Stanley Jaki, Pierre Duhem, and the Birth of Science

On the so called conflict between science and the Catholic Church

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Title

Pierre Duhem and Stanley Jaki are about three generations apart. But their lives are significantly linked. In a sense, Father Jaki completed the work of Duhem as a historian of science. In the process, he wrote quite a number of books about Duhem, and even about the only daughter of Duhem, Hélène Duhem. Father Jaki also wrote quite a number of books about the history of science, and about the relation of science and religion. Both contributed to dissipate the (still very popular) idea that the Catholic Church was fighting the development of sciences.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Jaki/Colombo

About myself: I met Father Stanley Jaki in 1999, but I was aware of his works since 1987. We met because he had to give a talk in Milan (Italy) on a Monday, but arrived in Italy a couple of days before, on a Saturday. A program of visits had been prepared for him (including a visit to Leonardo's Last Supper), and I had the rather modest task of being his driver for that couple of days. He gave us a booklet, and I noticed a misprint in the booklet. To make a long story short, I started proofreading for Father Jaki from then on, translating his books into Italian, and I was one of the four people present when he died, in Madrid,in 2009.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Duhem

Here is a picture of Duhem, taken a couple of year before his death.

Pierre Duhem was a French physicist and historian of science. He was born in Paris, on June 9, 1861, and died in Cabrespine, a small village on the Pyrenees, exactly 100 years ago, on September 14, 1916. We are interested here more to the historian of science than to the scientist, but he also produced a lot of scientific papers, before the era of the atom. His interest was chemical physics. He was what we can define a Catholic traditionalist, and this determined also his scientific career. He should have been teaching in Paris, but he ended up teaching in Bordeaux, a place very far from Paris. He married in Paris on October 28, 1890 during his first assignment as a teacher, which was the Faculty of science in Lille, near the Belgian border. Duhem was a monarchic, and did not like the French Republic. He also was on the wrong side regarding the Dreyfus affair (he was in favor of the condemn of Dreyfus). This is one of the reasons for which, when he was at the university, collaborated with the illustrations to an anti darwinian (and anti-republican) publication, whose author was Étienne Récamier the father of his friend Joseph Récamier.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* France

On this map of France, the main places in which Duhem spent his life are outlined. Paris is where he was born and studied. He should have been teaching in Paris, but that did not happen. He was sent instead to Lille, in the North of France. There he met (and lost) his wife. Then he went to Rennes. After that he went in Bordeaux, with the idea that he would have been there only for a short time. That short time turned out to be his whole life. During summer he was used to stay in Cabrespine, in the family house, in the small place where his mother was born. There he ended up dying. One can easily notice that, in a way, he was kept at a safe distance from Paris by the Academic Authorities.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Life

This is a timeline of the life of Pierre Duhem

\* 1861 Born in Paris, 9 April

Father: Pierre-Joseph Duhem (from Roubaix, in the French Flanders)

Mother: Marie Fabre (born in Cabrespine, but her family from Paris)

Younger twin sisters: Born on December 1862 Marie & Antoinette (only Marie survived, Antoinette died on 25 November 1872).

Brother: Jean, Born on 30 September 1872, died on 15 November 1872

\* 1872 Stanislas College (Catholic)

\* 1882 École Normale (Scientific Section) rather than at the École Polytechnique

\* 1884 Thesis in physics rejected because contradicted Berthelot's Maximum work principle

\* 1887 Appointed Maitre des Conferences (Lecturer) at the University of Lille

\* 1888 Thesis in Mathematics on the Theory of Magnetism

\* 1890 October, gets married (in Paris) with Adele Chayet

\* 1891 Hélène Duhem born 29 September

\* 1892 Wife's death 28 July (hearth problems) (a second daughter lived a few hours)

Duhem's mother came to live with the son, up to her death (and raised Hélène). Duhem never considered marrying again.

\* 1893 Rennes

\* 1894 Bordeaux (est le chemin de Paris) (Monsieur Liard, directeur de l'enseignement superieur)

\* 1895 Professor of Theoretical Physics

\* 1900 Membre Correspondent of the Academy of Sciences of Paris

there were no members outside Paris before that. He was to first one.

\* 1916 Death in Cabrespine, 14 September

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Main Publications:

(a total of over 550 between essays and books),

\* 1883 Au pays des gorilles (satire against Darwinian materialism)

Directed against Darwininsm as a philosophy

\* 1886 Le potentiel thermodynamique et ses applications à la mécanique chimique, et aux phénomènes électriques.

Already accepted and published in an essay form in 1884, this book on the thesis rejected under Berthelot's influence

\* 1891 Hydrodynamique, Élasticité, Acoustique

\* 1891-1892 Leçons su l'électricité et le magnetisme (3 volumes)

\* 1893 Introduction à la mécanique chimique

\* 1903 L'évolution de la mécanique

\* 1906 La théorie physique: son object et sa structure

\* 1906-1909 Études sur Leonard de Vinci

\* 1908 Sozein ta phainomena (To Save the Phenomena)

\* 1911 Traite d'Energetique (2 Volumes)

His main work.

\* 1913-1959 Le système du monde: Histoire des doctrines cosmologiques de Platon a Copernic

\* 1915 La science allemande

Note the 1959, this is what involves Duhem's daughter Hélène. Only the firt 4 of 10 volumes were published while Duhem was still alive. Volume 5 appeared in 1917, the others between 1954 and 1959.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Duhem the scientist

Duhem's interests fell roughly into periods.

His work in thermodynamics and electromagnetism was predominantly in the period 1884-1900; he returned to the latter between 1913 and 1916.

His interest in the philosophy of science was mostly between 1893 and 1906, and the history of science primarily between 1904 and 1916, although his earliest papers date from 1895.

Finally he concentrated on hydrodynamics and elasticity between 1900 and 1906.

-- Donald G. Miller, Physics today, December 1966

Donald G. Miller is a physical chemist with a PhD from Illinois. He has been at the Lawrence Radiation Laboratory, Livermore, since 1956 working in thermodynamics of irreversible processes, electrolyte solutions and die history of science—primarily thermodynamics.

Donald G. Miller passed away on 3 February 2012 at the age of 84.

Sooo: Scientist, philosopher, historian of science. We will be considering mostly the historian of science.

Even if some of his favorite ideas have been eclipsed by the ascendance of atomic theories, his purely scientific investigations in thermodynamics, physical chemistry, hydrodynamics, and elasticity are important, useful and significant today.

Moreover many of his works, particularly in thermodynamics, are of considerable historical importance. In his rejected thesis he showed the great utility of the Gibbs and Massieu thermodynamic potentials in the analysis of practical problems. He was the principal expositor of Gibbs's ideas in France and perfected them in detail. He helped banish the erroneous maximum-work principle from science, and he gave or anticipated a number of important concepts of thermodynamics.

(For examples, we note the first precise definition of a reversible process, the differentiation between quasistatic and reversible processes, the first serious axiomatization of thermodynamics, the definition of heat in terms of work and energy 15 years before Caratheodory, the use of Euler's theorem for partial molal quantities, and a generalized phase rule including masses.) His work on quasi shock waves and systems like liquid crystals is also important.

-- Donald G. Miller, Physics today, December 1966

We note here that he is not involved in the discovery of the atom.

Electron was first theoretically postulated in 1874 by Stoney.

Joseph John Thomson got a Nobel prize for studying cathode rays, as conducting negative electricity in 1909.

Always in 1909 Hans Geiger, Ernest Rutherford and Ernest Marsden discovered the nucleus.

The first model of the atom was proposed by Bohr in 1913.

Duhem opposed the atom since during his life several conflicting theories were being held on the subject.

Duhem also opposed Maxwell, wrongly, as it turns out.

As a philosopher, Duhem was defined by Stanley Jaki as "a man of common sense, with a realist touch". Father Jaki in his books showed how realism is the better intellectual climate that favors scientific research. This is not the case with idealism.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Hélène Duhem, picture

Hélène Duhem was his only daughter (She was born in 1891 in Lille, and died in 1974 in Carcassonne (not far from Cabrespine, where she mostly lived)).

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Hélène Duhem Life

1891 Born in Lille, 29 September

1906 Death of her grandmother

1916 Death of her father

1933 Decides to devote his life to the memory of his father

1936 Un Savant Français: Pierre Duhem

1954-1959 Publication of the last five volumes of Le système du monde

1974 Dies in Carcassonne, 24 April

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Duhem the historian

Reverence for the historical record

Reliance on original sources (Latin and Greek)

Nothing between Aristotle and Leonardo / Galileo?

This was at the time the "normal" position regarding the origins of science.

The origins of such a position go back to the Enlightnment, which was violently anti-Catholic.

Duhem was aware of Leonardo, before Galileo, but not of anyone before him. Checking documents, he found out that Leonardo did not live in a vacuum, but was part of a stream. The subtitle of his books on Leonardo was "those whose works he read, and those who read his works"

Science does not happen in a vacuum:

«The science of mechanics and physics derives in an uniterrupted sequence of hardly visible improvements from doctrines professed in medieval school. The pretende intellectual revolutions were all too often but slow and long-prepared evolutions. The so-called renaissances were often but unjust and sterile reactions. Respect for tradition is an essential condition of sceintific progress.»

-- Pierre Duhem, Les origines de la statique, p. 2

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Aristotle in the West

Now, about science:

Works of Aristotle started to be translated from Arabic or from Greek, starting from the XI Century. A lot of commentaries were written about the works of Aristotle, including the De coelo and De Physica.

Aristotle, of course, was a Pagan, so some of his doctrines were in conflict with Christian doctrines, as contained in the Bible, or in the Patristic tradition. In 1277 the Archbishop of Paris condemned 219 statements taken from Aristotle. This, as Duhem found out, caused the reframing of Aristotle's ideas in accordance with the Catholic dogma of creation.

(Aristotle did not think there ever was a creation in time. For him the world was eternal. He believed that the succession of seasons in a year were a model for a "great year", in which all the world would restart from the beginning, in a cyclical way). From the philosophical point of view, the assimilation of Aristotle's view of the world was done by Thomas Aquinas, in his Summa Theologiae. Thomas also commented several works of Aristotle. Thomas was mainly a theologian, even if his master was Albert the Great, who was also a scientist.

The problem was that one way out of the dilemma was Averroism: admitting a double truth, a scientific one, and a religious one. This could not be allowed at the time (and remains illogical even today).

Duhem went back in history, discovering "what Leonardo had read", and, an author after another, reached back to the XIII and XIV Centuries. He pointed out that the beginning of a real depart from the physics of Aristotle was caused by the 1277 condemnation of 219 of Aristotle's thesis.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Newton's Laws

Modern science really started with the three Laws of Newton in his (Philosophiae naturalis principia mathematicae)

They are normally attributed to Newton, but only the most famous (the Second Law - F=MA (force=mass by acceleration) has been discovered by him.

The Third Law is due to Descartes, and

the First Law (the Law of Inertia) can be traced back to the XIV Century Sorbonne, the Paris University.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Buridan

Jean Buridan was a teacher at the university of Paris, known as La Sorbonne.

Jean Buridan (was born sometimes between 1295 and 1300 -1361)

Master of Arts (not a theologian)

Rector of the University of Paris for some time

Introduced the theory of impetus

Commented works of Aristotle, particularly De Coelo and Physica

We will just use a quote from one of his books (but the same ideas can be found elsewhere in his works).

Ioannis Buridani Expositio Et Quaestiones in Aristotelis Physicam Ad Albertum de Saxonia Attributae. Tome III: Quaestiones (Liber IV - Liber VIII) The original manuscript is dated around the year 1340.

Albert of Saxony was one of his disciples.

Copies of Buridans's books went to other European universities and were familiar to Copernicus and Descartes.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Latin, from a reprint of the XVI Century

Et etiam cum non appareat ex biblia quod sint intelligentiae quae appropriatae moveant corpora celestia, posset dici quod non apparet necessitas ponendi huiusmodi intelligentias, quia diceretur quod Deus quando creavit mundum, unumquemque orbium caelestium movit sicut sibi placuit et movendo eos impressit sibi impetus moventes eos absque hos quod amplius moveret eos, nisi per modum generalis influentiae, sicut ipse concurrit coagendo ad omnia quae aguntur. Sic enim septima die requievit ab omni opere quod pertrarat committendo aliis actiones et passiones ad invicem. Et illi impetus impressi corporibus celestibus non postea remittebantur vel corrumpebantur quia non erat inclinatio corporum celestium ad alios motus, nec erat resistentia quae esset corruptiva vel repressiva illius impetus. Sed hoc non dico assertive sed ut a divinis theologiis petam quod in illis doceant me quomodo possunt haec fieri.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Latin, printed normally

Each line correspond to a line in the previous text

Text same as above

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* French

Where Duhem quoted it, in one volume of the Système di Monde, one of the last to be published. The same quote can be found elsewhere in his work.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* English

Also, since the Bible does not state that appropriate intelligences move the celestial bodies, it could be said that it does not appear necessary to posit intelligences of this kind, because it would be answered that God, when He created the world, moved each of the celestial orbs as He pleased, and in moving them He impressed in them impetuses which moved them without His having to move them any more except by the method of general influence whereby He concurs as a co-agent in all things which take place […] and these impetuses, which He impressed in the celestial bodies, were not decreased nor corrupted afterwards, because there was no inclination of the celestial bodies for other movements. Nor was there resistance which would be corruptive or repressive of that impetus.

From a book of Marshall Clagett, The Science of Mechanics in the Middle Ages (1959) p. 536, with minor modifications after checking the Latin text.

This is the first enunciation of the principle of Inertial motion.

For Aristotle the world was an immense living organism. Here we have a world which, after having been created by God, is given by Him an "impetus", and the movement of the planets

You may wonder why Stanley Jaki is mentioned in the title of this talk.

Let us introduce here his commentary to this statement of Buridan:

Start of quotation:

The text is a mixture of good theology and of a physics which contained good, imperfect, and bad elements. In history nothing worthwhile ever comes in a perfect form. Undoubtedly good in that physics was the reference to friction which diminishes the quantity of motion given to a particular body. Physically, Buridan's reference to the absence of friction should seem of great significance. Inertial motion is conceivable only if external forces, such as friction, do not act on a moving body. Only then can the body retain its quantity of motion, which Buridan called impetus and which later was called momentum. Something bad, indeed very bad, lurked behind Buridan's reference to the inclination of celestial bodies to any motion. And imperfect was Buridan's idea of a circular motion as being inertial. Buridan was not yet Newtonian to the extent of seeing that a truly inertial motion could not be circular, but only linear.

Almost three hundred years later Galileo still held that the motion of planets and of the earth was inertial in spite of their circular orbits. And certainly such was the case with Copernicus, whose answer to the objections which the earth's twofold motion posed implies a knowledge of Buridan's ideas of inertial motion.

Copernicus learned about Buridan ideas, which he found in Buridan commentaries on Aristotle's cosmological work, On the Heavens, while he studied in Cracow. There the university library still has a dozen manuscript copies of Buridan's manuscript. Copies of it are to be found in all significant medieval university libraries. Such is the proof, if proof is needed, that a wide and positive reception greeted Buridan's ideas, which were further developed by his disciple, Nicole Oresme, who after having succeeded Buridan in the Sorbonne, became bishop of Lisieux.

End of quotation

The text comes from a small booklet of Father Stanley Jaki: Christ and Science, published in 2000.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Stanley Jaki

Stanley Jaki was a benedictine priest, an historian of science, a theologian, and had a degree in Physics as well. Born in Hungary, he spent most of his life in the United States. He lived in Lawrenceville, near Princeton. He took over the work of Pierre Duhem, while dealing, during all his life with the problem of science and religion.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Years in the life of Jaki

Life and works

(a total of over 700 between essays and books),

1924 Born in Györ (Hungary), 17 August

1942 Enters the Benedictine convent of Pannonhalma (Hungary)

The main Benedictine Monastery in Hungary

His two brothers were benedictine priests too, one in Györ, one in Pannonhalma)

1947 Sent to Rome for completing studies (Pontifical Athaeneum of Sant'Anselmo)

1948 Ordered priest in Assisi (by the then benedictine bishop of Assisi)

1950 Degree in Theology (Les tendences nouvelles de l'ecclesiologie)

1950 Sent to the United States, as a teacher

...instead of going back to Hungary

(in 1953 after a tonsillectomy, he had hemorragies, and almost lost his voice for several years, so he could not teach any longer, and decided to study instead)

1957 Ph.D. in Physics (Fordham)

The dissertation was entitled "Radon, Thoron [which are rare gases], and Their Decay Products Above and Within The Earth's Surface". Although the title may sound rather abstract, it is known that these gases are one of the causes of lung cancers (second only to cigarette smoking). This is, by his own admission, the only scientific experimental activity Father Jaki has made.

1966 The Relevance of Physics

His first major work (can be seen as his short version of Le système du monde). Several mentions of Duhem

1966 Professor at Seton Hall (New Jersey) (damnatus ad litteras)

He was invited to join the Faculty of Physics of Seton Hall, and just keep a seminary once a week (this he could do), and continue to write books. This he defined as being "damnatus ad litteras", or condemned to writing. The original Latina expression is Damnatus ad metalla, comdemned to work in the mines.

1974 Science and Creation

Prosecution of Duhem work: why only in the Christian Middle Ages?

1987 Templeton Prize

"It is above all for his immense contribution to bridging the gap between science and religion, and his making room in the midst of the most advanced modern science for deep and genuine faith, that he received the Templeton Prize."

1988 The Savior of Science

1990 Member of the Pontifical Academy of Science

1996 Bible and Science

1998 Genesis 1 Through the Ages

2002 A Mind's Matter (Intellectual autobiography)

2009 Dies in Madrid, 7 April

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* The Relevance of Physics

Describes the 3 chief world models of physics:

The World as an organism (Aristotle)

The world as a mechanism (Newton)

The world as a pattern of numbers (Einstein)

Then there is an exploration of the research fields in Physics

Then there are chapters dealing with the relation fo Physics to

biology

metaphysics

ethics

theology

And a conclusion about the role of physics today:

In short, and this is one of the main thesis of Jaki, science is relevant about all that has to do with measurement. What cannot be measured cannot be the object of science (in particular, God, but also, for example, ethics).

(a further book about the relationships between physics and the mind

came out with the title Brain, Mind and Computers in 1969)

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* receives the Templeton prize

He got the Templeton prize in 1987, and it was presented him by Philip of Edimburgh, the husband of Queen Elizabeth. A couple of other famous people who got the Templeton prize are Mother Theresa and Solzhenitsyn. Also shown is the medal, dated 1990, that marked his entry in the Pontifical Academy of Sciences

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Jaki's follow up: Science and Creation

Father Jaki in 1974 produced a work, Science and Creation, which examined the reasons for the failed rise of science in all ancient civilization, and for its only birth in the(Christian) European civilization, starting in the Middle Ages. One of the impressive points common to all ancient civilizations is a cyclical idea of time, a generalization of the cycle of the seasons, which, through the idea of the "great year", supposed that all would one day started over, and for this reason it was useless to ask how the world worked. Only the Judeo-Christian concept of time was a linear one, with a beginning, creation, and one development in time until the return [for Christians] of Christ.

India, China, Maya/Aztech, Egypt, Babylon, Greece, Islam

A reprint is being prepared, it will be used for a course to be kept by Stacy Trasancos at Seton Hall University in the Spring of 2017.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Jaki and Duhem

"For five or six years, or roughly from 1978-83, I literally lived most of my days with tangible ties to the memory of Pierre Duhem."

Stanley Jaki, A Mind's Matter (p. 69)

(that chapter of Jaki's autobiography is titled "A Kindred mind")

Father Jaki went to France several times, retraced a lot of original documents left to a friend by Jaki's daughter, visited all the places of the life of Duhem, published books about Duhem, had Duhem's works translated into English, actually starting from 1969.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Jaki and Duhem (books)

1969 To Save the Phenomena

1985 Medieval Cosmology: Theories of Infinity, Place, Time, Void and the Plurality of World

1987 Premices philosophiques

1988 The Physicist As Artist: The Landscapes of Pierre Duhem

1989 Au pays des Gorilles

1991 The Origins of Statics

1991 German Sciences

1994 Lettres de Pierre Duhem à sa fille Hélène

1995 (Chinese translation of) La Théorie Physique, son object - sa structure

Books:

1984 Uneasy Genius: The Life and Work of Pierre Duhem

1991 Scientist and Catholic: Pierre Duhem (1991 in French, 1996 in Spanish)

1992 Reluctant Heroine: The Life and Work of Hélène Duhem (2007 in French)

When researching the history of the birth of science, Father Jaki started to appreciate the work of Pierre Duhem, a French Catholic physicist who lived between the nineteenth and twentieth century, and to whose historical research we owe the first information on the medieval origins of modern science. Duhem is the author of the monumental work in 10 volumes Le Système du Monde, the history of cosmological doctrines from Plato to Copernicus.

Father Jaki "adopted" this scholar, and he also wrote his biography in 1984, track down in France original documents related to him.

Father Jaki then devoted other books both to Pierre Duhem and to his daughter Hélène, who carried on the difficult task of completing the publication of the last volumes of the Système du monde after the death of his father.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Chinese Intro

The date can be recognized clearly (and also the "L." of Stanley L. Jaki).

Actually some of the notes have names and titles of books written using our alphabet.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Au pays des Gorilles

Satire about the glorification of great Primates (as inspired by the works of Charles Darwin). In Spain today we are not that far...

It was a kind of representation, with also musique and text to be sung by various people. Some politician of that period in France were named. Duhem was persuaded to sign Ch. Clérice by his friends (it could cost him the explusion from the University). Ch. Clérice could be Charles Clérice, but also Chanoine Clérice. Clérice, of course has the same root of the word "clerical".

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Savior of Science

A non cyclical conception of time was common to Hebraism, Christianity and Islam. Hebraism after Christ, tended to go (philosophically) toward Pantheism, ignoring the fact of creation out of nothing and in time.

Islam had for centuries the monopoly of the texts of Aristotle, but no real science come out from them. Their idea of God allowed only for "customs", not for natural laws. As Maimonides, an Hebrew philosopher put it:

They say that the thing which exists with certain constant and permanent forms, dimensions, and properties, only follows the direction of habit, just as the king generally rides on horseback through the streets of the city, and is never found departing from this habit; but reason does not find it impossible that he should walk on foot through the place: there is no doubt that he may do so, and this possibility is fully admitted by the intellect. Similarly, earth moves towards the centre, fire turns away from the centre; fire causes heat, water causes cold, in accordance with a certain habit; but it is logically not impossible that a deviation from this habit should occur, namely, that fire should cause cold, move downward, and still be fire;...

Moses Maimonides, The Guide for the Perplexed

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Savior of Science 2

Christian instead, had, of course, Christ, the Monogenes, the only Begotten Son of the Father, in whom everything was created. So the Universe was a mere creature (no pantheism possible), and had to be rational, as expression of a benevolent God. In the word of Father Jaki: "If the Logos was fully divine, its creative work had to be the paragon of logic and order"

That was a powerful motivation for a lot of research during the centuries, including the one performed by Copernicus.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* A book about all this?

Questions on Science and Religion

When I first met Father Jaki (1999), he was already writing it. It took four more years to complete, it was printed in 2004. It touches most of the subject of this presentation, and can be seen as a kind of synthesis of a number of his books.

A book interesting to understand the vision of Father Jaki is also A Mind's Matter, his intellectual autobiography.

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Closing quote

In memory of Pierre Duhem,

Illustrious professor of the University of Bordeaux,

Excelled by virtue no less than by learning,

Friend of the poor, model of the rich,

Wanted to assist rather than preside,

Loved truth more than friends,

Chastiser of errors, kind to those who err,

Had no enemies, except the enemies of truth,

Covered with merits, forgetful of himself,

Received renown, while fleeing honors,

Worthy of being crowned by Christ in heaven.

Text for a marble plaque to be placed on the wall of the Church, composed by Albert Dufourcq. The plaque was actually never placed there (even if the Parish priest agreed about it), but it describes well the man.