different authors, such as Teilhard de Chardin, Whitehead and the later Merleau-Ponty.

The real has, so to say, two faces: the material or objective side is what a given reality is to its environment, to the other. Its objective side is the way it is experienced by the other, as a given.

On the other hand, a reality has also some inner core. It puts itself together. A plant, for example, is a structured whole, which somehow integrates its parts, and is related to its environment with which it interacts as a whole. Let us call this aspect "the inner side" of a being.

As human beings, we experience ourselves in a reflective way. And as far as we know, this type of reflective consciousness is unique in our cosmos. But it does not follow that other beings are totally different from us and entirely void of mentality, and that they are mere inert machines.

In fact, a world-view which is closer to Leibniz than to Descartes becomes increasingly probable. Leibniz conceived the whole of reality as constituted out of myriads and myriads of monads. They are centers of force: "everything in it is forces, life, soul, thinking and striving."

3. That we live in a dynamic, developing world of incredible magnitude is a mystery that baffles the mind. It is not true that science has taken away the sense of mystery. The contrary seems to be the case. Science today is a great distance from the positivistic claim that it can explain everything. Science has become humble.

With such a science, the dialogue is easier. Religion also originates in wonder. Science, in its own way, can lead us to the recognition that we are confronted with a universe, rather to be conceived as a work of art than as a huge machine.

Both science and religion are confronted with what Heisenberg calls "the central order."[12] Science has to accept the intelligibility of the universe. The most undeniable way in which this order confronts

us is the stability of the laws of nature. Science presupposes those laws, but cannot account for them.

Here we reach the meeting-point between science, philosophy and religion.

Science tells us how all the events that constitute the visible world interact and influence one another. Philosophy leads us to a view of the totality of reality, which is conceived as a dynamic, inter-related whole.

Religion says more about the "central order" than science, and

How do believers see the technological world? Can they perceive more than others?

more than philosophy. According to Ian T. Ramsay, religion originates out of the disclosure of the Universe and its more. In other texts, the "more" is the more than the visible. The Universe, then, contains the visible and its more. I would like to paraphraze Ramsey's expression, borrowing an expression from the Dutch language which, in translation is: to believe is to see more in it.

Religion says more than science about the mystery of all things.

The word "God" functions as an "integrator" word. It "integrates" several meanings (all-encompassive reality, creative advance into novelty; order; harmony; ethical claims; care; personal relationships; Thou!).

Some, not all, of those meanings are also detectable by science (for example, the inter-relatedness of concrete realities; the intelligibility of the universe; the permanency of the laws of nature).

Religion contains an interpretative element which is more related to the totality of the human person, and is for that reason, more impregnated by historical and cultural elements than science. Religion is closer to the heart than is science. Religion is less objective. Science is more universal and more objective. Religion says more than science about the Mystery which supports us in existence. And religion does not enter into conflict with science.

CONCLUSION

1. It will suffice, by way of conclusion, to suggest that developments within science and within theology allow for a new and fruitful dialogue. A dialogue begins from the presuppositions that those in the dialogue are not saying exactly the same thing, and that they do not reject one another's viewpoint in principle, that is, they do not belong to two entirely different worlds.

2. Our position is not that there is a special science for believers, and another science for non-believers, but that there is a conception or self-understanding of science which makes a dialogue with a religious world-view impossible (right from the beginning), and that there is another conception or self-understanding of science which does allow for dialogue. The concluding words on "Science and Faith" at the Boston Conference, in 1979, are as follows:

"We urge for extensive and careful theological and philosophical

analysis of this complex interrelation, an analysis which recognizes that science and faith share a deep sense of the mystery that underlies them both."

The future of planet earth will depend upon the success of this dialogue. The impact of science upon our environment and upon our future is incredible. However, science, left to itself, will not be enough to save us from the possibility of self-destruction by the use of the terrible forces built into nature, or by the premature exhaustion by over-cropping or other forms of exploitation.

An ethical will to cope with the possibilities and dangers of science is necessary, and it may very well be the case that this ethical will needs, in order to be effective, a total and religious outlook on reality. Only an attitude of worship, which is at the heart of religion, will bring us into life-giving contact with the Source of all being and becoming, and will show us our true nature: to be stewards in the garden of the Lord our God. But that, again, is neither philosophical nor scientific language.

FOOTNOTES:

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(2) Letter to the Grand Duchess Maria-Christina, in Galilée, aspects de sa vie et de son oeuvre (Paris, PUF, 1968), p. 339: "L'intention du Saint Esprit est de nous enseigner comment on va au ciel et non comment va le ciel."

(3) E.A. Burtt, The Metaphysical Foundation of Modern Science (Doubleday Anchor Book, 1954), p. 288, quoting from I. Newton, Opera, IV, pp. 429, ff., first letter to Doctor Bentley: "Sir. When I wrote my treatise about our system, I had an eye upon such principles as might work with considering men, for the belief of a Deity; and nothing can make me more joyful than to find it useful for that purpose. But, if I have done the public any service this way, it is due to nothing more

than industry and patient thought... The same power, whether natural or supernatural, which placed the sun in the centre of the six primary planets, also placed Saturn in the centre of the orbs of his five secondary planets; and put Jupiter in the centre of his four secondary planets; and the earth in the centre of the moon's orb; and, therefore, had this cause been a blind one, without contrivance or design, the sun would have been a body of the same kind with Saturn, Jupiter, and the earth; that is without light or heat. Why there is one body in our system qualified to give light and heat to all the rest, I know no reason, but because the author of the system thought it convenient."

(4) Faith, Science and the Future. Essays edited by Paul Albrecht (Philadelphia, Fortran Press, 1979). Faith and Science in an Unjust World. Report of the World Council of Churches' Conference on Faith, Science and the Future. Part I, ed. R. Shinn; Part II, ed. P. Albrecht (Geneva, World Council of Churches, 1980).

(5) On the Eating Habits of Science. A Response to Rubem Alves, in Faith and Science in an Unjust World, Vol. I., Plenary Presentations, pp. 41-43.

(6) Ludwig Wittgenstein, Philosophical Investigations (Oxford, Blackwell, 1953), Part II, IX, pp. 193-195.

(7) Maurice Merleau-Ponty in Le Visible et l'Invisible, suivi de notes de travail par Maurice Merleau-Ponty. Texte établi par Claude Lefort, accompagné d'un avertissement et d'une postface. (Paris, Gallimard, 1964), p. 262.

(8) J. Van der Veken, "De spanning tussen de geesteshouding van de gelovige en die van de wetenschapsbeoefenaar" in Betrekkingen tussen geloof en wetenschap. Twee verkenningen ('s Hertogenbosch, Radboudstichting Wetenschappelijk Onderwijsfonds, 1981), pp. 13-14.

In short: Kant's philosophy must be understood as an attempt to explain why a structured system derived from the mind can account for observational relations. With the discovery of a plurality of categorical systems, the situation changed completely. The basis for the description of physical reality can no longer be situated in the a priori structure of the human mind. Again, after Kant, the answer to the question, which system is suitable for the description of physical reality, must ultimately be left to empirical data. Cf. H. Reichenbach, "Philosophical Significance of Relativity" in Albert Einstein, Philosopher-Scientist. ed.

P. Schilpp (New York, Tudor, 1951), P. 302.

(9) Cf. a status quaestionis in George Gale, The Antrophic Principle, in Scientific American, Dec. 1981, pp. 114-122.

(10) Born in Moscow, 1917; emigrated to Belgium in 1921; professor at the Université Libre de Bruxelles; Nobel-Prize in Chemistry, 1977. See also "La thermodynamique de la vie," La Recherche, June, 1972, and From Being to Becoming: Time and Complexity in the Physical Sciences, San Francisco, Freeman, 1980.

(11) Jacques Monod, Le hasard et la nécessité. Essai sur la philosophie de la biologie moderne (Paris, Seuil, 1970).

(12) Werner Heisenberg, "Science and Religion" (1927) in Physics and Beyond. Encounters and Conversations, trans, Arnold J. Pomerans (New York, Evanston, London, Harper and Row), p. 89.