

ABOUT WOOTZ - THE QUESTION OF HINDUWANI / ONDANIQUE

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It is difficult to understand that '*ondanique*', which refers to '*acier qui a des ondes*' (i.e. wavy steel) could be derived from '*hindwani*', which means '*steel from India*'. On one part, a technical point of view concerns the metallographic aspect of the product and, on the other part a geographical origin is clearly used. These two distinct criteria must not be agglomerated *a priori* without a precise discussion. A finer analysis is proposed.

Keywords: Chardin, Crucible steel, *Hindwani*, *Ondanique*, Marco Polo, Tavernier, Wootz

INTRODUCTION

The word *ondanique* in the Book of Marco Polo is considered as a name for a special kind of steel, which will be later related to wootz . It has been considered for a century as a corruption of *hinduwani* / *hindwani* by Yule^{1,2a}. *Hindwani* means: 'from India'³. For Kahane, '*indanikos sideros*', in Byzantine Greek, would come from the Persian *hindwani*, and *indanikos* would have given *andanicum* in 'Frankish' language⁴. However, this discussion is largely incomplete, because (i) *ondanique* is not the only word used to qualify this steel in the multiple versions of the Book of Marco Polo, and (ii) it is necessary to enlarge the linguistic discussion by considering technical criteria and making a difference between metallurgical and geographical aspects.

The Book of Marco Polo⁺ was written in 1298 by Rusticello of Pisa, in old French charged with Pisa Italian words. Rusticello and Marco Polo (who

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was a Venetian) were in the same jail in Genoa, during a war between Venice and Genoa. Rusticello was an author who had already written a Court Romance in French for the King of England (Edward I). In the 13th century, French was the most important language in Europe (intro. p.LXXXII)^{2b}. In a few months after the publication of the first copy of Marco Polo (there was no printing, only hand writing), many copies and translations in Italian dialects, Latin and French appeared, with many corrections and adaptations brought by the copyists and translator-copyists.

Two manuscripts of the Book of Marco Polo are kept in the French National Library of Paris (BNF) : ms.fr.1116 et ms.fr.5631. The first one was edited in 1824 by Roux^{2c} and the second in 1865 by Pauthier^{2b}. Both manuscripts, in Old French, are today considered by the specialists of Marco Polo as two ‘original copies’, but it is quite impossible to say which is the ‘most original’, because their contents are very similar^{2d}.

ONDANIQUE / ANDAINE

The chapter concerning the ‘Kingdom of Kerman’ in Persia, a title used in the English translation of Marco Polo by Yule^{2a} is the most informative for the present subject, even if only a few words are concerned. In Chapter XVII of the Yule’s edition, one can read:

“Kerman is a kingdom ... in Persia ... In this kingdom are produced the stones called turquoises ... There are also plenty of veins of steel and *ondanique* ... The people are very skilful in making harness of war; their saddles, bridles, spurs, swords, bows, quivers, and arms of every kind, are very well made indeed according to the fashion of those parts”.

The old French versions speak of: ‘Royaume de Creman’ (i.e. Kerman), and the special steel appears under two different names: *ondanique* and *andaine*. In Pauthier’s edition^{2b}, you find in chap. XXXIV: ‘*Ci dist du royaume de Creman*’ : ‘... vaines *d’acier et d’andaine* ...’, and in chap. XXXVIII: ‘*Cité de Cabanant...*’, ‘... *fer et acier et andaine* ...’, when the Roux’s edition gives in chap. XXXV: ‘*acer et ondanique*’, and in chap. XXXIX: ‘*fer et acer et ondanique*’⁺⁺.

This special material is now recognised as a kind of steel, even if non-metallurgist authors until the 19th century have proposed that it could be tin or brass or antimony or what else. Clearly, for Marco Polo and for his translators

and copyists, ‘steel’ on one part and ‘*ondanique* / *andaine*’ on the other part, were two different metallurgical species, close from each other, but distinct.

English speaking scholars consider that ‘*ondanique*’ is a corruption of *hindwani*^{1,3} when ‘*andaine*’ is generally not quoted by them. A reason is that the English translation by Yule^{2a} comes from the Roux’s edition, and consequently the word ‘*ondanique*’ is found in English publications, when ‘*andaine*’ and its derivatives are preferentially found in French and Latin mediaevalist publications, in parallel with *ondanique*.

The multiple translations of Marco Polo in the 14th century, in Italian dialects (Venetian, Pisan, Tuscan, Abruzzi, etc.), French, Latin, Spanish, Portuguese, etc.^{2b, 5}, propose many different terms derived from *ondanique* and *andaine*, which we gather and discuss below.

The main proposal for our discussion is based on the following statement: it seems unfounded to consider that ‘*ondanique*’ understood as ‘*acier qui a des ondes*’ and ‘*pulad jauherder*’ (i.e. wavy steel) by Chardin a few centuries later⁶ could be derived from ‘*hindwani*’, which means ‘from India’. On one part, we have a technical point of view concerning the aspect of the product and, on the other part, a geographical origin. Here is the precise point on which a new light must be thrown by taking into account the important role of the copyists in the story of the Book of Marco Polo.

ANALYSIS METHOD

First, it is necessary to establish a detailed list of words used to name this steel and to put them in different classes. Then, the intellectual behaviour of the copyists must be taken into account because they transformed the words, which they could not understand or that they considered as mistakes made by a preceding copyist. Simultaneously, we must consider separately the two following technical criteria, (i) metallographic on the aspect of the metal and (ii) geographical on its possible origin, with a precise constraint: no confusion or superposition of the criteria.

Remark: Many metallurgists have in mind the long tradition of calling iron and steel by the shape or the aspect of the product (blister steel, black steel, bar steels, Spiegeleisen, ...) or by its origin (generally a local name, but Swedish iron and Styrian steel were internationally known). International standardization founded

on chemical analysis and mechanical testing started only at the beginning of the 20th century

LIST OF WORDS

A. Type I : words looking like adjectives

Type I.1. *Ondanique*^{2a p.XXXIX, 2c, 7}; *ondanque*^{2c p.LX, 7}; *undanique*^{2c, 2e, 7}. For *ondanique*, *ondanque* and *undanique*, Godefroy⁷ refers to *andaine*.

Type I.2. *Andanico*, *andànic*’, *andanica*, *andanicho*, *andranico*, *andranego*⁵ and in Latin, *andanicum*, associated in the Ducange glossary to *chalybs* (steel)⁸: ‘*chalybdem* and *andanicum*’. From Kahane⁴, *andanicum* would be a ‘Frankish’ word coming from ‘*indanikos sideros*’ in Byzantine Greek.

Type I.3. *Indònaco*⁵ and *indanikos* (*sideros*)⁴.

B. Type II : words looking like substantives

Andaine^{2b}; *andanie* and *andine*^{2d, glossary}; *andena*⁹; for *undain*, Godefroy⁷ refers to *andaine*.

C. Words included in a phrase

The words below quoted in the Italian “*Tesoro*”⁵ are from the 13th and 14th centuries: ... *acciaio andanico*; *ferro andanico*; ... *andanico* di generazione di *ferro indico*; ...la lingua *andanica* (here, it is the hardness of the language which is qualified); ... *più* for *duri k’acciaio indònaco*; ...*punte fabricate a ferro andranico*.

French origin: *acier ondé*, *acier qui a des ondes*⁶ (i.e. wavy steel), translation of the Persian “*pulad jauherder*”; *fer d’andaine*⁷.

D. Direct reference to India

Al-hind, *alhinde*, *alfinde*, these words were transported by the Arabs into Spain during the eight centuries of domination of the Emirs on Al-Andalous¹⁰; *indanikos sideros*⁴; *ferro indico*, *acciaio indònaco*⁵; *spata India*, *spata indica*¹¹; *hindwani*, *hinduwani*, *hundwaniy*, which are Persian or Indian words^{2a, 3}.

Summary on the List

We can see that the adjectives (type I) have ending with: -ique, -icum, -ico, -ikos, ... (depending of the language) and the corresponding radicals are: ondan-, undan-, andan-, indan-. 'Andan-' is the same root as in the substantives (type II): andaine, andanie, andine, andena. Between these last four nouns, there are only small variations by displacement or suppression of a vowel, a small modification that could be attributed to ordinary hand copy mistakes⁺⁺⁺.

Importance of the copyist's choice: In the same manner as none of the two manuscripts of the BNF has to be considered the 'first original' one^{2d}, none of the above quoted words is *the true original* one. The copyists, as a function of their own culture, modify and/or correct the text, sometimes adding new information of their own^{2d}. They could make different personal choices, for instance:

- A technical choice from the aspect of the metal will give: *onde-* "qui a des ondes", related to *unda-* in Latin, and equivalent to '*jauherder*' in Persian, as said by Chardin⁶. It means: "wavy steel" in English.
- A choice of a geographical origin would give: *indan-* (India).
- An uncertainty about *andan-*, can lead to several proposals. (i) In the Tesoro⁵, *andanico* / *andanicum* is tentatively related to Andania, a town of Messenia in the south of Greece. (ii) Yule asked the question of a possible relation with the Forest of Andaine in Normandy (France)^{2a}. The phrase "fer d'andaine" (iron from Andaine) given by the Godefroy dictionary⁷, would find by this way a simple domestic signification. (iii) We propose also to consider as a candidate, Andanis, a region and a river near Ormuz Strait, an ancient commercial place situated in the south of the Kerman province of Persia¹². Marco Polo visited this region, but unfortunately no mention of Andanis can be found in his book. There are no demonstrations in the three above proposals. Moreover, (iv) which relation might be found with *andan/andoun/tchandan*, meaning "steel" in some Caucasian languages¹³? They could have been assimilated from the languages of foreign traders or warriors. However, the South Caucasus has long been thought (by Europeans) to be the birthplace of iron preparation, in the Armenia Mounts: the "Chalybdos iron" has been well known since Herodotus (8th-7th century BC), *chalybdos* being an ancient name for steel¹⁴. However, such a coincidence is not a demonstration. Another possible track would be the "Adana gulf" in Turkey, etc. The list could easily grow longer.

- ** Finally, *Andanie coming from hindwani* seems to be the most convincing choice, when you pronounce ‘andanie’ with a French accent.
- ** *Adjective formation from the radical andan-* coming from the noun ‘andanie’. Quite generally, the names given to ‘steel’ describe a particular property of an iron base metal¹⁵. For instance, *acies*, *steel* and *stahl* (radical *sta-*), etc. are adjectives meaning: cutting or resistant. The word ‘iron’ has generally disappeared and the adjective became the name of a new product. Following the ancient lexical tradition, the copyist is able to transform ‘andaine’ into ‘andanique’, with the ellipse of ‘iron’ in a supposed ‘andanique iron’ or ‘andanicum ferrum’, in Latin. Yule (2a, XVII, n.3, rem.1) addressed the same question about ‘hundwanij’. He supposed a word to be apposed to what he considered as an adjective: ‘... *some word for steel being wanted*’. However, Feuerbach and her coauthors have proposed a simple explanation for *hinduwani/hindwani*: *-wani* would mean ‘steel’ and *hind-* refers to ‘India’³.

CONCLUDING REMARKS

Clearly, *ondanique*, which describes the wavy aspect of the metal’s microstructure cannot derive from *hindwani*. *Ondanique* refers to a metal ‘*qui a des ondes*’ as written by Chardin⁶, that is ‘*pulad jauherder*’. *Hindwani* means : *steel from India*³, called ‘steel from Golconda’ by Tavernier¹⁶. The closest word to ‘hindwani’ seems to be ‘andanie’ a parent of ‘andaine’, the signification of which would then be geographic and related to India.

The series of adjectives ‘*ondanique, undanique, ond , wavy*’ describes a metallographic aspect, related to ‘*jauherder*’. The nouns ‘*andanie, andaine*’ refers to India. The series ‘*andanic, andanicum, andanique, ...*’ is the result of adjective formation from ‘*andanie or andaine*’ to represent the ‘*fer d’andaine*’ (iron from andanie) that is : ‘*andanic iron*’, a phrase simply transformed into the adjective ‘*andanic*’, as it has been current for steel in many languages¹⁵.

Apart from the linguistic debate, it is well admitted that all these different terms describe the same product that is a special iron base alloy. Without doubt, it is a crucible steel, because a metallographic description is given by ‘*ondanique*’ (wavy) and this steel is related to India (andanie/hindwani) as confirmed several centuries later by Chardin⁶ and Tavernier¹⁶. It is clear that the above discussion

is not complete because European publications have been only used as was done in a previous paper¹⁷. This choice was justified by the fact that the Book of Marco Polo was originally written in French. However, with further reference to Arab and Indian sources, it is clear that new examination must be necessary.

NOTES

- + The original title is : ‘*Livre de Marco Polo*’. Other titles are commonly used: *Voyages de Marco Polo* (Travels of Marco Polo), *Devisement du Monde* (Description of the World), *Livre des Merveilles* (Book of Wonders), *Il Milione* (the Million).
- ++ Translation: in Pauthier’s chap XXXIV: ‘...veins of steel and andaine...’ and in chap XXXVIII : ‘... iron and steel and andaine ...’. In Roux’s, *acer* is steel and *fer* is iron.
- +++ *Modern example of copying error*. A research with Google on the word *undanique*, led me to the Aeneid of Virgil (1^{er} century BC, book VII, verse 231). The photocopy seemed to show *undanique*, but with some vision trouble. In a real approach of the text, you must replace **ni** by **m**, that is *undanique* by *undamque* (or *undam-que*), where *undam* is the Latin accusative of *unda* (*onde* in French = wave in English), and *que* at the end of *undam* is a coordination conjunction. The Latin text gives: ‘... *cunctis undamque auramque patentem*’, which means: ‘... and water (wave) and (blowing) air offered to everybody’, nothing to do with steel!. Here we find a first inaccuracy in the photocopy, followed by a mistake of the word-processing software. Each era finds its particular copyist errors!

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