

CISTERIAN WATER SYSTEMS AND THEIR SIGNIFICANCE FOR SHAPING LANDSCAPE

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ABSTRACT

Locating monasteries in river valleys with a considerable tributary system is regarded to be one of the rules for establishing Cistercian foundations: *Bernardus valles, colles Benedictus amabat, Franciscus vicos, magnas Dominicus urbes*. A river valley provided opportunity for spatial development and land cultivation on fertile ground, something that Cistercian monks specialized in. In their efforts to raise effectiveness of their production, they did not underestimate the importance of water, not only by developing their fishing ponds, but also making water the main driving force for water mills and fulling mills, thereby promoting modern rural 'food' industry such as distilleries, breweries and open-pan salt production. In today's post-cistercian landscape, in spite of many centuries of economic landscape exploitation, we can still discover properly functioning natural systems and traces of comprehensively developed water systems. Using the solutions utilized in monasteries all around Europe, the Order managed to enrich and shape landscape in a very considerable and unique way, not only on economic and social, but ecological level, too.

Keywords: Cistercians, monastery, valley, water management, cultural landscape

INTRODUCTION – CISTERCIANS AND THEIR ROLE IN THE DEVELOPMENT OF EUROPE'S LANDSCAPES

Initially, the Cistercian order was called the New Monastery – *Novum monasterium*, but since 1119 it was named after the place, where the monastery was built – Cîteaux, becoming the birthplace of the largest reformed contemplative order in the Middle Ages (see: Fig. 1). Within a few years Cîteaux had set up four subordinate monasteries (proto-abbeys): Pontigny, Clairvaux, Morimond and La Ferte, which soon began the actual operation of setting up new, auxiliary monastic houses. The order grew rapidly, covering areas from Portugal to Sweden, from Ireland to Estonia and from Scotland to Sicily – in 1342 the number of abbeys has grown to over seven hundred [Lawrence 2005]. Such a large scale was related to systematic and comprehensive transformation of landscapes belonging to the

Cistercians – today the phenomenon is referred to as *melioratio terrae*.

St. Bernard of Clairvaux, who made a huge influence on the congregation by giving it an ideological direction, is considered one of the most important Cistercians. The Clairvaux Abbey, of which he was the first abbot, and Morimond Abbey (Burgundy) were both founded in 1115. They are also the mothers of twenty-six Cistercian abbeys located in today's Poland, four of which, it is worth mentioning, (Jędrzejów, Sulejów, Wąchock and Koprzywnica) are direct branches of Morimond. Thus, there are some interesting analogies in spatial development, including the use of water conditions and their shaping.

Among other great contributions, the Cistercian order introduced new types of farming and land management systems that had a direct impact on remaining undeveloped areas. Cistercians also have

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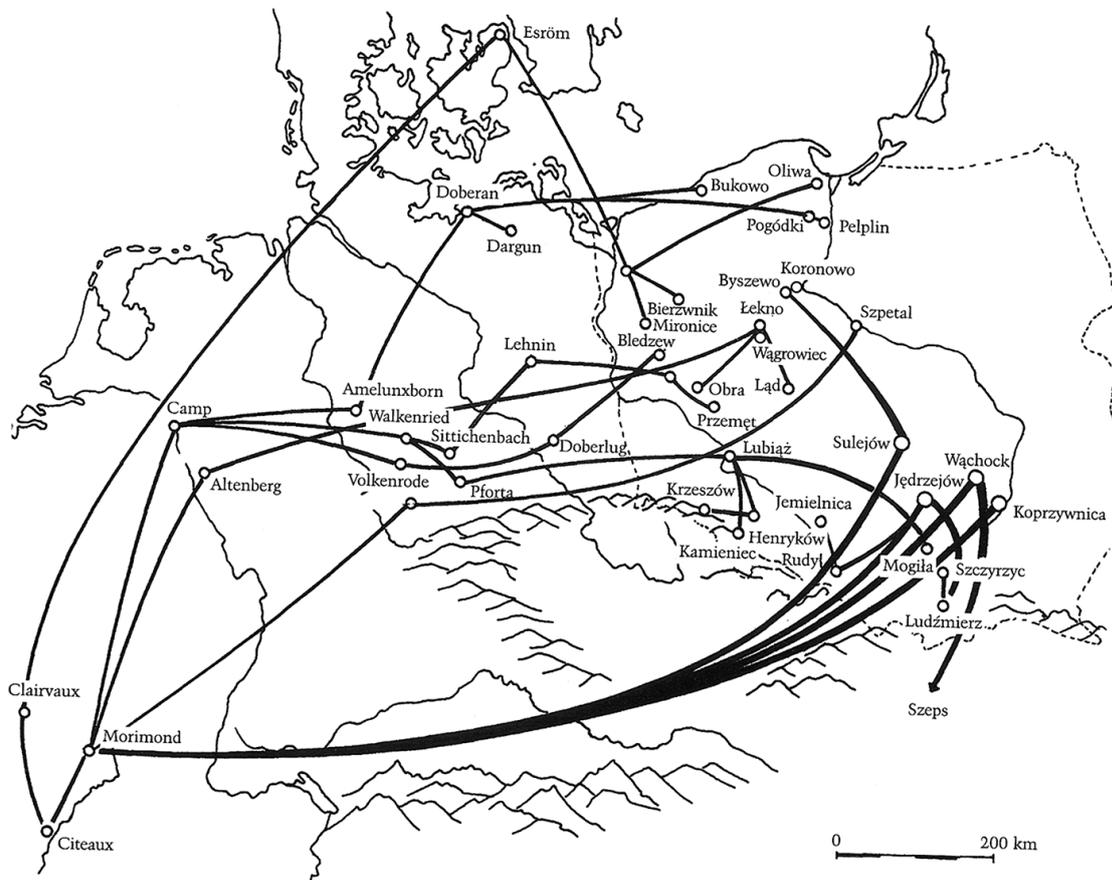


Fig. 1. Filiation paths of Polish Cistercians (author's copy based on J. Zachwatowicz and A.M. Wyrwa)¹

created new rules for development of agricultural areas, which usually were located in river valleys or in their close vicinity. One of the monastic rules says that monk has to live by the work of his own hands, thus Cistercians had set up farms up to 3,000 hectares large (*grangie*), where they grew various kinds of grains, bred cattle and sheep (usually with lay brothers – *conversi*). They efficiently colonised wastelands, forests and wetlands. As a feudal order, they knew the benefits of planned farming and water management (of streams, rivers, and even wetlands). To improve production efficiency they recognised the significance of water by not only intensifying pond management, but also making water the main driving force for mechanical devices, like mills, and so virtually created the modern rural food industry, including

distillery, brewing and salt production (all based on water energy). Traces of this development, sometimes of forgotten historical origin, disappear today, giving way to new forms and functions, completely losing old traditions and values. Consequently, destroying relics of the historical solutions that bear witness to medieval landscape heritage and important elements of European history. Patterns brought to Poland by the Cistercians always had their source in mother abbeys, not least due to the exchange of experiences during the meetings of a chapter or mandatory visits to monasteries. Many documents prove that abbeys passed from one to another i.e. construction and investment experiences, causing analogies of technical solutions and landscaping according to unified program, known today as “Cistercian”.

¹ By: E. Łużyniecka et al. (2008), p.10.

MATERIALS AND METHODS

The paper includes an analysis of the existing and dissolved Cistercian (male) monasteries located in today's Poland, in terms of water conditions and preserving traces of past development in the context of natural richness of land. Aerial photography, topographic maps, materials on protected areas in Poland and own field research were used. An important element of the paper is a comparative analysis of Polish locations and French model solutions in Clairvaux and Morimond, which for centuries served as a kind of spatial development patterns, each time implemented in Cistercian monasteries with appropriate adaptation to environmental conditions. The presentation of these links shows, how still important for the study of landscape evolution are traces of spatial solutions originating in ideas of the Cistercian and how many areas (often of natural beauty) were affected by their planned management throughout the continent.

CISTERCIAN ON POLISH LANDS

The main reason for bringing over Cistercians in 12th century to lands in need for agricultural development and general management J. Kłoczowski (2007) recognises in their ability to improve country's economy – he even points to the order's significant contribution in the authentic economic “jump” of Poland in the thirteenth century. Cistercians distinguished themselves by strong expansiveness, because after the first two abbeys in Łekno and Brzeźnica (Jędrzejów) were founded around 1150, in the years 1163–1198 seven great Cistercian monasteries were built: in Sulejów, Koprzywnica, Wąchock, Łąd, Lubiąż, Kołbacz and Oliwa. In the 13th century following group of abbeys was founded: Mogiła, Szczyrzyc, Pelplin, Koronowo, Paradyż, Henryków and Krzeszów (Kłoczowski 2000). From the 12th to the end of the 13th century within borders of today's Poland twenty six Cistercian abbeys of the male line were founded, and no more were built later. These monasteries come from two filial lines i.e. Morimond and Clairvaux, with only Kołbacz, Mironice, Bierzwnik and Oliwa are branches of Clairvaux, the others belong to the Morimond line (see: Fig. 1) (Wyrwa 1999).

Cistercians implemented their spatial utility program each time selecting a place by the river, sur-

rounded by forests, free from flood risk, but potentially with good water conditions. They would always integrate their architecture into the environment, expanding it over time – reshaping and improving the surroundings (Holeczko 1991). Situating an abbey in a river valley, with a fairly rich tributary system, often in the so-called valley gate, above inflow to a larger river, is considered the main rule of Cistercian locations. It allowed for spatial development and agricultural management based on fertile lands and the maximum use of water energy. The political and economic issues are worth mentioning here, regarding the fact of land granting by notable founders, who offered for settling the neglected, undeveloped or abandoned areas that required huge effort to transform them by the order into productive and profitable in future (Kinder 2002).

WATER MANAGEMENT IN THE CISTERCIAN MONASTERIES

The topographic analysis of abbeys shows that the Cistercians always adopted for their monasteries sites with foundations, so that in spite of direct location in the valley, they took a somewhat elevated place that prevented flooding. Often, these were local hill or small slopes. Church being the most important building was erected – if only conditions allowed it – in the highest place of the selected site for the location of the abbey, turning it towards the east (usually with slight deviations resulting from the topography). However, interestingly, the topographic analyses of these areas indicate that the Cistercians did not choose for the location of a monastery the highest available elevation, usually around the abbey's buildings there was a hill or a range of hills (shielding the monastery and towering above). Most likely when choosing a place such conditions as the valley's width, the river's direction and its current, as well as its availability and the ability to “tame” watercourse were more important.

Water demand in the monastery can be related to three categories: liturgical, utility and economic. Liturgy uses holy water. Utility purposes consist of water for consumption, hygiene and sewerage service. Usually, for these reasons there would be a fountain (lavabo) in the garth. It obviously provided fresh water, fit for consumption, either directly from groundwater

or from the closest spring. The shape of terrain determined how the pipeline (sometimes a few miles long) would be constructed and how the fountain would look like. The whole system could include buildings with wells, reservoirs and plants, tide gauges, water-gates and valves reducing pressure etc. And, it was obvious that it had to be designed and built before – or during – the construction of the abbey (Kinder 2002). Water for economic purposes propelled mills, forges and other technical devices, flowed through the entire system of canals in utility gardens. Because most of the land was used by the Cistercians for agricultural reasons, it required irrigation or drainage and providing the right amount of water for animals. In addition, they established fish farms, which were an essential component of a water management system, often extensive complexes of ponds were built to improve water management and keep fish – an important element of a monastery’s diet. Such a wide range of needs for water required an efficient supply and discharge system – usually there were two water systems. The first is an “external system”, providing water from the nearby river into a system of elevations and canals, in order to create a power capable of supplying mills and forges. Not only river would provide with water, but also would function as a sewer, where used water was drained from piping system surrounding a monastery and running beneath it. The second was an “internal system”, consisting of pipes distributing clean water throughout the monastery, flowing under pressure from a source located on the side of a valley. This involves a relatively complicated and extensive system of pipes and filters. It is worth adding that in many monasteries old “water management” systems are hidden deep under the layer of soil and vegetation (Milecka 2008, 2009).

Polish abbeys have not been covered by comprehensive research on water and sewerage systems yet, although individual archaeological studies carried out at particular sites also bring interesting discoveries as to their functioning. The most of the abbeys (i.a. Jędrzejów, Wąchock, Koprzywnica and Sulejów) are situated below the confirmed location of sources that under naturally generated pressure – due to level difference – could supply with water. Unfortunately,

these canals, because of open-trench form, are increasingly impossible to find – however, their traces can be spotted on the archival plans (Wąchock, Sulejów, Koprzywnica).

SPATIAL CONDITIONS OF CISTERCIAN MONASTERIES IN POLAND

In topographical terms Polish Cistercian abbeys were founded on plains or small hills adjacent to valleys or depressions caused by open waters, usually surrounded by vast wetlands or swamps. Clearly distinguishing itself is the monastery in Szczyrzyc – located in the mountainous terrain – though it also occupies a valley that enables the construction of ponds and maintaining economy typical for the order.

According to A.M. Wyrwa (1999), all abbeys were situated near primary and secondary trade routes. It should be noted in this context that in the Middle Ages and in the following centuries, rivers served as important “communication sequences”, and these as we know are connected with Cistercian abbeys (see: Fig. 2). Another worth noting evidence of imaginative and economically justified placement of monasteries is collecting customs on near crossings.

The analysis of the location of Cistercian abbeys in Poland prompts for classification in terms of their landscape, i.e. mountain (Szczyrzyc), upland (Mogiła, Rudy, Kamieniec Ząbkowicki, Jemielnica, Koprzywnica, Henryków, Jędrzejów, Krzeszów, Wąchock, Sulejów and Lubiąż) and lowland (Przemęt, Odra, Łą, Paradyż, Bledzew, Wągrowiec, Mironice, Bierzwnik, Koronowo, Kołbacz, Pelplin, Oliwa and Bukowo Morskie)². These studies combined with the analysis of spatial arrangements observed in the abbeys that stem from models in Clairvaux and Morimond, show the relationship between the location of an abbey in its surroundings and the directions of its development. It is important here to analyse the river valley, in which an abbey is located and to determine its width and features of its slopes (see: Fig. 3). Clairvaux – documented in rich iconography, at all its historical stages, and thus being a good example – is located in a valley with a very interesting water system, obviously developed by the Cistercians.

² The abbeys are listed by their location in regard to latitudes, from the south to the north.



Fig. 2. Cistercian monasteries in relation to Poland's water system (cross-shapes indicate monasteries preserved only in their relic form)

The valley, which in accordance with the Cistercian rule conceals the abbey, provides a noticeable climate – fairly high scarps directed the development of the abbey along an axis of a smaller watercourse, towards its estuary into the river Aube. This pattern of situating an abbey at the mouth a stream into a bigger river was clearly imitated in several Polish abbeys: Jemielnica, Lubiąż, Sulejów, Wąchock and Wągrowiec. Spatial development like that can be described as a sequential-radial, because it is determined by a course of a water flow, but remains rather unrestricted by the narrow valley, which in turn can be found in Morimond. Undoubtedly, such environment led to almost linear development of the abbey (outlined as sequential). The narrow valley of the Flambart River prevented any development of the riverbed, to for example

let it run in several streams, so it would supply all the necessary equipment. The only possible way to supply the entire canal system with enough water to power all of the various devices was to build an artificial dam accumulating large masses of water above the abbey. A similar situation is in Jędrzejów and Mogiła, but the idea of constructing dams above an abbey also can be found in Koprzywnica and Wąchock.

The situation of Polish abbeys was analysed on grounds of presented observations, including the water system and terrain, as two factors that significantly determined spatial development of Cistercian monasteries. In regard to natural character of the locations (mountain, upland, lowland), the situational sketches are presented in an order that includes the historical districts of Poland – mountain and upland sites are

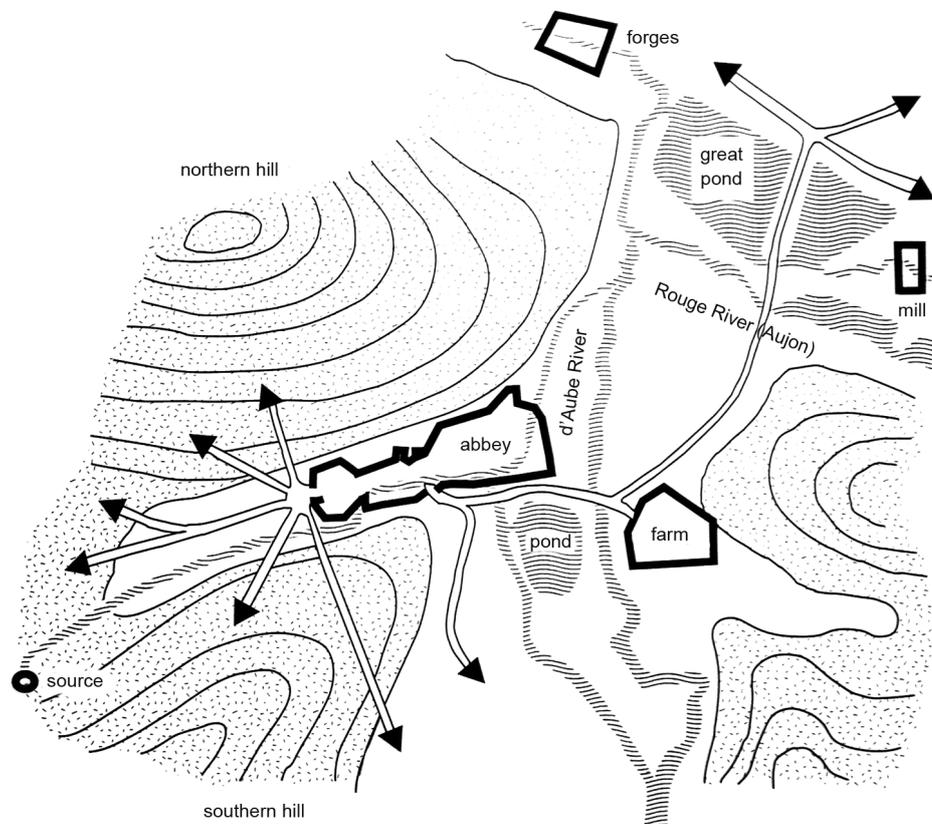


Fig. 3. Exemplary location of Clairvaux I (1115–1134) in relation to environmental conditions and road network (Clairvaux museum resources, copy by M. Milecka)

associated with abbeys in Lesser Poland and Silesia, whereas lowland sites with the Greater Poland's and the Pomeranian ones.

When drawing conclusions it needs to be pointed out that the Cistercians would attempt to locate the abbeys in mountain and upland areas on the edge of a valley, above the floodplains. The abbeys in Szczyrzyc and Wąchock (Lesser Poland) and in Henryków, Kamieniec and Lubiąż (Silesia) are situated on islands within the bottom of a valley. To prevent the mentioned abbeys from flooding, they were either set up on the valley's elevations or water system was developed circumferentially (e.g. the system of ponds in Wąchock). Lowland abbeys are situated very similarly to Cîteaux – usually it was difficult to clearly determine the valley's edge due to its significant flattening. When setting up an abbey in the bottom of a valley, it was important to place it as high as possible, but also

close to a river, like in: Przemęt, Paradyż, Bledzew. In all of the lowland sites to much greater degree, than in the upland sites, water systems were developed and reconstructed, guaranteeing on one hand the safest living conditions and on the other, the most efficient use of water energy, crucial to keep the abbey's economy. Relatively smaller differences in water retention levels that can be used in the lowlands needed numerous damming up devices and dividing the river's main stream into many courses.

THE SIGNIFICANCE OF CISTERCIANS IN SHAPING POLAND'S LANDSCAPE

In all cases, surroundings of the monasteries still manifest (though, to a various extent) elements of the Cistercian spatial development, with complex reshaping of the valleys, relics of fish ponds, gardens and forests

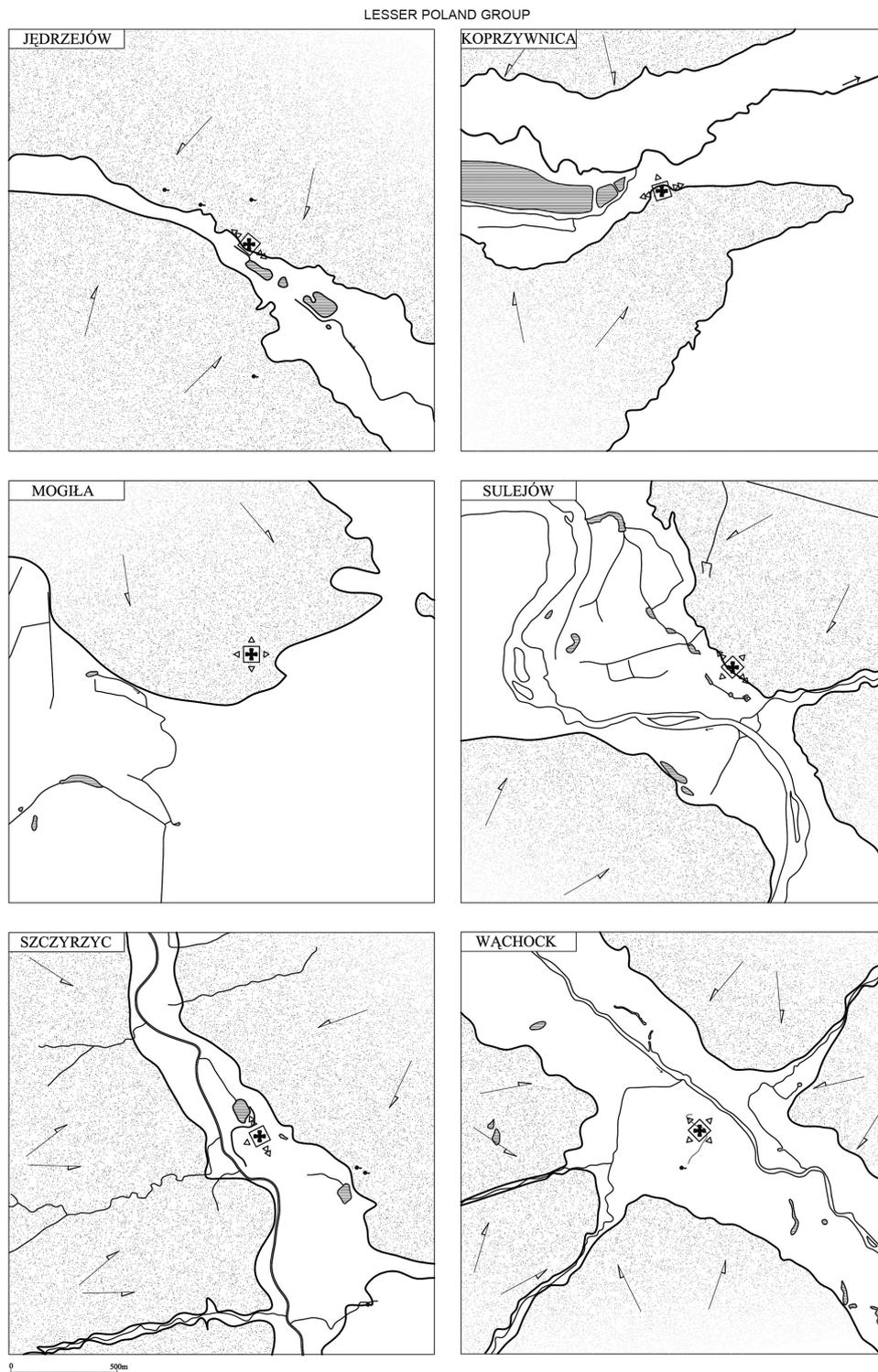


Fig. 4. Site plan of a location in the valley of monasteries of the Lesser Poland group (by Milecka 2009) (for explanations see: Fig. 7)

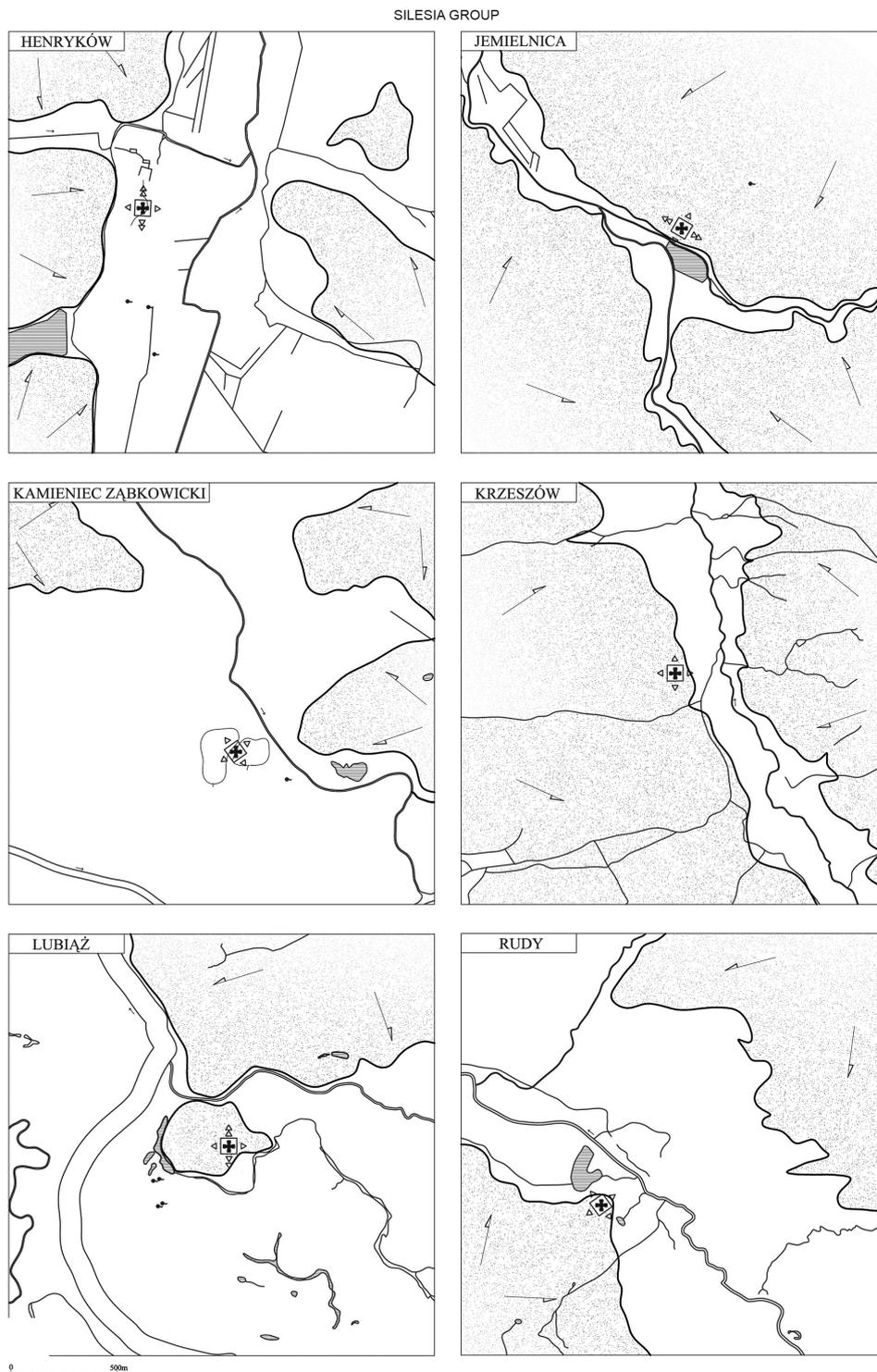


Fig. 5. Site plan of a location in the valley of monasteries of the Silesia group (by Milecka 2009) (for explanations see: Fig. 7)

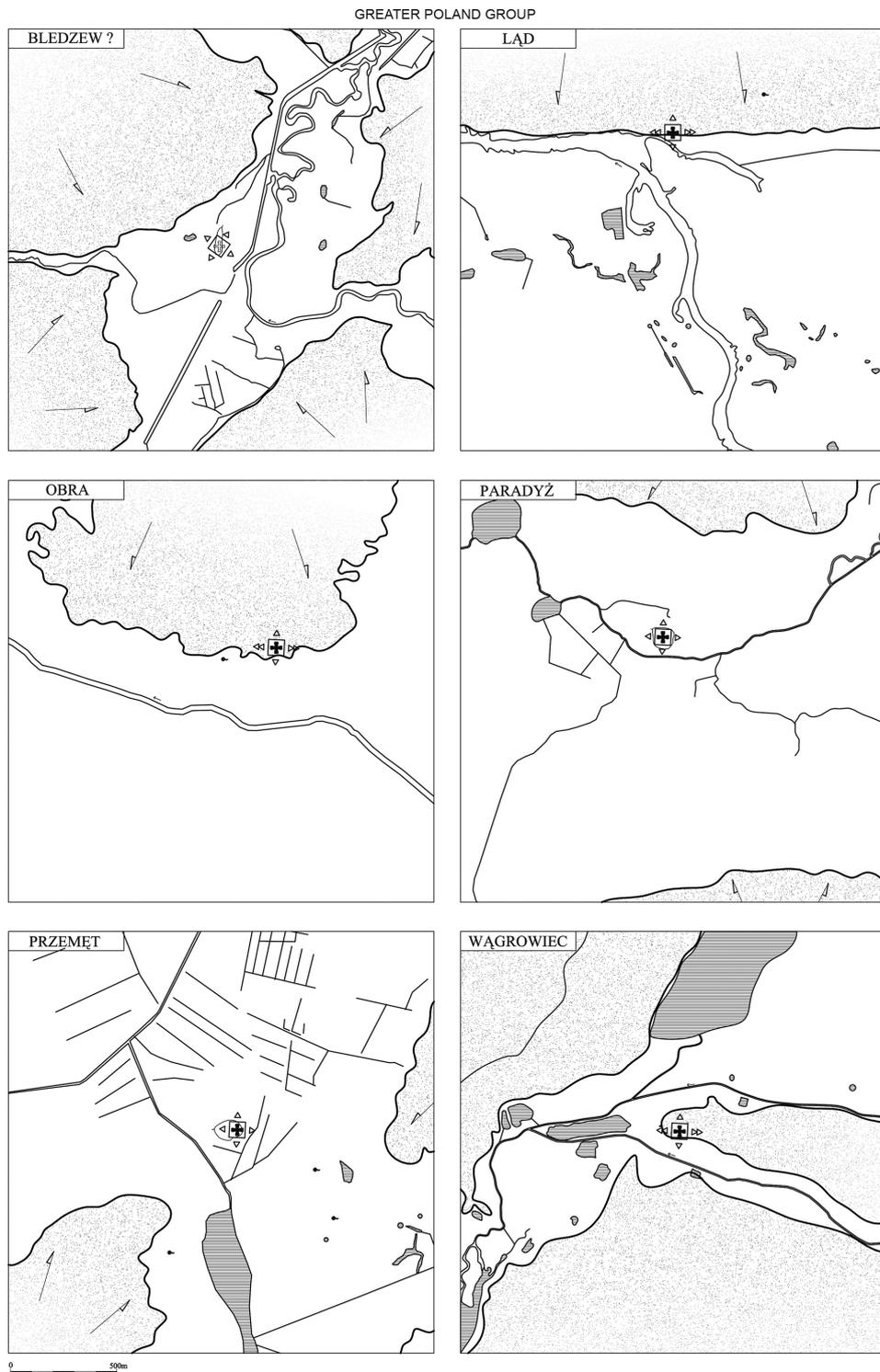


Fig. 6. Site plan of a location in the valley of monasteries of the Greater Poland group (by Milecka 2009) (for explanations see: Fig. 7)

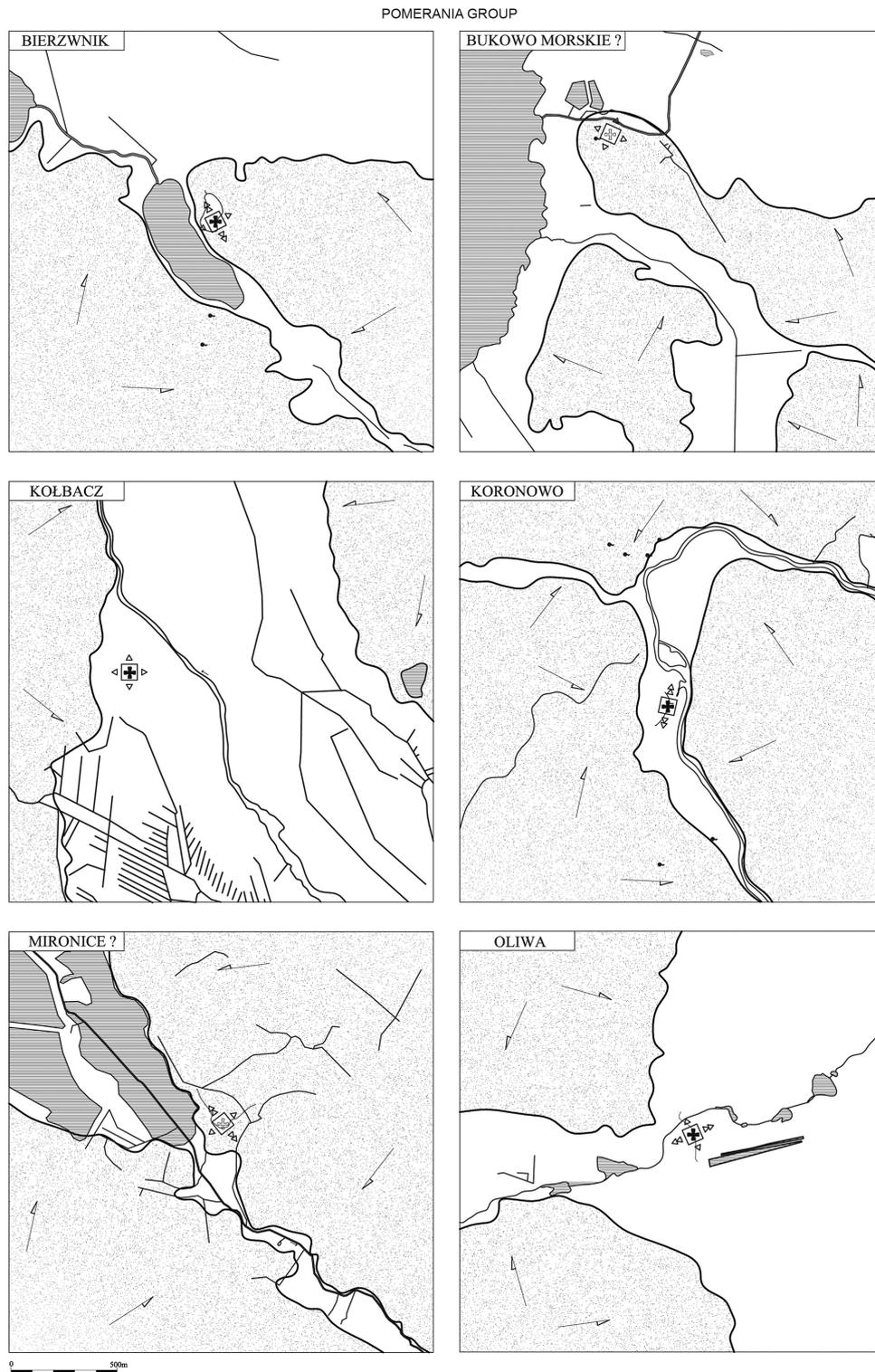


Fig. 7. Site plan of a location in the valley of monasteries of the Pomerania group (by Milecka 2009)

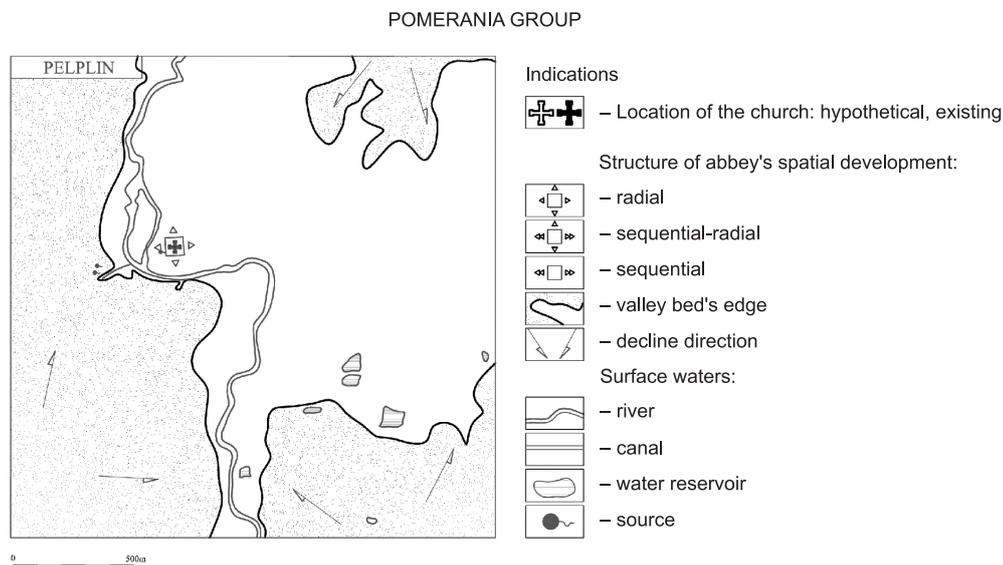


Fig. 7. cont.

– albeit moved away from abbey walls, but still discernible against the monasteries silhouettes. Unfortunately, as time passes, historical links between monasteries and their spatial surroundings are being erased as the increasing urbanization around them continues. The broadest valley areas undoubtedly accompany the abbeys situated in the least urbanized areas. The best preserved, complex water system (in many places still functioning) and picturesque location, far enough from modern scenery so the internal connections remain untouched, make the Cistercian spirit in the landscape felt very strongly. The most heart-wrenching is the “detachment” of an abbey from a river and isolating it from the valley, with which it was almost symbiotically joint for centuries. This is an effect of boundary changes of monastic complexes, urbanization and new forms of land management completely obliterating historical compositions.

The rationally run by the Cistercians economy from the end of the 12th century to the beginning of the 19th in all of the examined abbeys resulted in a consistently shaped cultural landscape and a good condition of natural environment. This is demonstrated by the analyses of protected natural areas in the vicinity of Cistercian abbeys throughout Poland. They show that in 21 cases (of preserved recognisable monasteries or just their relics) Cistercian abbeys are located with-

in extremely valuable natural areas under protection, or very near them, including 12 in areas under Natura 2000 (SOOS and OSOP) or in their vicinity. These are: Bierzwnik, Bukowo Morskie, Henryków, Kołbacz, Krzeszów, Łąd, Lubiąż, Mironice, Oliwa, Paradyż, Przemyśl, Sulejów.

A more in depth analysis of the protected areas' reach may lead to the conclusion that the policy in this regard should evolve towards the preservation of the entire natural systems, especially of those connected to valleys for a complex protection that does not remain on the level of isolated groups of vegetation with the highest biological potential. In this context, there is a surprising partial shortfall in protection of valley ecosystems of selected abbeys. This leads to a conclusion that work on correcting the extent of these areas and introducing protective forms that include the role of Cistercian abbeys in shaping of Polish landscape, as well as preparing legal provisions for protection of cultural landscape associated with them. At the moment, the most of the terrains, where visible relics of the Cistercian economy (green compositions, water systems, farms) still can be found outside of the areas listed on the monuments' registers, because of general lack of spatial development planning and lack of a comprehensive diagnosis of post-Cistercian cultural landscapes, is exposed to deterioration due to im-

proper use of terrain, erasing historical and sometimes very valuable spatial forms and related to them natural connections (that still function). Reparation of this situation should be undertaken as fast as possible if we want this precious cultural heritage to survive as “living” objects in beautiful surroundings, and not as isolated monuments of history. The problem are still flawed procedures for designing of spatial development plans that do not take into account the protection of historical landscapes.

SUMMARY

Analysing the locations of Cistercian abbeys against the background of natural conditions and implemented by the Cistercians spatial program, it is not difficult to get the impression that they still manifest the medieval Cistercian tradition. This program embodies the ideas of contemporary “ecological architecture” (Wines 2008, p. 65–67). A shortlist of basic principles of environment-friendly architecture includes recommendations, which are clearly realised in Cistercian monasteries; like for example:

- construction of smaller buildings – small-scale architectonic structures seem as a logical alternative to megastructures destructing the Earth and its natural resources,
- creating water storage systems and intelligent use of renewable energy sources,
- orientating the development towards the sun and taking into consideration the terrain and better heating, cooling and lighting conditions,
- use of construction materials and technologies that reduce problems with transport and processing of raw materials for facilities and reuse of existing buildings.

To understand the Cistercian philosophy of shaping space one should pay attention to the integration of architecture and landscape, and an issue of connecting buildings with a complementary spatial context. If we consider architecture as a record of man’s relationship with the environment and a testimony of his ideas, present in the landscape of Cistercian abbeys expression of symbolism of nature is an extremely important

message at the civilization level. This record in the modern landscape should be absolutely subject to protection and promotion, and it should also serve as an inspiration to formulate more environmentally-sound rules for developing valley landscape.

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CYSTERSKIE UKŁADY WODNE I ICH ZNACZENIE DLA KSZTAŁTOWANIA KRAJOBRAZU

ABSTRAKT

Usytuowanie opactwa w dolinie rzeki, z dość bogatym systemem dopływów uznaje się za zasadę lokacji cysterskich: *Bernardus valles, colles Benedictus amabat, Franciscus vicos, magnas Dominicus urbes* („Bernard kochał doliny, Benedykt zaś wzgórze, Franciszek miasteczka, Dominik wielkie miasta miłował”). Dolina dawała podstawę rozwoju przestrzennego i prowadzenia gospodarki rolnej w oparciu o żyzne tereny, a w tym specjalizowali się cystersi. W staraniach o podniesienie efektywności produkcji docenili znaczenie wody, nie tylko intensyfikując gospodarkę stawową, ale także czyniąc z wody główną siłę napędową dla urządzeń mechanicznych: młynów, foluszy itp., a więc praktycznie stworzyli nowoczesny wiejski „przemysł” spożywczy, z gorzelnictwem, browarnictwem i solowarstwem włącznie. Współcześnie w krajobrazie pocysterskim, pomimo wielowiekowego, gospodarczego wykorzystywania walorów środowiskowych wciąż jeszcze możemy odnajdywać właściwie funkcjonujące systemy przyrodnicze oraz ślady kompleksowo zagospodarowanych układów wodnych. Zakon poprzez rozwiązania stosowane w swoich dobrach na terenie całej Europy, nie tylko na poziomie gospodarczym i społecznym, ale także ekologicznym, w bardzo charakterystyczny i istotny sposób dokonał przebudowy krajobrazu, znacznie go wzbogacając.

Słowa kluczowe: cystersi, opactwo, dolina, gospodarka wodna, krajobraz kulturowy