SCIENTIFIC LITERATURE IN LATIN BY THE JESUITS In XVIIth–CENTURY CHINA

by

N. Golvers*

Resumen

Golvers, N.: Scientific Literature in Latin by the Jesuits in XVIIth–Century China. Rev. Acad. Colomb. Cienc. 19 (70): 389-402, 1992. ISSN 0370-3908.

El trabajo desarrolla el doble aspecto de la presencia de los jesuitas en la China de los siglos XVI y XVII: como transmisores de la ciencia occidental a la China, y como transmisores de la ciencia china a Europa. El estudio se restringe a los documentos escritos en latín durante el siglo XVII, pues ese siglo, que comienza con la llegada de **Mateo Ricci** la Ciudad Imperial de Pekín, fue el verdadero comienzo de la misión china en su forma clásica, y porque en ese siglo todavía iba a ser excepcional para los jesuitas escribir sobre la ciencia china en lenguas distintas al latín. El trabajo recorre algunas obras de astronomía, matemáticas, mecánica, geografía de la China, historia natural y medicina que merecen el nombre de "libros", y toca al final la masa documental de cartas y otros materiales no publicados que fueron enviados a Europa por los misioneros jesuitas. A través de estos documentos los jesuitas del siglo XVII se muestran como observadores competentes, abiertos a la nueva información y bien documentados en fuentes de alta calidad. Con estos documentos se establecieron los fundamentos de la sinología occidental.

Abstract

This article develops the twofold aspect of Jesuit presence in China in the XVIth Centuries. as transmitters of Western science to China, as well as transmitters of Chinese science to Europe. The study is restricted to documents written in Latin during the XVIIth Century, because that Century, which begins with the arrival of **Matheus Ricci** to the Imperial City of Peking, was the real start of the Chinese mission in its 'classic' period, and because Jesuit books on science in China not written in Latin are exceptional. The article surveys a number of works on astronomy, mathematics, mechanics, Chinese geography, natural history, and medicine, which merit the name of 'books', and later addresses the documentary mass of letters and other unpublished materials sent to Europe by the Jesuit missionaries. Through those documents, XVIIth– Century Jesuits are revealed as competent observers, susceptible to new information, and well documented in high–quality Chinese sources. Those documents laid the foundations of Western sinology.

* Verbiest Foundation, Blijde Inkomststraat 21, B–3000 Leuven, Belgica (Belgio).

When in the night of 2 to 3 December 1552 **Franciscus Xaverius** died in Chang-ch' uan (South China), a remarkable life came to a premature end;

at the same time, it was the beginning of a new episode in the history of the missions, as well as a new chapter in the history of the relations between Europe and China: I refer to the infiltration, with varying intensity and success, of the Jesuits in the Middle Kingdom in the XVIIth and XVIIIth centuries. For more than two centuries, young men of high intellectual and moral standards, trained in the best European classical traditions, would come to China, with its 4000 year-old culture, would stay here for thirty or forty years, trying to understand Chinese culture and way of thinking, trying to establish a measure of communication with the highest stratum of society, with the ultimate aim of conversion. A gigantic undertaking, indeed, exceeding by far the normal human capacities, but carried by the strength of a never fading faith[1].

In this communication, *science* played a significant role, even becoming one of the most important 'human' resources they applied to achieves their missionary aim. This is partly because the Jesuits — as a consequence of their education — were particularly well-trained in all contemporary European sciences, 'aristotelic' as well as empirical[2], and because the Chinese, with whom they communicated, were 'literati', well-versed in Chinese classical traditions, and not seldom attracted to the 'new', 'western' science. Therefore, since the earliest times of the mission's history, Matteo Ricci (° 1552 — † 1610) had understood that demostrating the superiority of European science (esp. mathematics and mechanics) was the most appropriate way to gain prestige for the mission in this so self-confident *(superbus)* country and, in consequence, for the Faith they preached[3]. But, on the other side, the Jesuits were to some extent receptive to Chinese science as well, at least in the fields of geography, natural history and medicine.

In general, their scientific presence in China thus displays a *twofold aspect*, as they were transmitters of western science to China[4] as well as transmitters of Chinese science to Europe. Testimonials to this twofold process are: a large and varied bibliography of Chinese works on European science[5]; some written reports in Latin of their own scientific activity in the transmission of European knowledge; the presence of Chinese books and collections in Europe, and several publications on Chinese geography, natural science and medicine in European lenguages.

I will try, in this paper, to present a synoptic view of both aspects of this remarkable communication and mutual transfer process, insofar as it was expressed in Latin and took place within the limits of the XVIIth century. However arbitrary this definition may seem, it is not totally without historical justification: the beginning of the XVIIth century, with the entrance of M. Ricci in the Imperial City of Peking, was indeed the real start of the Chinese mission in its 'classic' and most glorious form; on the other hand, Jesuit books on science in China not expressed in Latin are exceptional in the XVIIth century, a situation which would only change substantially with the arrival of the French Jesuits, who used mainly their mother tongue, at the end of the same century[6].

1a. Astronomy

Within the particular context of China, astronomy and the related mathematical sciences attracted most of their attention: this was because of the extreme importance of the calendar, of calendar making, of eclipse prediction, etc. in Chinese society. In Ming China, up to 1644, native astronomy <. . . quae jam a quater mille annis et amplius ortûs sui splendorem jactabat >[7] went through a deep crisis, characterized a. o. by a shortage of competent calendar makers in the Imperial Astronomical Bureau; a loss of astronomical knowledge, and a declining prestige of the calendar making profession; this, in turn, resulted in many errors in the yearly promulgated calendars, with far—reaching social and political consequences[8].

In order to re—establish Chinese calendrical methods on firm foundations, Ricci, in close collaboration with Hsü Kuang—ch' i, a very influential and high—ranking Chinese convert[9], translated and revised, over several years, the first 6 books of Euclid's *Elementa Geometriae* into Chinese (1606-1619)[10]. Moreover, after the institution of a 'new' or western' bureau in 1629, an impressive effort wast made by Hsü Kuang—Chi' i († 1633), the European Jesuits Nicolo Longobardo (° 1565 — † 1654), Johann Schreck, romanised Terrentius (° 1576 — † 1630), Giacomo Rho (° 1592 — † 1638) and Johann Adam Schall vol Bell (° 1592 — † 1666), with their staff of Chinese converts, to translate all the basic works on European mathematics and astronomy[11].

In this endeavour, the Jesuits were backed by a considerable library, installed in their western residence, called Hsi—t'ang in 1623[12], and also by a regular, albeit time—consuming and risky correspondence with European scholars, mainly in Latin[13]. An example in this respect is the correspondence of J. Terrentius, a. o. his letter of 1623 to the *Mathematici Ingolstadienses*[14]. In this, the young Jesuit, a former member of the 'Accademia dei Lincei' and a devoted Galilean, after many negative answers from Galilei himself, contacted the famous Jesuit university in order to obtain some needed support for his astronomical investigations in China. This short letter illustrates the situation of the Jesuit scientists in China in many respects: it shows the young missionary, two years after his arrival, totally devoted to the study of the Chinese language; being absorbed in the study of Chinese history and astronomy; inquiring about very technical questions concerning astronomical matters, and asking for some fresh information: <. . . praeter ea quae sunt in 'Supplemento Magini'

> , published 9 years before in Venice[15]. The letter also insists on the sending of recently published books, such as Kepler's *Hipparchus*, or on epitomizing them in a letter, as the shipping of books was risky and time–consuming, and time was apparently short[16]. This letter was published with an extensive answer by J. Kepler in 1630 in Sagan–Silesia, and became a much sought–after bibliographical item, even in the XVIIth and XVIIIth century[17].

Another example of this mutual scientific contact, in the opposite direction, is given by the *Observations cometarum anni 1618*, published in 1620 in Ursellis (Oberursel) by the young Bohemian Jesuit **Wenceslas Pantaleon Kirwitzer** (° 1588 – + 1626), and reporting on some unexpected comet observations made in Goa in 1618. This short treatise (only 24 pages in 8°) also illustrates well the Jesuit astronomers at work *in situ*, their zeal and their skill in unfavourable circumstances. This booklet is a bibliographical curiosum as well![18].

The continuous rise of western astronomy in late Ming China, confirmed by the incorporation of the so–called 'Western Rule' in the Imperial Astronomical Bureau in Peking in 1643, was not interrupted by the Manchu invasion of China and the capture of Peking in 1644, a dramatic episode which – thanks to Jesuit reports – echoed widely throughout XVIIth – century Europe[19].

Moreover, after a brutal rupture during the persecution of 1664 – (early) 1669[20], the Flemish Jesuit **Ferdinand Verbiest** (° 1623 – + 1688), in a political context which had become favourable to a European come–back, succeeded, by some gnomon tests and other astronomical proofs in December 1668 – February 1669, in incontestably demonstrating the superiority of the western method. The latter was consequently re–established early in 1669 in its former position and prestige, and Verbiest was appointed as the acting Director of the Imperial Astronomical (or Mathematical) Bureau.. On these proofs, Verbiest published a set of 12 drawings accompanied by a report in Chinese *Ts'e yen chi lüeh)*, and later an even shorter description in Latin of only 6 pages in folio, a *Compendium* to his *Liber Observationum*[21], limiting himself to a terse comment on the figures, not going into the details of the trigonometric and astronomical demonstration.

From 1669 until 1673, Verbiest and his staff worked to provide the old Peking observatory with six splendid instruments in the European way, after the Tychonian model, with some concessions to the Chinese traditions of instrument building[22]. One year later, probably on the occasion of their solem inauguration in May 1674, he published 105 pages in folio, containing 117 drawings, mainly illustrating the six new instruments, their construction, their parts, etc., under the title *I Hsiang T' u* or *Liber Organicus*; besides the 14 vols. of Chinese commentary (*I Hsiang Chih*), a much shorter version, on 11 folio pages, was published in Latin, the so–called *Compendium Libri Organici*. Apart from an introductory note and a Latin description of the instruments, it presents a long digression under the separate subtitle *Imperator ardenti studio and mathesim discendam rapitur*. While the instrument descriptions are again concise, the digression is a well–composed and truly charming picture of the mathematical interest of the then 21–year–old K'ang–hsi Emperor, who had been instructed by Verbiest during several months of 1675 in western mathematics, progressing gradually from Euclid' s basic geometry to the secrets of trigonometry, square roots, etc.

For internal reasons, this *Compendium Libri Organici* must have been finished in the 3rd quarter of 1678 (*terminus ante quem* 24 August 1678). In the same period, this compendium, with the aforementioned *Compendium Libri Observationum* and the 2 sets of drawings, were bound together, maybe to facilitate shipment, into a single volume with the separate title: *Compendium Latinum proponens XII posteriores figuras Libri Observationum necnon prioris VII (I) figuras Libri Organici*. In this form, it circulated widely through Europe[23], and was commented on by **Leibniz** in his *Novissima Sinica*, who also praisefully quoted some passages from it[24].

Apparently not satisfied with the reports on the *astronomica revolutio* of early 1669 by which European astronomy had recovered her former positions, Verbiest published his own account, a veritable *compendium historicum*, called *Astronomia Europaea*[25], a text which, according to internal indications, was composed in 1679, with some later revisions in the first half of 1680[26]. Its first part (ch. 1–11) not only deals with the events of December 1668/February 1669, but also contains many original, first-hand observations on the Chinese calendar, its distribution procedure, and the internal organization of the Imperial Astronomical Bureau.

Of other accounts on astronomical observations, or predictions in Latin, we may – for curiosity's sake – mention Verbiest's *Typus eclipsis lunae anno Christi 1671, Imperatoris Cam Hy decimo, die XVto lunae II . . .*[27], a unique specimen, in which are described the effects of this eclipse for each of the 17 (!) provinces of the Chinese Empire. Concerning the astronomical letters of **Antonine Thomas** (° 1644 – + 1709) – Verbiest's successor in the Astronomical Bureau, cfr. infra sub 5.

1b. Other mathemical and mechanical sciences/ disciplines

The achievements of the Peking Jesuits in the other mathematical disciplines are dealt with in the second part of the aforementioned *Astronomia Eu-*

ropaea, i. e. in ch. 13–27. It presents a short and selective description of the achievements of F. Verbiest and his fellow fathers (the Portuguese Gabriël de Magalhães and Tomé Pereyra, the Italians Luigi Buglio and Filippo Grimaldi) in the decade 1669 – 1679, in the fields of *gnomonica* (ch. 14), *ballistica* (15), *hydragogica* (16), *mechanica* (17), *optica* (18), *catoptrica* (19), *perspectiva* (20), *statica* (21), *hydro-statica* (22), *hydraulica* (23), *pneumatica* (24), *musica* (25), *horolo–technia* (26), *meteorologia* (27) ! The sources are mainly found in contemporary Jesuit scientific publications, mentioned by name or not, such as: A. Kircher's *Magnes sive de arte magnetica opus tripartitum* (1641), his *Ars magna lucis et umbrae* (1646[1]; 1671[2]), his *Musurgia* (1650); the works of G. Schottus, such as his *Technica curiosa* (1664), the works of Chr. Scheiner, M. Bettini, P. Casati, G. Riccioli, etc.

Apart from introducing to China all kinds of lenses and telescopes, tackles and pulleys, thermometer and hygrometer, perspective drawings etc., the Jesuits also developed several variants, or 'new' applications of current instruments. One example is the *hydrargyrologium*, invented by F. Grimaldi ca. 1677; another, even more spectacular one, is Verbiest's steam–driven automotive vehicle (chariot or boat) which, according to experts in the field, was the very first prototype of the automobile ever built, anticipating Denys Papin's invention by about a decade![28] Again, the instrument descrptions are rather short, in many respects incomplete and insufficient – as in the very case of the "auto–motive car" – so that any reconstruction or replica must necessarily be hazardous[29]. We must conclude that the *Astronomia Europaea* is not primarily a scientific book, for experts, but a report on the application of science (and technology) for missionary aims, basically for non–experts, though occasionally giving hints to initiates. The real purpose, indeed, was to convince the authorities and benefactors in Europe of the 'advantages' of this scientific strtegy of missionary work.

The Jesuits not only showed a lively intellectual interest in the study of the Heavens, but they also paid close attention to *the sublunary world*, and to the multiple forms of life on it. In the next part of this paper, I would like to present a short survey of Jesuit scientific literature concerning geography (2), natural history (3) and medicine (4).

2. Scientific literature concerning the geography of China

After a first attempt to produce a *cartographic representation* of the Chinese Empire at the end of the XVIth century[30], it was Martino Martini who – on his remarkable propagandist journey to Europe (1652–1659) – brought another series of maps from China to Europe[31], with Latin commentary, based on the Ming atlases *Kuan–yü–t' u* (1555* 1) or *Kuang–yükao*[32] Martini's *Novus Atlas Sinensis* was finally published in 1655 in Amsterdam by the famous Blaeu printing–house as the 6th volumen of the *Theatrum Orbis Terrarum*, and met with immediate and great success throughout Europe[33]. Apart from an introduction and a general map of the Middle Kingdom, this 'Atlas' presents for each of the (then) 15 provinces: a map with Chinese and European scale; all relevant toponyms in romanized spelling; a continuous description in Latin with all important geographic and physical information concerning cities, inhabitants, rivers, mountains, etc. At last, it gives the geographic coordinates of the capitals of each province, and of the other mentioned places, always with reference to the Peking meridian. A comparison with the actual coordinates shows surprisingly little divergence of only 0,5° for the latitudes, and a slightly larger 0,7° for the longitudes[34].

This work not only considerably increased western knowledge of China and (esp.) of the Chinese interior, it also rectified at least two widespread misconceptions: first the location of Peking and the Great Wall which were both generally represented too far northwards; second, it settled once and for all the dispute concerning the old Cathay realm, proving unequivocally that it was the same as contemporary China[35]. The latter demonstration was elaborated in a separate Appendix (*De regno Catayo additamentum*) by Jacob Golius on the basis of information provided by Martini[36].

Almost simultaneously, another atlas of China was compiled by the Polish Jesuit Michael Boym (1612–1659) during his sojourn in Europe (1652–1655)[37]. It was neither finished nor published, but several manuscript maps and texts of M. Boym, preserved both in Rome and in Paris, are interpreted by B. Szczesniak as *membra disiecta* of a projected but aborted *Atlas Imperii Sinarum*. Apart from several maps, both synoptic and sectorial[38], the commentary, which may have been projected to be appended to the *Atlas*, has been identified by the same author[39] as the *Brevis Sinarum Imperii Descriptio*, a text of 75 pages, now in Rome (ARSI)[40], of which a digest of 24 pages, entitled *Rerum Sinarum compendiosa descriptio*, is in Paris[41]. Only the first 12 pages of the former are of a geographic character; the rest deal with contemporary Chinese history. Finally, a *Magna Tabula Chinensis* giving statistic information, the longitudes of Chinese cities, the sites of Jesuit residences, etc., is probably behind the *Geographiae et Hydrographiae Reformatae Libri XII* by G. Riecioli[42], but the ms. itself is now apparently lost. A last item in this respect, also relying on Martini's material, is the *Paradigma XV Provinciarum et CLV urbium capitalium Sinensis Imperii* (1686), incorporated by Ph. Couplet in his most famous *Confucius Sinarum Philosophus* (Paris, 1687)[43].

In this context, we must also refer to the many *geodesic* operations consecutively underta-

ke by **F. Verbiest** and **Antoine Thomas**. The former described one of his achievements (related to the water supply of some Imperial lands near Peking) in the aforementioned *Astronomia Europaea* (ch. 16)[44]. Another concerns measurements in Tartary, and is described at length in a letter of 1683, recently discovered in Antwerp[45]: it deals with some goniometric problems, more precisely on how to determine the *angulus positionis* on a mountain top from a certain distance and how to find the 'meridian line' in difficult terrain circumstances. The text (of which we have only a *copie du temps*) is illustrated with some hand—drawn geometric figures, supporting the mathematic demonstration. This letter, by chance preserved, illustrates only one detail of Verbiest's scientific duties during the two famous journies through Tartary (Manchuria), in 1682 (East) and 1683 (West) respectively, on which two long written reports in Latin, containing many first—hand geographic and ethnographic details, have been preserved in the author's correspondence[46]; because it was the very first European description of these remote areas, and because of the fresh observation they provided, these letters became very popular in contemporary Europe: they were published and re—published several times, separately or more often integrated in other works, and were translated into French, English and Dutch[47].

The investigations described were part of the preparations for a planned map of Tartary. Such a project for a new atlas of China and Tartary — with geographical coordinates — was indeed proposed to **Verbiest**, according to **A. Thomas**, by the *K'ang—hsi* Emperor, but its realisation was thwarted by the death of **Verbiest** and by the war against the Olöth[48]. At the end of the XVIIth century, Verbiest's fellow countryman, **Ant. Thomas**, was charged with this responsibility, but his activities in the field, as well as those of his French successors, resulting in the so—called *K'ang—hsi Atlas* (ed. 1718), belong entirely to the XVIIIth century, and therefore fall beyond the scope of this survey.

3. Scientific literature concerning 'natural history'

Natural History, esp. botany and zoology, and, to a lesser degree, mineralogy, captured their scientific interest as well.

On the endemic flora and fauna of China, the Jesuits in the XVIIth, and even more in the XVIIIth century, accumulated and described a mass of new data, which once again can be discussed only briefly[49]. Apart from some scattered information in travel accounts or in works of a more general character[50], systematic research started when **J. Schreck/Terrentius** — whom we have already met before — arrived in China, where he worked from 1619 until his premature death in 1630. Thanks to his five Latin letters from India and China to Europe[51], we are able to follow the development of his botanical work[52]. On his death, he had collected and described, according to the *Cheng chiao hsin ch'eng or Sanctae Doctrinae Sincerum Testimonium* (1641), 8000 (!) new sorts of plants[53]. Enhanced by zoological observations, and illustrated by numerous drawing from his own hand, this treasure on the natural history of both (Eastern) India and China was compiled in 2 large volumes, appropriately entitled: *Plinius Indicus*, but it was never completed[54]. What is more, the manuncript was never published. Although it was apparently still available in the middle of the XIXth century in the *libraria secreta* of the *Collegium Romanum*[55], it has since disappeared by the same accident by which the ms. of Verbiest's Manchu grammar was hit!

The restricted freedom of movement indicated by this author as a serious obstacle to further botanic investigations[56], was probably partly compensated by a huge collection of written sources from Imperial Archives, acquired by the Peking Fathers sometime in the course of the XVIIth century. For this important information, we are indebted to **F. Grimaldi**, who communicated it to **Leibniz** at their meeting in Rome in 1689[57]. The former also refers to another obstacle to all scientific research in China by the Europeans: the deeply rooted suspicion on the part of the Chinese authorities towards any show of interest by the 'barbarians'. The Jesuits therefore preferred to transmit such new botanic data sparsely, and < ad modum literarum ex provinciis scriptarum >, i. e. by means of the famous *Litterae Annuae*[58]

Nevertheless, we possess still another Latin treatise on the matter, the *Flora Sinensis*, compiled in Europe by the Polish Jesuit **Michael Boym**, and published in Vienna in 1656[59]. It was the very first systematic and illustrated representation of plants and animals from the Far East/China ever published in Europe; it was apparently also the first time that the term *flora* was used in this sense[60] which, maybe due to the great success of Boym's work in XVIIth—century Europe[61], has since become generally accepted.

The botanical part proper has (partly) been translated from a Chinese botanical source[62], and fills only 35 folio pages, with 17 coloured illustrations, the zoological part only 8 pages with 5 coloured figures. Both plants and animals were from the southern provinces — where Boym's mi sion was situated (Kuanghsi) - and from the surrounding countries. The book describes such plants as rhubarb, ginseng, lychea, papaya, etc., indicating their various names, geographical distribution, physical characteristics, flowering season, the fruit, and occasionally their virtutes or (medical) qualities as well. Several of them originally belonged to . . . the American continent, and **Boym** is the very first testimony for their presence in Southern China[63]. For all these reasons, it remains an important source for the (ethno) botany of the area[64].

Of course, botanic research by the Jesuits did not stop after Boym, on the contrary, it was intensified by the French missionaries[65]; but as the works they composed belong to the XVIIIth century and were written in French, they fall beyond the scope of this conference.

4. Scientific literature concerning medicine

The Jesuits' interest in Chinese medicine was not confined to its botanical aspects. After J. Terrentius (Schreck) — by profession a physician — showed himself particularly receptive to Chinese medical botany, M. Martini in the mid–1650s expressed the Jesuits' admiration for Chinese medicine in the introduction of his *Novus Atlas*, referring a.to. tc their use of plant extracs, cauterization, massage, etc.[66]; an even more 'passionate' interest in the field is attributed to Ph. Couplet in the mid–60s[67]. Most of all, their attention was attracted by pulse diagnostics.

This interest, through both study and translation of authentic Chinese works, resulted in the end in two distinct and influential books:

(1) the *Specimen medicinae Sinicae, sive opuscula medica ad mentem Sinensium*, published in Frankfurt on the Main in 1682 by Andreas Cleyer[68]. This is actually a collection of several short Latin treatises, compiled from various sources (cfr. infra), and apparently not complete[69];

(2) the *Clavis medica ad Chinarum doctrinam de pulsibus*, published by A. Cleyer and Ph. Couplet in Nürnberg in 1686, but compiled by M. Boym[70].

The complex relationship between these two works has been much debated in the past: after P. Pelliot[71] — and some authors after him[72] — had denied any substantial relationship between the *specimen* and the *Clavis*, it has recently been argued— through a strong and well–documented but complex reasoning which cannot be reproduced here[73] — that the two editions are complementary *membra disiecta* of an originally indivisible work by M. Boym on Chinese medicine entitled *Medicus Sinicus;* this work was already projected in the early 50s of the XVIIth century[74], was gradually realised in Goa in 1657 and in Siam in 1658–1659, but was eventually — through a series of accidents published in Europe in separate parts.

These two publications, taken in their mutual connection, deal in various parts with three distinct topics:

(a) with Chinese sphygmology, i.e. the 35 kinds of pulse discerned by Chinese medicine, or the basis of which an illness was diagnosed and even its future course predicted; see e.g. such subtitles as: *de pulsibus libros 4 è Sinico translatos* (SM); *Tractatus de pulsibus ab erudito Europaeo collectos* (SM); *De explanatione pulsuum regulae et discursuum verorum* (SM), etc.

(b) One chapter, the so–called: *Medicamenta simplicia quae a Chinensibus ad usum medicum adhibentur*, part of a more comprehensive *Receptarum Sinensium* liber[75], gives prescriptions for composite drugs, appropriate to curing diseases detected by the method of 'feeling the pulse'; in fact, this is a veritable pharmacopoea with 250 botanical, 25 animal and 22 mineral medicines.

(c) Finally, there is a chapter called de *indiciis morborum ex linguae coloribus et affectionibus.*

In all these respects, the *Medicus Sinicus* — i.e. its published parts — is a truly meritorius introduction to a European public of specific non–European diagnostic, prognostic and curative methods, the more so as the author relies for this purpose on Chinese authors & authorities of the best conceivable tradition, whom he mentions by name, such as Hoam ty, the legendary Yellow Emperor and supposed author of the *Nei Ching*, or *Van Ho'*, i.e. Wang Chou–huo (ca. 300 p. C. n.), author of the *Mo Ching* — and its popularizing summary *Mo Hsüeh*[76]. Moreover, Boym's ms. apparently presented either the Chinese original or at least the Chinese terms in juxtaposition. In any event, the author has really tried to build a bridge between Chinese and European medical traditions: by the (first hand!) romanisation of so many Chinese phytonyms, by occasionally — where possible — proposing an identification with European plants, and — last but not least — by adapting some basic conceptions to European, Galenic terms[77].

So although they were not the only mediators to transmit Chinese medical lore to Europe, nor even the first — this merit must be awarded to the Danish–Dutch physician J. Bontius (° 1598 — † 1631) — the Jesuits were involved in this process from the beginning. Further medical information from China will be transmitted in the XVIIIth century by members of the French mission in Peking, but this need not be treated here.

5. Evaluation

In this synopsis we have included all the XVIIth–century (Latin) titles which are physically identifiable as a 'book', published or not, preserved or lost. In quantitative terms, the harvest may not be quite impressive, but it must be remembered that the first duty of the Jesuits in China was of a missionary and pastoral nature, and that science — though instrumental to the mission — was only a secondary occupation for them.

However, the picture that issues from this overview must be corrected and complemented by a considerable number of letters and other unpublished material sent to Europe: the already mentioned letters on botany of J. Schreck (Terrentius); the letters by A. Thomas with astronomical information[78]; others concerning the phenomena of magnetism by the same or by M. Martini[79], and many other which contain only some cursory information of a scientific nature. Although not published, their content and information enjoyed a certain diffusion because they were passed on — on a small scale, i.e. within the circuit of Jesuit scientists — and occasionally were copied for this purpose. In not a few cases, the materials they included were assimilated (sometimes in extensive quotations) in works of a much larger scope, dealing with China in an exclusive way or not; we refer in the first place to the *China Illustrata* by A. Kircher, composed in the *Collegium Romanum* and provided with the information which had arrived here in written form or 'viva voce', i.e. through the China missionaries on their visit to Rome (M. Martini; M. Boym; J. Grüber, H. Roth; Pr. Intorcetta; Ph. Couplet)[80]. Another example is to be found in the *Geographieae et Hydrographiae Reformatae Libri XII* by G. Riccioli in which part of the unpublished Boym materials on Chinese geography are incorporated and preserved, including the abovementioned scientific information from Martini's letters.

Only when we put these data together with the literary production of the Jesuits concerning Chinese history (both ancient and contemporary), Chinese chronology, philosophy, linguistics . . . , we get a just appreciation of the high, various and continuous intellectual devotion by which they tried to understand their country of election.

The quality of these works, on the other hand, is the direct consequence of three facts: first the thorough education of the Jesuits which made them *competent* observers of a new world; second, their own intellectual curiosity by which they became *susceptible* for new information; finally, the excellent quality of the sources behind their information, either originating from their own experiences mostly acquired in unconfortable conditions, or relying directly on authentic and good Chinese sources, of which several are translated and commented, or at least explicitly quoted. Only in the field of astronomy and the mathematical—mechanical sciences did they display a kind of western superiority, probably as a reflection of the obvious decadence of Chinese astronomy in late Ming — early Ch'ing China, and as an echo of Ricci's authoritative opinion concerning < Le cose absurde dell'astronomia Cinese > which had become a firm conviction in Jesuit circles[81]. With all this, they laid the scientific foundations of western sinology, which would become, both in substance and in depth, developed further in the next century, mainly by the contribution of the French Jesuits. At the time, however, French had largely replaced Latin in the communication with Europe, though the contacts, for instance, with the Imperial Academy of St. Petersburgh, still occurred in Latin[82].

Notes

Note the following abbreviations:

ARSI: Archivum Romanum Societatis Jesu
JS: ibd., Fondo Japano—Sinica
BNP: Paris, Bibliothèque Nationale
RVE: Roma, Bibliotheca Nazionale Vittorio Emanuele

1. Some general works on the Jesuit mission in the XVIIth—XVIIIth century are: G.H. Dunne, *The Jesuits in China* in the *last days of the Ming Dynasty*, Chicago, 1947; F. Bortone, *I Gesuiti alla Corte di Pechino*, Roma, 1969; Ch. E. Ronan & Bonnie B.C. Oh. (eds.), *East meets West: the Jesuits in China 1582—1773*, Chicago, 1988. For the personalia of the missionaries, both bio— and bibliographical, see L. Pfister, S.J., *Notices biographiques et bibliographiques sur les Jésuites de l' ancienne mission de Chine*, 1552—1773 (Variétés Sinologiques, No. 59—60), 2 vols, Chang—Hai, 1932—1934, and J. Dehergne, *Répertoire des Jésuites de Chine de 1552 à 1800* (Bibliotheca Instituti Historici S.I., vol. XXXVII), Roma—Paris, 1973.

2. See St. J. Harris, *Jesuit Ideology and Jesuit Science: Scientific Activity in the Society of Jesus*, 1540—1773, Ph. D. diss. Wisconsin—Madison, 1988.

3. The conviction that the China mission was particularly well—suited to the Jesuits precisely because of the rationalistic (intellectual) character of both the Jesuit and the Chinese education, is e.g. well expressed in the following passage from the famous letter of F. Verbiest to his fellow—fathers in Europe, dated August 15, 1678 (cf. H. Josson, S.I. & L. Willaert, S.I., *Correspondance de Ferdinand Verbiest de la compagnie de Jésus (Directeur de l' Observatoire de Pékin*, Bruxelles, 1938, pp. 245—246):

< Certe inter omnes utriusque Indiae Missiones nulla est alia quae hominibus Societatis nostrae videtur magis propria, et quae Instituto nostro videtur magis convenire quam haec Sinensis. Nam cum Societas litteras et omnis generis scientias singulari studio profiteaur tamquam aptissimum medium quo homines ex natura sua ratione praediti facilius ad veritatem et virtutem inducuntur, inter Orientales et Occidentales Indias nulla est

natio quae in litteris et omnis generis scientiis excolendis aestimandisque Sinis comparari possit, quaeque tam praeclare et distincte de virtute iudicet. Nam de omni re praesertim morali plurimos habent libros, et copiosas passim ostentant bibliothecas. Nullus est fere inter Sinas qui, licet sit infimae sortis, filios suos non applicet studiis. Nam in hoc Imperio homines etiam infimae sortis per litteras suas ascendunt ad magnas dignitates, ad magistratus inquam et munia publica gerenda; nec ulla alia via aperitur ad illa consequenda quam per litteras, compositiones et examina, quibus paulatim ascendunt ad gradus baccalaurei, licentiati, doctoris, plane sicut apud nos in Europa. Unde sine comparatione ulla maior est numerus studentium in una Sina quam in tota Europa. Atque hi omnes habent auctores suos classicos et interpretes eorum ab omni antiquitate per totum Imperium receptos, atque eosdem ubique, qui pleni sunt documentis moralibus et nihil continent contra fidem et bonos mores. Hos auctores magistri explicant, discipuli mandant memoriae; ex his desumunt themata compositionum, habent suas chrias, orationes, poemata, omnino sicut apud nos studiosi litterarum humaniorum, quae exhibent magistro corrigenda, etc. >.

This text is immediately followed by a plea for the institution of Chinese < classes litterarum humaniorum >, with a < ratio studiorum > based on the 'Chinese classics', in the European fashion.

4. On the transfer of European science to China through the Jesuits, reference may be made to the biographies of some individual Jesuits, a.o. those of **J. Terrentius, J.A. Schall von Bell, F. Verbiest** in **P.H. Couplet**, *Catalogus Patrum Societatis Jesu* (. . .), s. l., 1686 and the bibliographies in **Pfister**; in addition, see: **H. Bernard** [—Maître], *L' apport scientifique du Père Matthieu Ricci a la Chine*, Tientsin, 1935; id, *Notes on the Introduction of the Natural Sciences into the Chinese Empire*, in: "Yenching Journal of Social Studies", vol. 3, 2, 1941, pp. 227—238; **P. D'Elia**, *Galileo in China. Realzione attraverso il Collegio Romano tra Galileo e i Gesuiti scienziati missionary in Cina* (1610—1640), (Analecta Gregoriana, 37), Roma, 1947; id., *The spread of Galileo's discoveries in the Far East (1610—1640)*, in: "East & West", I, 1950, pp. 156—163; **H. Bernard** [—Maître], *La science européenne au Tribunal Astronomique de Pékin* (XVII° — XIX° siècles) (Les Conférences du Palais de la Découverte, Série D, nr. 9), Paris, 1951.

5. See esp. **H. Bernard—Maître**, *Les adaptations chinoises d' ouvrages européens. Bibliographie chronologique depuis la venue des Portugais à Canton jusqu' à la mision française de Pékin*, in "Monumenta Serica", 10, 1945, pp. 1-57; 309-388.

6. **This is but a reflection of a more general shift in Jesuit publications, around the end of the XVIIth century, from a predominant use of Latin to a preference for the 'national languages', as demonstrated by ST. J. Harris,** *Jessuit Ideology*, pp. 149-150:

   < the measurement of yet another parameter of Jesuit publication in science, language, only reinforces the interpretation that 1700 marks an important watershed in the history of Jesuit science. By again dividing our pool of scientific publications into two groups, those works published before 1700 and those published after, we find that the proportion of works written in Latin drops from three quarters of the former period to one half in the latter . . . >

7. **F. Verbiest**, *Astronomia Europaea*, Dilingae, 1687, p. 46.

8. On the decline of Chinese astronomy and calendar making, see a. o. **Ho Peng—Yoke**, *The Astronomical Bureau in Ming China*, in "Journal of Asian History", III/2, 1969, pp. 137-157 (esp. p. 148 ff.); **T.H. E. Deane**, *The Chinese Imperial Astronomical Bureau: Form and Function of the Ming Dynasty Qintianjian*, Ph. D. diss. Seattle, 1988, pp. 401-441 deals more in detail with the problems which arose and the proposed solutions.

9. On **Hsü Kuang—ch'i**, by his Christian name 'Doctor Paulus', and the western calendrical academy, see a.o. **J.C. Yang** in: **A.W. Hummel**, *Eminent Chinese of the Ch' ing Period* (1644-1912), Washington, 1943 [Taipei, 1970], pp. 316-318; **M. Uebelhoer**, *Hsü Kuang—ch'i (1562—1633) und die Einstellung zum Christentum (. . .)*, in "Oriens Antiguus", 15, 1968, pp. 191-257; 16, 1969, pp. 41—74, and esp. **K. Hashimoto**, *Hsü Kuang—ch'i and Astronomical Reform (. . .)*, Osaka, 1988.

10. On this translation, based on the Latin translation by **CHR., Clavius** (Roma, 1574& 1), see also **L. van Hee**, *Euclide en chinosis et en manchou*, in "Isis", 30, 1939, pp. 84-88; **P. D' Elia**, *Presentazione della prima traduzione cinese di Euclide*, in "Monumenta Serica", 15, 1956, pp. 161-202; **K. Hashimoto**, *Hsü Kuang-ch' i*, pp. 11-12.

11. This resulted in a real astronomical—calendrical encyclopaedia, perhaps an heir of the renaissance 'encyclopedismo', containing about 120 *chüan* (volumes) of which the original edition (1627—1635: see ARSI, JS 115, II, f. 323 v.) was called *ch' ung—cheng li—shu* ("Treatise on the [astronomical and] calendrical science of the Ch'ungchen reigh"). This *encyclopaedia* is described by its editor, **J.A. Schall von Bell**, s. j., in the following terms:

< Totum opus in tres classes divisimus, quarum prima omnia introductoria et quomodolibet astronomian adjuvantia contineret, altera theoriam planetarum, eclipsium ac fixarum eorumque omnium tam calculandi quam dimetiendi methodum; tertia pro facilitando calculo omnia ad confectas tabulas referret, ita ut nulla opus esset solutione triangulorum vel labore qui mathematicos a studio novae regulae posset deterrere. Haec omnia centum quinquaginta libellis comprehensa quinque plus minus annorum spatio assiduo labore a nobis composita ac tum a Doctore Paulo correcta et stylo elegantiori ornata in lucem dedimus >.

(cf. *Relation Historique*. Texte latin avec traduction française du P. Paul Bornet S.J. Tientsin, 1942, p. 17).

12. The original nucleus of this library was collected by **N. Trigault** in the first decades of the 17th century and was installed in Peking in 1623. Steadily expanded, esp. by means of gifts, its capacity amounted to about 3000 vols. in 1644, when the library miraculously escaped a potential disaster during the Manchu invasion of Peking (see: **A. Vaeth**, *J.A. Schall von Bell*, Köln, 1933, p. 148, from *Tsou Shu*, II, 1—3). Always growing, merged with other local Jesuit collections, a.o. the library of the French mission Pei T'ang, partially damaged in many dramatic circumstances, a collection of 4100 titles (5133 vols.), of which 2038 (= 50%) in Latin, was still preserved in 1949 at the dawn of Maoist times; they were rediscovered only by accident some years ago by **J.S. Cummins**, having been incorporated, in alphabetical order, into the Rare Books Section of the Peking Municipal Library (Peiching T' ushukuam) (see **J.S. Cummins**, *The present Location of the Pei T'ang Library*, in: "Monumenta Nipponica", 22, 1967, pp. 482-487). Though no longer existing as a separate entity, it is surely one of the most remarkable 'renaissance libraries' still existing (in which 757 titles, or 629 vols., of the oldest nucleus survive !), an unexploited testimony to the Jesuit scientific (and missiologic) presence in China for centuries ! The catalogue of this library has been made up by **H. Verhaeren**, *Catalogue de la Bibliothèque du Pe— t' ang*, Pékin, 1949, which has a long history of the collections on pp. V—XXXV. See further a.o. **J. Laures**, *Die alte Missions—bibliothek in Peit— t'ang zu Peking*, in: "Monumenta Nipponica", 2, 1939, pp. 124-139; **H. Bernard**, *Une bibliothèque médicale de la Renaissance conservée à Péking*, in: "Bulletin de l' Université l' Aurore", 8, 1947, pp. 99-118; **A. Retif**, *Une bibliothèque de la Renaissance en Chine*, in: "Bulletin de l' Association Guillaume Budé", 1953, pp. 113-123.

13. On Jesuit correspondence from China to Europe, the distinct ways and the respective duration of the mailing, both depending on the various shipping routes, see esp. **C.W. Essels**, *Iets over het briefverkeer in de XVIe en XVIIe eeuw, in't bijzonder met de missiegebieden in O. — Indië en China*, in: "Studiën. Tijdschrift voor godsdienst, wetenschap en letteren", 116, 1931, pp. 221-233; **E. Lamalle**, in "Archiva Ecclesiae", XXIV—XXV, 1981/1982, pp. 99-100; **T.B. Duncan**, *Navigation between Portugal and Asia in the 16th and 17th centuries*, in **C.K. Pullapilly & E.J. van Kleij**, *Asia and the West-Encounters and Exchanges, from the Age of Explorations. Essays in honor of D.F. Lach*, Notre Dame, Indiana, 1986, pp. 3-25.

14. The 5 Terrentius letters from the Far East (1619—1623) were published by **G. Gabrieli**: *Giovanni Schreck Linceo Gesuita e Missionario in Cina e le sue lettere dall' Asia*, in "Rendiconti dell'Accademia dei Lincei (Classe Scienze Morali)", 1936, pp. 564-514, and esp. pp. 490-511; a German translation is to be found in: **H. Walravens**, *China Illustrata.* Das *Europäische Chinaverständnis im Spiegel des 16. bis 18. Jahrhunderts*, Weinheim, 1987, pp. 22-35.

15. I. e. the *Supplementum Ephemeridum, ac Tabularum Secundarum Mobilium* (. . .), Venetiis, 1614. Three copies of this book are preserved in the Peit—t' ang Library, of which at least two were contemporary with Terrentius (**H. Verhaeren**, *Catalogue, nrs. 2152—2153); one (*Ibidem, nr. 2152) was the private copy of **Jacob Rho** ("Jacobi Rhaudensis — in nomine Dni"), who succeeded **Terrentius** upon his death in 1630 (May, 11). There are many handwritten references in its margins, which proves these tables were intensively consulted in Peking indeed (we owe this remark to **H. Bernard** in: "Monumenta Serica", 3, 1939, p. 67.

16. < Eos libros exspectare nimis longum est, facillime detinentur aut pereunt, quod non mittantur pluribus viis: charta facilius et citius huc pertingit nimirum intra tres annos > **G. Gabrieli**, *Giovanni Schreck Linceo*, p. 510. This demand for up—to—date information from Europe is a recurrent theme in Jesuit letters, as we will show on another occasion; suffice it to underline here that this fact alone refutes the often-heard accusation that the Jesuits had — intentionally — transmitted old—fashioned European science to China.

17. The exact title is: *R.P. Ioannis Terrentii è Societate Jesu Epistolium ex regno Sinarum ad mathematicos Europaeos missum: cum commentatiuncula Joannis Kepleri mathematici. Ejusdem ex ephemiride anni MDCXXX,*

de insigni defectu solis, apotelesmata calculi Rudolphini, Sagani Silesiae (P. Cobius & J. Wiske), MDCXXX. A recent description has been given by **H. Walravens**, *China Illustrata*, p. 245 ff. Especially the correspondance suivie between Leibniz and the French Jesuits in China proves how much—sought this little volume (of 13 pages) was in the XVIIth/ XVIIIth century (see **R. Widmaier**, *Leibniz korrespondiert mit China*, Frankfurt a/M, 1990, pp. 17-18; 65; 130; 141; 176; 206; 215; 218; 235; 238).

18. **W.P. Kirwitzer**, *Observationes cometarum anni 1616* (sic !) *in India Orientali factae a Societatis Jesu mathematicis in Sinense regnum navigantibus* (. . .), Ursellis, 1920. The same comets habe been commented on by other scientists as well, a.o. in a treatise, published by **E. Bovarro Frances**, and extensively quoted in Peking by **F. Verbiest** in 1661 (**H. Josson, S.I. & L. Willaert, S.I.**, *Correspondance*, pp. 98-100).

19. On this theme, see **E.J. van Kleij**, *News from China; Seventeenth—century European Notices of the Manchu Conquest*, in "Journal of Modern History", 45, 1973, pp. 561—582; a particularly well—composed first—hand report on this period is given by **J.A. Schall von Bell**, s. j., in his *Historica Narratio de Initio et Progressu Missionis Societatis Jesu apud Sinenses*, Vienna, 1665.

20. See on this painful period, a. o. **G. Gabiani**, *Incrementa Sinicae Ecclesiae* (. . .), Vienna, 1673, which is based on both the written and oral eyewitness report of **F. Verbiest** and on the diary kept by **L. Buglio** and **G. De Magalhaes.**

21. The title *Compendium Libri Observationum*, although very plausible, is not attested as such. The author refers to it in his *Astronomia Europaea* (cf. n. 25), p. 16: < Cum de observationibus singulis . . . compendium Sinicum a me editum sit, et hujus compendij aliud brevissimum latino idiomate postea scriptum sit, quod in fine hujus tractatus subijcio . . . > . All the bibliographical, philological and historical aspects of this and the following astronomical writings of **F. Verbiest** will be treated in the introduction to my forthcoming edition of the *Astronomia Europaea (Monumenta Serica, Monograph Series).*

22. For a comparative study of these instruments see a.o.: **A. Chapman**, *Tycho Brahe in China: the Jesuit Mission to Peking and the Iconography of European Instrument—Making Processes*, in: "Annals of Science", 41.5, 1984, pp. 417-443; **L. Iannaccone**, *From Tucho Brahe to Isaac Newton: Ferdinand Verbiest's Astronomical Instruments in the Ancient Observatory of Beijing*, in: "Memorie della Società Astronomica Italiana", 60, 1989, pp. 889-906.

23. Copies are e.g. in Brussels (Koninklijke Bibliotheek, V.H. 31075), Paris (BNP, Rés. V. 710).

24. It concerns Leibniz's comment, entitled *Relatio de Libro Sinico Latino R.P. Verbiestii*, of which the ms. has been preserved in the Leibniz Archiv (Niedersächsische Landesbibliothek, Lbz. 306 ff. 18—19) and which is edited in the *Novissima Sinica*, Leipzig 1699², pp. 144-155, with 'passim' several other references to **Verbiest.**

25. Its full title is: *Astronomia Europaea sub imperatore Tartaro—Sinico Cam Hy appellato ex umbra in lucem revocata à P. Ferdinando Verbiest Flandro—Belga e Societate Jesu Academiae Astronomicae in Regio Pekinensi Praefecto*, Dilingae (J.C. Bencard), 1687. Copies of this rare book are now present e.g. in Brussels, Koninklijke Bibliotheek (VH 8307 A/LP), in Gent (Universiteitsbibliotheek, Acc. 1339 (8), in München (4 copies, a.o. one in the Bayerische Staatsbibliothek, 4 Astr. 4—152), in Paris (BNP 8225), in Leiden (Rijksuniversiteit).

26. All the evidence available is given in the aforementioned edition of the *Astronomia Europaea* (see n. 21).

27. Now preserved in Chantilly (Fonds Brotier, 111, f° 89r. 89v); according to **J. Dehergne** in his *Inventaire de la Mission de Chine aux XVIIe et XVIIIe siècles*, Chantilly, [1974], p. 27, it would only be a copy.

28. Among the rich literature on this topic, I mention only the contributions by **L.L. Thwing**, *Automovile Ancestry*, in "Technology Review (MIT)", Febr. 1939, pp. 169-170; **J. Bouman**, *Oude auto's en hun makers*, Bussum, 1964, p. 24; **J.D. Scheel**, *Peking Precursor. A Monograph (Extracts first published in Automobile Quarterly*, XXIII. 3, 1985).

29. Some complementary information can be found, however, in several *Litterae Annuae*, esp. those of 1677—1680 (ARSI, JS 116 f° 214 ff.) and of 1678—1679 (ARSI, JS 117, ff. 161—182; 183—188r).

30. In 1589, **M. Ruggieri** brought some maps from China to Rome which remained unpublished: cfr. **H. Bernard**, *Les sources mongoles et chinoises de l' atlas Martini (1655)*, in "Monumenta Serica" 12, 1947, p. 132. They are found again in the 'Archivo di Stato' in Rome, or 78 folio pages (57 x 43 cm.) which clearly constitute the preparatory stage to a — never

achieved — atlas: cf. **E. Lo Sardo**, *Il primo atlante delle Cina dei Ming. Un inedito di Michele Ruggieri*, in: "Bollettino della Società geografica italiana", series XI, vol. 6, 1989, pp. 423-447.

31. An overview of the European cartography of China in the XVIIth century is given by **B. Szczesniak**, *The Seventeenth Century Maps of China. An Inquiry into the Compilations of European Cartographers*, into "Imago Mundi" 13, 1956, pp. 116-136.

32. On the sources digested in the Martini atlas, see the note by **N. Witsen** in 1648 in his copy of the Martini—Atlas, preserved in the Museum Meermanno—Westreenianum in The Hague (115 B 1), of which an English translation is given by **C. Koeman**, *Joan Blaeu and his Grand Atlas*, London—Amsterdam, 1970, p. 85. Cfr. also: **H. Bernard**, *Les sources mongoles, pp. 127-144.* **TH.N Foss**, *A Western Interpretation of China: Jesuit Cartography*, in *East meets West* (see n. 1), p. 216 also refers to the < late Ming dynasty local gazetteers >, but many other Chinese sources still remain unidentified. Cfr. also **G. Melis** (ed.), *Martino Martini, geografo, cartografo, teologo. Trento 1614 — Hangzhou 1661*, Trente, 1983, pp. 138-139 and **M. Martini**, *Novus Atlas*, pp. 3-4.

33. On this *Novus Atlas Sinensis*, published simultaneously in Latin, Dutch, French and German, see a.o. **F. von Richthofen**, *China*, 1877, I, pp. 674-677; **J.J.L. Duyvendak**, *Early Chinese Studies in Holland*, in "T' oung Pao", 32, 1936, pp. 305-313; **O. Baldacci**, in: **G. Melis** (ed.), *Martino Martini, geografo*, pp. 60-66.

34. Martini's coordinates are indicated on his maps, and within the text on 19 unnumbered pages following p. 171. An interesting comparison between the coordinates on Chinese maps, these by **M. Ricci** and by **M. Martini** is made in the dissertation of **L. Vanderpooten**, *Martino Martini's Novus Atlas Sinensis*, Leuven, 1985. See also **O. Baldacci** and **G. Staluppi**, in: **G. Melis** (ed.), *Martino Martini, geografo*, pp. 68-70 and 141 resp.

35. See on these points the Introduction; cfr. **H. Walravens**, *China Illustrata* (cf. n. 14), pp. 112-113.

36. See the *Novus Atlas Sinensis*, Amstelodami 1655 (12 separately numbered pages), and **J.J.L. Duyvendak**, *Early Chinese Studies*, pp. 302-303.

37. On Boym's life and work see, apart from **L. Pfister**, *Notices*, I, spp. 269-277 and **J. Dehergne**, *Réportoire*, pp. 34-35 (nr. 107): **R. Chabrie**, *Michel Boym, jésuite polonais et la fin des Ming en Chine*, Paris, 1934, with the critics by **P. Pelliot**, in: "T' oung Pao", 31, 1935, pp. 95-150; the contributions of **B. Szczesniak**, esp. his *The writings of Michael Boym*, in: "Monumenta Serica", 14, 1949-1955 pp. 481-536; **E. Kajdanski**, *Michael Boym ostatni wyslannik dynstii Ming* ("M. Boym, The Last Envoy of the Ming Dynasty"), Warsaw, 1988 (cfr. "China Mission Studies (1550—1800) Bulletin", 10, 1988, pp. 69-71).

38. I.e. the *Sinarum Universalis Mappa* (copies in Rome and Paris), and a collection of 17 maps of the 15 provinces. plus one, preserved in the Bibliotheca Vaticana (F. Borgia Cinese 531): see **B. Szczesniak**, *The Atlas and geographic description of China: a manuscript of Michaël Boym (1612—1659)*, in: "Journal of the American Oriental Society", 73, 1953, pp. 65-77; id. *The Mappa Imperii Sinarum of Michael Boym*, in "Imago Mundi", 19, 1965, pp. 113-115.

39. See **B. Szczesniak**, *The Atlas*, pp. 72-74; *The Mappa*, 19, 1965, p. 113.

40. Roma, ARSI, JS 77, f° 33r. — 71r.

41. Chantilly, Fonds Brotier 118, f° 66—77 (copy); f° 78—80 (autograph).

42. **G. Riccioli**, *Geographiae et Hydrographiae Reformatae Libri XII*, Bononiae, 1661* 1, Venetiis, 1672* 2, pp. 315-316 and p. 306 resp.

43. Cf. on this *paradigma* a.o. **B. Szczesniak**, *The Seventeenth Century Maps*, pp. 130-133 and **TH. N. Foss** in: *East meets West* (cf. n. 1, p. 219).

44. **F. Verbiest**, *Astronomia Europae* (cf. n. 25), pp. 69-72.

45. Antwerp: Musaeum Plantin—Moretus, nr. 323 (now = M30), f° 17r. — 19v.

46. See **H. Josson, S.I. & L. Willaert, S.I.**, *Correspondance* (cf. n. 3), pp. 380-403 and pp. 422-435 resp.

47. The bibliography is collected by **R. Streit**, *Bibliotheca Missionum*, V. Rom-Freiburg-Wien, 1964², nr. 2504 and 2507, and by **H. Josson, S.I. & L. Willaert, S.I.**, *Correspondance*, pp. 380-381 and p. 422.

48. < Cum Imperator Tartaro-Sinicus Cam Hi, a Sinensibus et Tartaris secundum dimensa fune intervalla totam Chinam et Tartariam sibi subjectam in mappis sibi delineari curasset, postmodum cogitare coepit, eo quod crassis erroribus abundarent, de illis reformandis et

addendis gradibus longitudinis et latitudinis, qui in illis deerant. Consilium suum olim aperuit P. Ferdinando Verbiest incipiendi primo a regno Sinarum. Verum eo paulo post vita functo et superveniente bello Erutano contra Caldanum, admodum periculoso, nihil amplius Imperator de eo tractavit (. . .) > See the edition of this text by H. Bosmans, in "Annales de la Société Scientifique de Bruxelles", 46, 1926, pp. 160-161.

49. Cf. on this topic E. Bretschneider, *Early European Researches into the Flora of China*, in: "Journal of the North-China Branch of the Royal Asiatic Society", New Series, XV, 1880, pp. 1-37; 119-128.

50. Cf. J. González de Mendoza, *Historia de las cosas, ritos y costumbres del gran reyno de la China*, Antwerp, 1596 (for the botanical part in it, see E. Bretschneider, *Early European Researches*, p. 4); A. Semedo, *Relatione della Grande Monarchia della China*, Roma, 1643 (cf. E. Bretschneider, *ibidem*, pp. 4-7); M. Martini, *Novus Atlas* (cf. E. Bretschneider, *ibidem*, pp. 7-21).

51. See the reference in n. 14.

52. In 1619, he reports from Goa: < inveni *quinqentas plantas*, paucos pisces, quosdam lapides, paucas etiam serpentes, aves nullas, sic floh mir zuhoh; nunc in earum viribus labaro. Si mansissem hic integro anno procul dubio dedissem vobis mille plantas, omnes novas cena cum suis viribus >. After his arrival in China, however, the opportunities for scientific work in the field much decreased, a.o. by the restricted freedom of movement and by the linguistic problems. Yet in 1622, he disappointedly reports: < Hucusque nihil in naturalibus promovi: a nostris non possum, a Sinis non licet ob linguate ignorantiam . . . Curo iam aliquoties deferri aliquas herbas ex campo ut discam illarum nomen, sed nondum attigi *unam centuriam* . . . > (G. Gabrieli, *Giovanni Schreck Linceo* [cf. n. 14], p. 492 and p. 507 resp.).

53. Quoted by Gabrielli, *ibidem*, p. 484. The exclamation in this Chinese text, that it was < *peccato che questo erbario non sia stato tradotto* > (Italian translation from G. Gabrieli) is the only — implicit — indication that this work was composed in Latin.

54. The clearest source on this somewhat 'mysterious' text, though apparently not relying on personal knowledge, is found in A. Kircher, *China Illustrata*, Amstelodami, 1667, pp. 110-111:

< (. . .) **Indicam expeditionem petit, quam et haud magno labore obtinuit; et quemadmodum** Naturae arcanorum indefessum exploratorem semper se exhibuerat, ita modo opportunitate oblata, per vasta Oceani itinera, non more otiosorum aut dormientum, aut aliis occupationibus tempus terentium (ed. Terentium), nihil sive littorum promontoriorumque (ed. promontorium) naturalem institutionem ventorumque origines, sive maris pisciumque occurrentium proprietates spectes, inexploratum reliquit. In Indican vero delatus, *in campis sylvisque — erat enim herbariae rei peritissimus — nullum plantae genus obvium fuit, quod non quam exactissime examinatum in praeparatos a se prius chartaceos pugillares palimpsestosve una cum singularum figuris genuinis referret.* Hinc tolius Indiae, Bengalae, Malacae, Sumatrae, Concinnae (= Cocincinae) littoribus rebusque Naturae consideratione dignioribus exploratis, Macaum et inde Chinam tandem finem desideriorum sourum appulit, quam universam recto, transverso obliquoque itinere peragravit. Et quoniam innumera rerum in triplici Naturae Regno elucescentium arcana in peregrinis hujusmodi Coeli climatibus, in lapidibus, plantis, animalibus, hominumque moribus et institutis ei sese sistebant, *nil intactum reliquit, quod non examinaret, virtutesque singulorum philosophando experiretur, et uti erat pictoriae artis haud imperitus, singula propriis manibus ad vivum naturae prototypon delineata, magna Sinarum admiratione, duobus tomin ingentibus exhibebat, quem et Plinium Indicum, digno tanto opere titulo insignivit* > . The title *Plinius Indicus* is repeated on p. 120 as well.

55. The scanty evidence has been checked — without any success — by G. Gabrieli, who reports on it in: "Archeicon", 10, 1979, p. 242, and in *Giovanni Schreck Liceno*, pp. 483-486.

56. The same experience was expressed about 2 centuries later by E. Bretschneider, *Early European Researches*, p. 3: < travellers or naturalists of the present time, who are looked upon with suspicion, constantly watched and often molested by the people >.

57. See G.W. Leibniz in 1689, quoted in R. Widmaier (cf. n. 17), p. 8: < Habent patres ingentia volumina rerum Chinae naturalium ex Imperatoris archivio quae paulatim communicabunt Europaeis >.

58. Leibniz, *ibidem:* < Ne videatur ex Archivio descriptum. Metuendum enim est ne ea res ad Sinenses per Hollandos delata, suspiciones aboriantur. Itaque ad modum literarum ex provinciis scriptarum dabunt. Ibi pleraque de plantis, animalibus et lapidibus regni >.

59. According to B. Szczesniak, *The Atlas* (cf. n. 37), p. 76 (n. 63), the only 2 complete copies

are in Cracow (Bibl. Jagell.) and in London; other copies are listed by the same in *The Writings* (cf. n. 37), p. 492, n. 40. A recent description is given by H. Walravens, *China Illustrata*, p. 248 (nr. 190). A German translation of most of the text is presented *ibidem*, pp. 57-66.

60. This statement, made by B. Szczesniak, *The Writings*, p. 492 seems to be confirmed by F. Von Wartburg, *Fransözisches Etymologisches Wörterbuch*, III, Berlin 1934, s.v. flos, p. 673.

61. A French translation was published by M. Thevenot in his *Relations de divers voyages curieux* (. . .), vol. 2, Paris, 1664 (reprint, Paris 1674 and 1696).

62. It contains excerpts from the *Pen—ts'ao kang—mu* (1596), a herbal compiled by Li Shich—chen; Boym's copy of it is now in Berlin (Staatsbibliothek Preussischer Kulturbesitz), where it arrived through (Boyn — >) Cleyer — > Menzel: B. Szczesniak, *The Atlas*, p. 76 (n. 62).

63. See H. Walravens, *Eine Anmerkung zu Michael Boyms Flora Sinensis (1656)—Einer wichtigen naturhistorischen Quelle*, in: "China Mission Studies (1550—1800) Bulletin", I, 1979, pp. 16-20.

64. Another title: *Fructus et arbores qui in regnum Sinarum (. . .) reperiuntur, depicti cum brevi descriptione suarum proprietatum*, and attributed to M. Boym, is probably nothing but an inaccurate reference to the botanic part of the *Flora Sinensis*.

65. Cfr. on this topic E. Rochat de la Vallee, *La transmission de l' herbier chinoise en Europe au XVIIe siècle, in: Actes du 3ième coloque international de Sinologie*, Paris, 1983, pp. 177-192.

66. M. Martini, *Novus Atlas*, p. 7: < In medica arte, si praxim spectes, nos omnino superant >.

67. Cfr. D. de Navarrete in 1659 in: J.S. Cummins (ed.), *The Travels and Controversie of Friar Domingo Navarrete, 1618—1686*, Cambridge, 1962, p. 156: < Father Coplet (sic) is a passionate assertor of the Chinese Physicians, and here and there one is of his opinion; he is about translating some of their Books for the improvement of Europe >.

68. Cfr. H. Cordier, *Bibliotheca Sinica*, vol. 2, Paris 1905—1906[2] [Taipei, 1966] , col. 1470—1471; H. Walravens, *China Illustrata*, pp. 260-262 (nr. 204). The ms. is preserved in Berlin, Staatsbibliothek Preussischer Kulturbesitz.

69. The titles on the title—page are:

(I) De pulsibus libros iv è Sinico translatos.
(II) Tractactus de pulsibus ab erudito Europaeo collectos
(III) Fragmentum operis medici ibidem ab erudito Europaeo conscripti.
(IV) Excerpta literis eruditi Europaei in China.
(V) Schemata ad meliorem praecedentium intelligentiam.
(VI) De indiciis morborum ex linguae coloribus & affectionibus.

In fact. they constitute 4 independently paginated parts.

A complete listing of the separate sub—titles is given by B. Szczesniak, *The Writings* (cf. n. 37), pp. 508-513. This listing of titles and chapters is in accordance with the composition of the copy in Paris (BNP, Td. 16.19), but the copy which I inspected in the Ecole Sainte-Geneviève (T4° 312; Inv. 744 Rés). gives the same pieces in a totally different sequence, as the copy in the British Library (54. c. 26) does (described by E. Kajdanski, *Michael Boym's Medicus Sinicus* (cf. n. 70), p. 168.

70. Cfr. H. Cordier, *Bibliotheca*, col. 1471; H. Walravens, *China Illustrata*, pp. 262-265 (nr. 205).

71. P. Pelliot, *Michael Boym*, in: "T' oung Pao" 31, 1935, pp. 95-15r.

72. See M.D. Grmek, *Les reflets de la sphygmologie chinoise dans la médecine occidentale*, in: "La Biologie Médicale", 51, 1962 ("Numéro hors série"), *pp. LIX., and J.* Needham, *Celestial Lancets. A History and Rationale of Accupuncture and and Moxa*, Cambridge, 1980, p. 285 ff.

73. See E. Kajdanski, *Michael Boym's Medicus Sinicus*, in "T' oung Pao" 73, 1987, pp. 161-189.

74. Cfr. the impressive editorial 'program' of the author, published during his sojourn in Europe and mentioned a.o. by B. Szczesniak, *The Writings*, p. 486: < VI. Medicus Sinicus seu singularis ars explorandi pulsuum & praedicendi & futura symptomata, & affectiones aegrotantium a multis ante Christum soeculis tradita, & apud Sinas conservata. Quae quidem ars omnino est admirabilis & ab Europaea divisa > .

75. This title is mentioned in the *Clavis Medica*, pp. 10-12; 13; 14 etc.

76. Other Chinese authors explicitly mentioned are (in the original transcription):

Kie Ku (p. 17, 25, 39 etc.);
Pie Ko (p. 41);
Chum Kim (p. 17, 18 etc.);
Yum Ki (p. 31);
Se Veu (p. 28).

An unidentified < mandarinus medicorum Christianus > is the source of the 16 page—long *Tractatus de indiciis morborum ex linguae coloribus et affectionibus.*

77. So **M.D. Grmek**, *Les reflects de la sphygmologie*, p. LXXVI.

78. Copies of two Latin letters (a third apparently is lost), dated 29 June 1682 (< Ex mare Sinarum >) and 7 October 1685 have survived; they are now deposited with the archives of the Paris Jesuit Province in Chantilly (Fonds Brotier, 117, f° 49; 50—57 and 58—63 respon.). The original of fhe first letter was in the papers of the Duchess d' Aveiro, and is now in the Tenri University (Japan): see the photographic edition in *The Far Eastern Catholic Missions 1663—1711. The original Papers of the Duchess d' Aveiro*, Tokyo 1975, vol. II, pp. 3-36. For a comment on these letters, cfr. **H. Bosmans**, *L' oeuvre scientifique d' Antoine Thomas de Namur, S.J. (1644—1709)*, in "Annales de la Société Scientifique de Bruxelles", 44, 1924-1925, pp. 179-208.

79. The *Litterae ad P. Athanasium Kircher, in quibus plures observationes magneticae adnotantur* are signalized by **L. Pfister**, *Notices*, I, p. 262; **H. Bernard**, *Les sources mongoles* (cf. n. 30), pp. 135-136 refers to some letters of 1639—1640, quoted by **A. Kircher**, *Magnes sive de arte magnetica*, Coloniae Agrippinae 1643[2] (pp. 316—317 and) pp. 348-350, and by **G. Riccioli**, *Geographiae et Hydrographiae liber VIII*, pp. 348a-348b; the last one is also quoted by **B. Szczesniak**, *A Note on the Studies of Longitudes made by M. Martini, A. Kircher* and *J.N. Delisle from the Observations of Travellers to the Far East*, in: "Imago Mundi", 15, 1960, pp. 89-93, esp. pp. 89, the former by the same, *ibidem*, p. 91; still other items, dating back from 1640 and 1642, are preserved in Kircher's correspondence, according to **J. Wicki**, Die *'Miscellanea Epistolarum' des P. Athanasius Kircher S.J. in missionarischer Sicht*, in "Euntes Docete", 21, 1968, pp. 240-241.

80. A short evaluation of this work is given by **B. Szczesniak**, *Athanasius Kircher's China Illustrata*, in "Osiris", 10, 1952, pp. 385-411.

81. See on the development of this topic: **F. D' Arelli**, *P. Matteo Ricci S.J.: le 'cose absurde' dell' astronomia cinese. Genesi, eredità ed influsso di un convincimento tra i sceoli XVI—XVII*, in: *Dall'Europa alla Cina: contributi per una storia dell' astronomia*, a cura di **I. Iannaccone** e **A. Tamburello**, Napoli, 1990, pp. 85-123.

82. For a partial publication, see **F. Rodriguez**, *Jesuitas Portugueses astronomos na China (1583—1805)*, Porto, 1925, pp. 83-125.