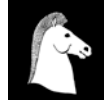




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# Engineering Miracles: Water Control, Conversion and the Creation of a Religious Landscape in the Medieval Ardennes

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## ABSTRACT

Though sometimes at odds, the religious and economic identities of medieval monks could also reinforce one another. Benedictine monks throughout the medieval world engaged in the economic transformation of the world while also seeking to flee many kinds of secular involvement. In the early and high Middle Ages, the monks of the Ardennes actively worked to reconcile this by constructing a religious framework for their practical activities. They controlled, managed and engineered water resources, and created miracle stories that highlighted these activities. Medieval monks had cultural and religious reasons for creating stories about water control, and religious stories need a firmer place in discussions of environment and technology. This article demonstrates that monks were able to use their religious authority and their control of religious message to support and supplement their temporal powers. The control of water resources was more than an economic or practical necessity; it was deeply connected to monastic identity and the relationships between monks and the secular world.

## KEYWORDS

Mediaeval environment, monasticism, hagiography, water management

Medieval monks often represented themselves and others as converting the landscape itself as part of their religious mission. One of the best-known expressions of this is tree-chopping missionaries piously destroying sacred trees or pagan groves. This became a standard image and represented both the transformation of nature and the conversion of pagans to Christianity through monastic and saintly intervention. Yet this is not the only way that nature was tied to monastic mission. The stories from religious communities in the Ardennes provide a good example of this because despite monastic forest clearance and the ubiquity of trees in the landscape, they did not emphasise the felling of pagan groves. Instead, their stories described the conversion of water sources.

The legends about the foundation of Stavelot-Malmedy, for example, describe how Remacle, a seventh-century bishop, missionary and monk, built his monastery on a former pagan cult site. He tore down not the trees, but the pagan idols and he drove out evil spirits from a local spring that was ‘fit for human purposes but polluted by pagan error’ and subject to ‘demonic infestation’. He then tamed it by channelling the spring through a lead pipe, controlling the resource and marking the new Christian control of the landscape.<sup>1</sup>

This is one of a series of medieval religious stories from the Ardennes that emphasise the importance of monastic control over water resources, water technology and religious practice. Such religious accounts, when used alongside administrative sources, allow us to explore the way that interactions with nature shaped and supported medieval cultural identities. The monks of the Ardennes created this and other stories in part to explain and heighten the importance of monastic engineering efforts which gave them temporal power and allowed them to tame and control both nature and religious practice.

## INTRODUCTION

During the Middle Ages water was central to agricultural pursuits, commercial ventures and daily concerns, and control of water resources brought social as well as economic power. This article discusses the importance of water resources for the Benedictine monasteries of Stavelot-Malmedy and Andages/Saint-Hubert during the early and high Middle Ages (ca. 600–ca. 1150).<sup>2</sup> These monasteries were founded in the Ardennes during the seventh and eighth centuries. As they grew in religious and economic power, they exerted wide administrative control over much of the Ardennes. Centuries before the Cistercian monks would become famous for such activities, these Benedictine monasteries began the process of domesticating and managing the region’s waters. They canalised and managed streams, built mills and aqueducts, and drained swamps, creating new ponds. Through these activities, the monks displayed their economic wealth, their power as landlords and their social control over the secular landscape.

Because water also had spiritual meanings, this active engineering of water resources was also tied to the monasteries' religious culture. Medieval Christianity associated water with spiritual fertility, healing and religious conversion. Stavelot-Malmedy and Saint-Hubert were associated with famous evangelising saints and linked the conversion of people with water and with God's control of nature. The monks told stories about their founders destroying pagan shrines, erecting crosses and religious buildings, taming the rivers and streams and marking their presence in the landscape. Monastic communities combined and blended their secular and religious authority, and their responses to nature were both practical and abstract. Their control of water resources and the stories they told about water demonstrate the dynamics of this process.

As the monasteries grew in authority and prominence, the monks told and retold stories about their foundations. They also developed new stories that reflected both the continued power of the saints and the monasteries' long-established presence. They engineered water resources and maintained these structures over the centuries, and then constructed and designed miracle stories that highlighted these efforts. This linked their economic and agricultural power directly to their control of religious writing and of access to the saints, and fused their own seemingly separate identities as landlords and shepherds of souls.

The religious glorification of controlling and taming nature for economic power is at odds with some of the widely acknowledged religious goals of monastic groups. Many early medieval monasteries are associated with seeking out deserted, wild locations. According to the king who helped found Stavelot and Malmedy, these houses were built 'in our forest of the Ardennes, in an empty place of solitude'.<sup>3</sup> Located along rivers that snaked their way through densely forested peaks, the monasteries were established only miles away from one another, and were, for the most part, run as a single entity. Their founder, St Remacle, decided, in the words of his ninth-century biographer, to 'go to this deserted space (*eremus locus*), and there, remote from men, [live] without anything but God'.<sup>4</sup>

Such early descriptions of the area's solitude are part of an idealised interpretation of the local landscape which in reality included other secular and religious settlements. Though not all monastic communities sought out such isolation, Remacle and the generations of monks who came after him needed to be able to see their forest as a desert. Monastic tradition idealised the 'desert' and many monks sought out less-settled landscapes or places that seemed geographically isolated by natural barriers such as swamps, cliffs or forests. Because of the importance of the desert ideal, in many analyses of medieval attitudes towards nature, forests such as the Ardennes have become synonymous with medieval wilderness. Yet though many monks claimed to seek out wilderness, they rarely found it, and when they did, they did not long leave it as such.<sup>5</sup>

The desire for finding an isolated landscape was accompanied by a sense of the importance of converting that wilderness so that it became 'fit for hu-

man purposes' (*hominum quidem usibus apti*). In part, this transformation of landscapes was a part of the daily reality of living in the world and supporting communities of monks with clean water and food, and creating a physical place to worship God. But the large-scale monastic clearance of forest land, farming of arable land, and harnessing of rivers and streams were also tied to their goals of converting local pagan groups. Wild nature could be associated with paganism and demons and the monks saw themselves as bringing order, control and right religion to these untamed landscapes.<sup>6</sup>

The monks of the Ardennes manipulated the water resources of the region, turning them to human profit, thereby increasing their own prominence in the economic landscape. They also increased the prominence of the monasteries and their saints by telling miracle stories that reinforced the image of monastic resource control and the role of the monks in water miracles. By controlling both the water resources and the stories told about water, the monks ensured their continuing control over the natural and religious landscapes they oversaw.

#### CREATING A RELIGIOUS LANDSCAPE IN THE ARDENNES: REMACLE'S FOUNTAIN

Although there was some Christian presence in the Ardennes during the Roman and perhaps the Frankish periods, widespread Christianisation did not begin until the seventh century.<sup>7</sup> This process was led by evangelising monks such as St Remacle, who founded Stavelot-Malmedy around 648 and remained abbot until his death in 670. He was then buried at Stavelot, where his body (or relics) later became a focal point of the region's religious devotion.<sup>8</sup>

Over the course of the next century, Stavelot and Malmedy continued to develop their relationship with secular and religious patrons, to increase their economic power base, and also to establish their identity as a religious centre. Remacle's successor, Babolenus, began the process of connecting the houses to saintly power; Pope Vitalian gave him the relics of St Semetrius, which became the first focus of the houses' religious cults. By the start of the next century, as the royal dynasty changed and Remacle and the Merovingian foundation faded from living memory, the monasteries actively promoted their founder and their own history.<sup>9</sup>

In order to increase Remacle's prestige and to retain and promote the history of their monastery, the monks of Stavelot produced and commissioned several narrative accounts of the events of his life and the miracles that he performed after his death. The earliest of these, the *Vita Remacii Prima*, or the first biography of St Remacle, was written by an anonymous author (probably a monk at Stavelot) in the early ninth century. The second biography, generally referred to as the *vita Remacii*, was commissioned by an abbot of Stavelot and a bishop of Liège in the late tenth century. In addition to these biographies (or *vitae*), the

monks also produced a collection of miracle stories (the *Miracula Remacli*) that was begun in the ninth century.<sup>10</sup>

The monastery of Andages or Andagium was first established in the Ardennes in the early eighth century. Around the time that Stavelot was beginning to promote Remacle, Andages acquired its own patron saint. The monastery was re-founded in 817, when the Bishop of Liège and Emperor Louis the Pious sent a group of Benedictine monks to renew the small monastery. As part of this process, the body of St Hubert was moved in 825 from Liège to provide the core of Andages' new religious identity. These events led to a flurry of religious writing intended to link the revitalised monastery with their new patron saint.<sup>11</sup>

The monks produced several biographies of St Hubert and books of miracle stories. The first biography of Hubert (the *vita prima sancti Huberti*) had been written (possibly at Liège) during the mid-eighth century, before the saint was moved to Andages. It set the stage for the later cult that would develop in the Ardennes. A second biography was written after 825 and includes the story of the saint's relocation, emphasising the new importance of the Ardennes in the saint's identity. After Hubert was moved to Andages/Saint-Hubert, a cult began to develop, and the monks began to record and broadcast stories of his miracles. The first book of miracles was written shortly after the second *vita* (ca. 840–845) by an unknown author. The second book of miracles was written during the eleventh century, again by an unknown author (since they were used to establish the saint's cult, both were most likely written by monks from Saint-Hubert or on behalf of the monastery).<sup>12</sup>

The narrative sources associated with the foundations and early histories of these monasteries establish the monks' religious goals and show the degree to which they associated their saints with the control of nature and the landscape. The *vita Remacli prima's* account of the foundation of Stavelot and Malmedy links isolation and solitude with the physical landscape occupied by the monasteries. The site was described as an empty place where Remacle could live a religious life far removed from the secular world. There is no mention of a pre-existing population in the first account. The author of the later *vita Remacli* perpetuated the idea of isolation by describing the environment more closely. Stavelot and Malmedy, in the 'forest of the Ardennes' were dominated by their harsh and inhospitable environments. Stavelot was 'confined by mountains', and the construction of buildings at Malmedy was 'impeded by the swamps'.<sup>13</sup>

Despite these problems, Remacle chose this site because, unlike a nearby place 'full of springs' it had enough space for future building programs. The biography thus acknowledges and praises the monks' physical presence in the landscape. As Stavelot and Malmedy grew, they attracted visitors and attention. The monks had to reconcile this popularity with their desire for solitude. The author of the *vita Remacli* attempted to do this by choosing natural metaphors to describe the process, noting that a 'stream' (*agmen*) of monks and Christians flowed into the region.<sup>14</sup> This connected the secular and spiritual growth of the

monasteries back to the isolating properties of the natural location and to the ability of the monks to control and direct this powerful force.

Though there are many nature metaphors found in Stavelot's religious writings, one story stands out both for its strong image of the control of nature and for its longevity within Stavelot-Malmedy's historical memory. Through the story of Remacle's fountain, the *vita Remaculi* uses one of the streams near the new monasteries to show the ability of the monks to domesticate the wild landscape. By describing the religious conversion of the stream alongside its domestication, the monks tied their practical control of nature to their identity as evangelisers.

According to the *vita Remaculi*, when Remacle first visited the area around Malmedy he went to the Warche River. He found a place with 'waters full of fish' and abundant meadows. But he also found signs of former pagan cult practices. The local population had been 'bound up by idolatry' and signs of their pagan practices were still present in the landscape. These signs included effigies and mysterious 'stones of Diana', (*lapides Dianae*), possibly a religious site or altar linked to Diana of the Ardennes, an amalgamation of a local nature goddess and the Roman huntress. Remacle exorcised the spring, freeing the place of evil pagan influences by invoking Christ's name and making the sign of the cross over the water, which was 'polluted by pagan error'. The demonic infestation appears to have been represented by the drying up of the spring, because the biographer notes that once the saint had made the sign of the cross over it, water once again flowed from it, drop by drop. Remacle did not stop there; after exorcising the spring, he took care to make the resource more useful and stable. He made a leaded pipe for the spring, causing water to gush forth, converting the wild spring into a managed resource. Wishing to establish monastic practical and spiritual authority permanently over the site, he erected a stone cross and built an oratory and dwellings for the monks. These actions physically marked the presence of the Christian group and connected religious conversion with the engineering of water resources and the conversion of the landscape.<sup>15</sup>

By including this episode in their foundation story, the monks reinforced their permanent presence in the landscape and established their identity as the representatives of the true religion. According to monastic memory, the freeing of this water source from evil spirits was even at the root of Malmedy's name (*Malmundarium*), because it had been freed from evil spirits ('*malorum spirituum infestatione mundaverat*'). Remarkably, in spite of the importance of this conversion, there are no examples in the *vita Remaculi* of the conversion of people. The author chose to use the natural landscape (stones and streams) to stand in for the larger populations, perhaps in order to retain the false impression of a landscape of isolation, idealised elsewhere in the foundation accounts.<sup>16</sup>

Another story from the *vita Remaculi* links this idea of isolation directly to water sources. In a vision, Remacle allegedly revealed to a later monk a fountain 'fit for human purposes' and 'a place that was always quiet'.<sup>17</sup> Though it is not

possible to determine if this is the same fountain as the *fons Remaculi*, the author's statement that this spring was 'fit for human purposes' ties it to the other fountain and the foundation story. The author of the *vita* shaped the early legend of the origin of 'Remacle's fountain' and introduced the idea of miracles associated with it, but it was the later collection of Remacle's miracles that ensured that the fountain remained a clear point on the religious landscape. Some of these stories connect Remacle's fountain and other water associated with the saint to miracles of healing. For example, the monks told the story of a blind woman whose sight was restored after washing her eyes in and drinking from the fountain.<sup>18</sup> This miracle is similar to a healing miracle (discussed below) associated with St Hubert and linked to monastically controlled waters.

The similarity of miracle stories to one another is a reminder that Remacle's fountain is by no means unusual. As noted above, water was a powerful symbolic force in the Christian Middle Ages, and stories of saints and holy men controlling water and other forces of nature abound. That does not, however, lessen the significance of this story. On the contrary, this story, which is set in their own landscape, remained an active part of the monasteries' self-identity and the monks continued to highlight Remacle's taming of the landscape.

As Amy Remensnyder shows, stories emphasising the founding of monasteries and Christian sites on earlier pagan sites were common in the early Middle Ages. However, she argues that by the twelfth century this aspect vanished from many of the retold narratives, since by then 'the landscape, at least as remembered, was safely Christian'.<sup>19</sup> Interestingly, this temporal shift is not seen in the foundation legends from Stavelot-Malmedy; the conversion of the landscape is most prominent in the tenth-century *vita Remaculi* but continued to be found centuries later.

In the twelfth century, a famous abbot of Stavelot-Malmedy named Wibald commissioned a golden altarpiece. This work prominently featured the Christianisation of the landscape. It depicted several scenes from Remacle's life, including the foundation of both houses. One panel depicted the foundation of Malmedy and the establishment of Christian features on the pagan landscape. The Malmedy panel was dominated by the clearing of the forest and the construction of the monastery. One monk knelt on the roof of the monastery, and near the almost completed building two others were in the process of felling tall, leafy trees. Another monk held a hammer, with which he drove a cross into the ground above a naked, two-headed female figure, two cart wheels and a small animal. This was a graphic representation of the pagan symbols described in the *vita Remaculi*, and the altarpiece labeled them as associated with Diana. The pagan statue of Diana lay upside down on the ground underneath a cross. Remacle was shown blessing the cross, with a stream or fountain flowing by his feet.<sup>20</sup>

This recreation of the legend of Remacle's fountain shows the afterlife of that story. In the twelfth century, images that tied the foundation of the monasteries and the establishment of Christianity in the region closely to control of



the natural world were still a vivid part of monastic memory and imagination. The golden depiction of the conversion of the pagan fountain reminded its viewers, standing in the large and rich church built in the former wilderness, that the saint's religious power was linked to the conversion of the landscape. This also continued to validate the monks' physical presence in and control over that same landscape.

Another religious narrative from Malmedy, the *Translatio Quirini* further links the monks with a wonder-working water source, and with control of the saints. The narrative recounts the relocation of portions of the bodies of saints Nicasius, Quirin and Scubicule to Malmedy. In 1042, some of the local inhabitants doubted the authenticity of the relics, and the abbot opened the casket which reportedly contained the body of St Quirin and relics of his companions, relics of St Just and St Ouen, and two of St Peter's teeth. This crisis of belief in the relics, combined with competition with Stavelot, might have been the background for Malmedy's production of the *Translatio Quirini*.<sup>21</sup>

According to the *Translatio*, while the monks were bringing the relics to Malmedy, they arrived at a fountain near the monastery. Because of the heat, they decided to rest by the fountain. While they were there, a crippled woman was miraculously healed, and the fountain became an established place on the religious landscape. It was thereafter called the *fons sancti Quirini* or the 'fountain of St Quirin'. The name and memory of the fountain endured 'and not without merit; it is not only sweet for drinking, but indeed it brings health to the faithful who seek it'. Remacle's fountain had also been characterised by its simultaneous usefulness and sanctity, and the story of Quirin's fountain may have deliberately reflected the older stories. In this and other ways, the *Translatio Quirini* appears to have been intended, at least in part, to compete directly with the miracles and cult locations associated with St Remacle. The stories about St Quirin were written during a period in which cults at both monasteries were growing, as were tensions between Stavelot and Malmedy.<sup>22</sup>

Some of the further miracles associated with the relics of St Quirin show how saints were believed to be able to leave their mark on the landscape much more directly. At another place, the monks came to a river where it was customary for the women to come from all over 'to put their flax in the running waters, so that, taking the power from [the stream], it would be malleable'. One woman, inspired by the presence of the martyr's relics, confessed in front of a crowd of onlookers gathered to see the saint that she was in the habit of secretly taking the flax left by different people, 'so that I might look after my own poverty from out of the abundance of others'. In recognition of her confession, at the place where the relics had rested 'the grass kept its greenness eternally; it was neither burned by summer's heat nor taken away by winter's freeze'.<sup>23</sup>

This miracle reflects the peaceful and 'eternally quiet' site revealed by Remacle and also closely resembles another miracle found in the *Passio Agilolfi*. This hagiographical source was likely written by the same author as the *Translatio*

*Quirini*, and describes the location of the martyrdom of St Agilolf. On that site, 'the seed of the place was preserved in perpetual greenness'. Borrowing from his own earlier work, he then reported that the greenness of the spot 'was neither burned by summer's heat nor taken away by winter's freeze'.<sup>24</sup>

According to this anonymous monk from Malmedy, both of these places were set apart from the rest of the agricultural world because of their sanctity. The site of Agilolf's death 'remains to this day unable to be cultivated and, as the inhabitants can testify, frequently glows with light during the night'.<sup>25</sup> The site where Quirin's body rested was similarly (though less explicitly) distinguished by its transformation from practically to spiritually useful. The eternally verdant grass near the river was part of a Christian landscape. But before it became a religious site it had been a part of the local economic landscape, and the story both marks holiness and suggests how the monks could connect religious authority to their economic identities. By reporting the 'customary' uses of the river and the woman's guilty confession, this story reflects the monastic role in regulating local land-use customs. This is not unique; many of the miracle stories from Stavelot-Malmedy have such double roles. The *Miracula Remacli*, for example, shows the saint punishing violators of pasturing customs and of bans on holy-day labour.<sup>26</sup> Such stories were rooted in and validated the monasteries' actions as landlords and social authorities.

#### MONASTIC HYDRAULIC ENGINEERING: EXERTING ECONOMIC POWER AND SOCIAL CONTROL

How should such religious stories be incorporated alongside archival records and archaeological evidence to understand medieval relationships to the environment? Studies of medieval water technology such as mills tend to focus almost exclusively on normative and administrative sources such as charters, legal formulae, polyptychs or property lists.<sup>27</sup> These sources share the advantage of providing potentially plotable and countable mill sites, and help historians make arguments about settlement history, expansion of the technology, the economic management of estates, and the degree to which a particularly landscape had been transformed. Medieval mill studies emphasise such questions, and many could be classified as histories of technology or as agricultural or landscape histories.<sup>28</sup> Such concerns encourage the use of sources that seem to be more objective than hagiographic works and to reflect reality.

When religious sources are used, they are, for the most part, incorporated to provide further examples of possible locations for mills, descriptions of mill technology, or economic and industrial uses for water mills. Rare is the attempt to discuss the meaning of the inclusion of mills in religious literature, or to explore the cultural and religious significance of the fact that the monastic authors inhabited a world that they had so successfully transformed.<sup>29</sup> Hagiographical

sources are mistrusted, in part because they reflect one another, as in the case of St Quirin's fountain, which builds on the earlier stories of Remacle's fountain. Often overlooked is the fact that these hagiographical sources did not interact only with other religious narratives. Like the altarpiece that contained both religious stories and a property list, religious narratives were closely associated with the houses' charters, letters and other documents.

The sources related to Stavelot-Malmedy's foundation are a good example of this. There are several important royal charters that officially sanctioned the houses' foundations in the seventh century. These Merovingian royal charters and several early papal charters remained a living part of the houses' later identity. The manuscript tradition highlights this; an eleventh-century codex from Malmedy contains hagiographical writings about Remacle and then a series of copies of the early charters. In this context, these legal documents had become part of the religious history of the monasteries.<sup>30</sup>

The charters were not only preserved alongside religious narrative; they were also incorporated into it. The commissioner of the *vita Remacii* noted the rich trove of charters housed at the monastery, and the *vita* was quite indebted to the language and the narrative presented in the earliest charters. For example, when describing the foundation of the monasteries, the *vita* author engages directly with charter vocabulary, attempting to define and clarify a measurement term (*leuga*) from a Carolingian confirmation of one of the early charters.<sup>31</sup>

Miracle collections borrowed the format of charters to add a sense of authority and temporal context. A miracle from the second collection of St Hubert's miracles describes a storm. The story begins like a charter, noting that the storm took place 'in the 837th year from the incarnation of the word, when Louis the Pious was in the twenty-fifth year of his reign, and Walcaud, the bishop of Liège, had served for 28 years'.<sup>32</sup> Charters in turn reflected the language of religious sources in order to add a sense of sanctity. For example, many of Stavelot's charters take care to note that Remacle's relics 'were resting quietly there'. This blending of legal record and religious narrative further challenges us to acknowledge that hagiographical sources were both in dialogue with broad Christian themes and at the same time intimately bound up with local events, people and landscapes.

The stories about Remacle's fountain connect miracle to history and also tie the monasteries of the Ardennes into the broader context of early medieval monastic engineering. In the late seventh century, the monastery of Saint-Denis in Paris had an underground aqueduct supplied by a fountain that was named 'St Remigius' fountain' after the monastery's founding saint. At Malmedy, Remacle reportedly poured lead into the source of the spring, likely following the practice of channelling small streams through the use of lead conduits. This practice is evident in several other German monasteries, though at a later date. Regensburg had two managed water supplies by the twelfth century, and at St

Emmeran an abbot was memorialised on his tombstone for having 'built the lead water conduit'.<sup>33</sup>

Monastic hydraulic engineering extended well beyond channelling streams or springs and included complex systems of canals and water drainage systems that ensured both the supply of fresh water and the removal of waste water. The Maulbronn monastery, for example, had an elaborate canal system that flowed through many buildings, including the forge. It carried non-drinking water throughout the monastery and provided for sewage disposal. The canal at places ran underground, and in other places ran in an open stream bed that was channelled and lined; this system included at least one mill race.<sup>34</sup>

As the many studies of mill technology have shown, monastic communities throughout medieval Europe participated in hydraulic engineering projects. The monks of the Ardennes did not need to irrigate land because of a lack of water; instead, their water engineering would likely have been designed to harness the power of the mountain streams and rivers and to try to control runoff. The region is mountainous, with steep and highly variable terrain, and major mountain ridges surround both Stavelot-Malmedy and Saint-Hubert. Several rivers course through the mountains and hills, and there is a complex network of springs, brooks and smaller tributaries. The water table is generally high, and the soils of the Ardennes do not respond well to heavy rains, which can lead to erosion, swampy conditions and floods. The soils' unsuitable reactions to water, either excessive drainage or the creation of swamp land, are exacerbated by the region's cool and wet conditions.<sup>35</sup>

To control and redirect the waters, the monks of Stavelot built and maintained an aqueduct or waterworks, to which they made significant repairs at least once. In a letter he sent to an absent abbot, the deacon detailed the changes to the infrastructure that had taken place. Among other things, the aqueduct had been rebuilt and a wall had been built around a new apple orchard. Although not specifically linked, the rebuilding of the water system corresponded to a new plantation, which suggests that the system may have been used to divert water to or away from the orchard. It might also have been used to drain or empty the area that had been turned into a new cemetery. One of the more complex examples of monastic waterworks in the Ardennes may have been the one described in a religious source from Saint-Hubert. It appears to have conducted fresh spring water throughout the monastic complex, channelling it through many of the buildings.<sup>36</sup>

Monasteries were able to be leaders in hydraulic engineering throughout the Middle Ages because they were some of the most powerful landholders. They had the ability, knowledge and resources to create and maintain larger-scale waterworks. Their interest in doing so was in part because of the religious importance of water. Some Roman aqueducts, for example, were used to feed Late Antique baptisteries. They also engaged in this process because of the social and economic status imparted to those who controlled water technology.<sup>37</sup>

Water-powered mills were among the most common forms of medieval water control, and show the pervasiveness of monastic control of water resources. As expensive, successful and necessary parts of the agricultural infrastructure, mills were a visible sign of the wealth and status of their owners, and of human control of the landscape. Though the large-scale use of mills and hydraulic power tends to be associated with the twelfth century, mills dotted the early medieval landscape. There is evidence for water mills in Gaul by the beginning of the first century A.D.. One milling complex has been excavated near Arles that was built in the second century, and the Mosel had a mill by the 350s. In England, Richard Holt suggests that watermills were used from Late Roman times into the early Middle Ages, 'probably without interruption'. On the continent, monastic records show that throughout the Carolingian Empire, most peasants had access to mills within five kilometres of their villages. A survey of the Loire valley has shown that before the year 750 there were already at least 138 mills in operation. The 820 polyptych from St Germain-du-Pres shows that the monastery owned at least eighty-four mills.<sup>38</sup>

Unfortunately, no comprehensive property list exists for either Stavelot-Malmedy or Saint-Hubert, and there is very little archaeological evidence for these communities. One short survey of irrigation canals and field drainage in the medieval Ardennes includes discussion of the scant traces of irrigation networks. This survey discusses two charters from Stavelot-Malmedy and briefly investigates the history of one of the properties that the houses controlled, the *fic* of Wellin. However, the authors are able to draw few firm conclusions, in part because of the almost total lack of archaeological traces of mills in the Ardennes.<sup>39</sup>

Nonetheless, the scattered evidence suggests that the rivers of the Ardennes flowed through numerous monastic mills. Through the twelfth century, surviving documents from Stavelot-Malmedy name at least eighteen mills on fourteen properties. Saint-Hubert controlled at least sixteen properties with mills.<sup>40</sup> One of Stavelot's tenth-century charters names two properties with mills: the manors at Nohas and Baldav. The manor at Baldav was described in a property or holdings list as 'a good *curtis*, but badly devastated by its enemies; having good fields, a bakery/brewery, a mill and a large woodland'.<sup>41</sup>

Sources from Saint-Hubert are not very detailed, but a few comments can be made about the monasteries' mills. Like the manor of Baldav, several of Saint-Hubert's mills were on properties that had ovens or bakeries. Several of the properties had more than one mill, such as the property where Saint-Hubert received permission to build a third mill on the same site. Because of the brevity of the chronicle notice, no details of construction are noted, but most of the mills are associated with fishing. Mills, fisheries and 'still and running waters' are commonly linked in the chronicle and other sources. One charter describes a property with 'two fisheries in the water above the mill', and another records an apparently independent mill 'named Cheterners'. Because of the brevity of

the Saint-Hubert sources, however, most recorded mills appear only in short property descriptions, such as that for the property of Summoulum (Somal) in the pagus of the Ardennes that included 'a mill, a fishery, a woodland, cultivated and uncultivated lands, and all of the servants who belong to the estate'.<sup>42</sup>

Most of Stavelot-Malmedy's mills are also recorded in such property lists, and for some properties little is known other than names. One of the exceptions to this is Stavelot-Malmedy's mill at the villa of Germigny, which provides an example of continuity of mill use and location. The villa included a multiple mill ('two mills under one roof'). This milling complex would have included two millstones in order to produce a higher output for the villa, which was one of the more substantial and important of the monasteries' holdings.<sup>43</sup> In addition to the actual mills, the monastery also possessed explicit rights to the villa's water resources, including not only the river and any man-made diversions, but also ponds and other still water.

The two mills in Germigny are first recorded in a charter from the year 650 but were of an even earlier origin, since at the time the charter was issued, the mills were already established. They then appear in two more seventh-century royal charters, both of which confirm monastic control of the property. With these initial privileges Remacle attempted to establish the monasteries' core estates early and clearly. His efforts seem to have paid off, because the mills appear again in a papal confirmation from 1049, which includes notice of Stavelot-Malmedy's continued ownership of the multiple mill, with no major changes noted.<sup>44</sup>

The mills at Germigny show up again in four papal confirmations from 1143 to 1154.<sup>45</sup> Though these papal confirmations are further removed from the mill's physical location, the monks of Stavelot were quite actively involved in procuring papal concessions and even in shaping their contents.<sup>46</sup> Though the details are masked by the repetitive nature of confirmation charters (though it should be noted that Stavelot-Malmedy's charters rarely repeat older ones verbatim), the existence of these mills through five hundred years of documents suggests continuity of mills on the site.

Another set of mills, at the estate of Calchus (or Chooz), are also recorded in some level of detail. Unlike the documents of Germigny that recur over centuries and rightly or artificially give a sense of continuity and stability to monastic properties, Calchus appears to have been a long-standing problem that the monks found various ways of dealing with. The property appears in a miracle story included in the *Miracula Remaculi*. This portion of the collection was probably written between 980 and 1007, and it suggests that Calchus was a significant property already posing administrative problems.

The story opens by explaining that the estate had important fisheries and that 'it was the custom to set over them a monk from the monastery about whose faithfulness there could be no doubt'.<sup>47</sup> This suggests that there were administrative reasons that the monks would take an exceptionally active role in the day-to-day running of this estate. The concern for the productivity and

reliability of Calchus' water resources would surface again. At the time described by the miracle, an elderly monk named Leutfrid had been the supervisor for a year, and he had made sure that there were always sufficient fish caught for the monastery. At this point, fishing seems to have been based on the river. The local fishing practice included using nets (*retus*) thrown from boats and setting out seines (*sagenae mittuntur*).<sup>48</sup>

The story is a further example of how the miracle collections reflect the local landscape and economy even though they contain generic Christian themes. After describing the monk and his fishing skills, the miracle quickly takes on a traditional Biblical theme: the miraculous catch. It so happened that it was the feast day of St Remacle, which increased the demand for fish for the monastic table. Yet no matter what he tried, he was unable to catch any fish. Worried a personal shortcoming on his own part had led to this dearth of fish, he prayed to Remacle. Suddenly, a wave swamped over the boat, leaving a fish and a puddle of water. Inspired, the monk began to put his seines back in and quickly caught enough fish both for the feast day and for distribution to the poor.<sup>49</sup>

By describing so explicitly the religious reasons the monks needed the fish (rather than the economic ones), the author of this miracle justifies the direct monastic management of the estate, and their participation in what could be a very lucrative use of the local waters. The monks directly managed a potentially valuable and problematic fisc, and then by telling a miracle story, attempted to sacralise these economic activities. The saint recognised that the waters needed to serve monastic purposes, and the blessing of an abundant catch validated these efforts.

Despite the monks' attempt to assert both practical and spiritual authority, it appears that Calchus and its waters fell out of direct monastic control. In 1126, more than a century after the compilation of the miracle stories, a charter tells another story of administrative problems, monastic intervention and control of water resources. Monastic investigation found that the estate had fallen into disrepair. The granary and the cow barn were ruined and the mill above the Meuse River was at that point completely useless, yielding no profits. The monks drastically altered the property's economic and administrative status, and assigned the management and rebuilding of the estate to a hunter named Hugo, who was charged with restoring the mill.<sup>50</sup>

The monks made plans to improve the pre-existing fisheries. This was another benefit of mill technology: millponds could serve as artificial fishponds and the canals and lined watercourses associated with mills could also be connected to weirs. Calchus' mill had active fisheries connected with it, and its manager was given the authority over the professional fishermen (*piscatores*) that the monks appear to have previously exercised in person. Evidence for the importance of fishing at the estate comes both from the miracle story and from the charter, which reports the payments and economic return of the estate. During the Middle Ages incomes from mills could be rendered either in currency or in grain

tithes. Calchus was to supply the monks with grain and fish cakes, composed of brined fish, grain and pepper. This composite product of the fishery and the mill suggests the degree to which mills and river fishing were bound together in the Middle Ages, and is a reminder of the value of these water resources to monastic owners.

Though the restoration of the Calchus mills is not detailed, the surviving record of monastic mills at the property of Leignon provides more information on the technology and engineering process. The monks controlled the estate which had two mills 'from more ancient times'. By the early twelfth century both were dwindling in profits. There is no hint of the type of neglect the monks found at Calchus. Instead, the water supply for the two mills had largely dried up, and the work to restore their productivity had not yet been carried out. In the early twelfth century, the monks restored the old mills and built a third, new mill.<sup>51</sup>

This example shows the extent to which the monks were capable of transforming landscapes. In the process of restoring the mills at Leignon, the monks used their ability to direct the labour of their dependents and gathered a large work force with which they diverted the course of the stream. In addition to restoring water to the older mills, they blocked the stream ('*fontium obstruens meatum*'), drained nearby swamp land, and constructed a mill pond, where they built the new mill. The profits of the restored old mills belonged to the monastery, and to protect their investment, the monks pledged support monies to be used to prevent the mills from again becoming neglected and run-down. They specified that the money was to be used for materials for roofing, millstones, blades or wheels and everything else necessary for the repair of the mill.<sup>52</sup>

The ability of monks to endow and support mills in part explains the general success of monastic control of water resources. Evidence of preventative measures also shows that the monks were concerned with the tendency of mills to become run-down or obsolete. Around the same time as the restoration of the mill at Leignon, the monks also built a mill on the Amblève River, near the monasteries. (The two projects are recorded in the same charter.) They included provisions that reveal the monks' long-term interest in the mills. For the first generation of its operation, the mill's four builders (*constructores*) were given operational control and ownership of the mill and its incomes, but only for their lifetimes. This grant can be seen as a shrewd attempt by the abbot to ensure that the mill would be built to last; these men would have a personal interest in their work. The abbot also ceded to the mill the tithes from four nearby properties. The tithe moneys would be used for the renewal and maintenance of the mill. This extra income was specifically intended to prevent the neglect or disrepair of the mills. Both of the clauses show concern for the long-term stability of the mill, highlighting what Richard Holt has described as the 'clear contrast between the short-term mentality of secular lords and the long-term, corporate, mentality of monastic lords'.<sup>53</sup>



Long-term planning was not the only thing that distinguished monastic control over water resources from that of secular landlords. Monks were, first and foremost, religious leaders. They viewed the natural landscape as a part of the world that could be controlled and even converted as a part of their religious mission. The monks therefore used their control over water resources, their engineering efforts and the resultant economic and social power in order to back up and reinforce their religious power. They also told stories that clearly linked the power of the saints to the natural landscape that they themselves had shaped and controlled.

#### ENGINEERING MIRACLES: EMPOWERING THE CANALS OF SAINT-HUBERT

As noted above, St Hubert was, like Remacle, one of the great missionaries of the Ardennes. The earliest of St Hubert's biographies highlights his early actions, noting that he freed the local population 'from error' and 'washed away [their paganism] by the waters of baptism'. Like Remacle, he was associated with the destruction of pagan sites and the Christianisation of the landscape. The first biographer writes that Hubert 'destroyed the many idols and sculptures that were gathered together in the Ardennes, which deserved to be burned by fire'. When the 'fanatical' locals persisted in venerating and honouring the ashes of their idols, Hubert ordered them to observe harsh penance, incorporating them into the Christian social structure. Finally, Hubert transformed the landscape by building churches dedicated to the holy martyrs 'in many different places'. The author of the biography signals this creation of a religious landscape with nature metaphors, noting that once Hubert had done this, the kingdom of the Franks was lit up 'by a most splendid illumination, as if by the rays of the sun'.<sup>54</sup>

Such descriptions of the sun breaking through darkness or storms as a symbol of miracle and divine favour is common in hagiographical sources. However, it should be noted that many of the sources from the Ardennes chose to use this image, especially in the context of frightening or uncontrollable rainstorms. For example, the author of the first collection of St Hubert's miracles, written in the eleventh century, described the ending of a terrible storm: 'and the darkness of the dense clouds, broken through by the radiant beams of the sun, was soon brightened'. Both of Hubert's *vitae* and the first two miracle collections contain many detailed descriptions of rivers swollen with flood waters or too shallow for boat travel; there are storms, floods and devastating rains, and water metaphors abound.<sup>55</sup>

Hagiographical stories written and crafted in and about the Ardennes evoke not only larger Christian messages, but also the local landscapes. Rain, storms and violent weather were common occurrences, and the authors of religious sources responded to the local landscape by creatively adapting older *topoi*

and literary passages. They called upon their readers (and those being told the stories) to relate broader messages to their own experiences, and to associate their immediate surroundings to miracle. In this context, the ability of saints to tame and control natural forces becomes a mark of spiritual power. The monks also described themselves as tamers of their environment, and incorporated the landscape they lived in and shaped into the religious and cultural world that they constructed around themselves.

The second biography of St Hubert, written after the saint's body had been transferred to Andages, follows the same basic structure of the first biography, adding the story of the relocation of the saint. The first two miracle collections are similarly linked. The later hagiographical materials parallel and reiterate but do not exactly duplicate the earlier versions. This repetitive structure reinforces the problem of what to do with monastic tropes—but the presence of novelties and notable differences between the versions suggests that they should not be offhandedly dismissed, and that the repetition of stories and metaphors may increase their cultural significance rather than dull it.

The author of the second biography of Hubert picked up the nature metaphors found in the first account: 'Throwing the seeds of the good work on to good earth', the 'holy cultivators began to flow towards that place from all sides'.<sup>56</sup> By linking the monks' religious success to cultivation metaphors, the author tied religious purpose directly to the monastery's success as an agricultural landlord. Most relevant for the current discussion, the image of the monks flowing towards the monastery from all directions to aid in the cultivation of souls is reminiscent of the flowing of water through irrigation networks. This image, which mirrors the language of the *vita Remacli*, was used many times in the writings associated with St Hubert, most notably in a miracle story about the healing of a blind woman.

This miracle is a direct example of monastic attempts to reconcile their economic and agricultural control of the landscape with their religious purpose. It is recorded in both early miracle collections; the first book describes it in greater detail. An unnamed woman who had been blind from birth went with her parents to give alms at the monastery. When they entered the monastery, there was a teeming crowd of people. The mass of unseen people overwhelmed her, and she asked her parents to take her outside. Once outdoors, she asked them to take her to the place 'where the irrigation stream that had been diverted ... from the spring called "Andaina fontana" flows through canals for various monastic purposes'.<sup>57</sup>

The miracle is filled with watery language, drawing attention to the monastically controlled waters. When the woman enters the church, the people are described as a mingled mass of people and as a flowing wave ('*fluentibus undequaque plebis commixtae catervis*'), whose chaotic motion she tries to flee. When she asks to be brought away, the author uses a Latin word that could also be used to describe water diversion ('*citatim me deviate*'). Her movement from

chaos to monastically imposed order is further highlighted by the description of the water. It is specifically described as a diverted stream (*limpha ... derivatur*), flowing through canals into the monastery, where it was redirected to suit monastic needs.

When the woman's companions brought her to the water, their description of the site further highlighted the structure of the monastic hydraulic works. 'Look', they said, 'water is flowing through the canals.' The attempt to link monastic engineering to religious message is here reinforced by a tone of religious command: '*Ecce aqua per canales defluens*'.<sup>58</sup> The woman then washed her face three times in the water, and 'light filled her eyes'. Although derived from a natural spring, the water that cured the woman was monastically engineered. The woman sought out the diverted, managed waters controlled by the monastery. These waters became the vehicle for the saint's power. By telling the story in a way that emphasised the role of the monks themselves in constructing the healing canals, the author of this story was asserting monastic dominance over not only the water, but also the miraculous landscape.

Medieval miracle stories, though probably based in part on local lore and oral tradition, survive because monks decided to commit them to writing. These collections, though often compiled over several generations, were deliberately selected and arranged in a way that would glorify the saints who performed the miracles. A secondary and often more immediate goal of these collections was to draw attention to the monastery or church that held the body or relics of the saint, in order to encourage pilgrim traffic and trade and to garner the support and patronage of elite donors.

The narrative structure that the monks of Saint-Hubert designed in order to tell the story of the blind woman's healing expresses these multiple functions. The story showcased their technological achievement — the complex water system that they had constructed to channel and redirect the natural spring. This redirection of the spring not only reinforced their control of nature, but reminded those who saw it or read about it of the monastery's economic power and social status. But there were many ways the monks could have highlighted this secular power, and the impact of this story is broader. By using religious miracle, the monks linked their own manipulation of nature with that of their saint. The saint (and God) transcended nature by restoring the woman's sight. The vehicle through which he did so was not the natural spring, but instead the water the monks had engineered for their own purposes. The monks of Saint-Hubert thus balanced their secular and religious powers, ultimately reinforcing both.

The importance of these images of water control is reinforced by the second book of St Hubert's miracles, written almost two centuries later. The anonymous author of this second miracle collection also relates the story of the healing of the blind woman. However, this second account is drastically abridged, and most of the details of the story are left out. For example, all reported speech is removed, even a direct invocation of the saint. Interestingly, a statement of the

woman's desire to travel on pilgrimage to the monastery is also omitted. In spite of the abridgement, the author chose to retain the watery images of the flood of people in the church (*eam confluentibus turbis*). Most importantly, the author retained the woman's request to be led 'to the waters, which flow through the canals for the use of the monastery (*in usus monasterii*)'. Once there, the author reports, she washed her face three times, 'and in between washings' (*inter abluendum*) prayed to the saint. Her sight was restored. The canals are the only substantial detail retained, and they again deliberately represent monastic power over nature and miracle.<sup>59</sup>

The monks of Saint-Hubert were able to tell and re-tell a story that associated the healing power of their saint with a specific economic resource, a canalised stream that had been engineered by the monastery. The significance of the creation of such a story is underscored by its repetition. This is similar to the telling and re-telling of the story surrounding the foundation of Malmedy. By creating a story in which St Remacle controlled and harnessed a spring, the monks of Stavelot-Malmedy tied their saint to the natural landscape and connected monastic hydraulic engineering directly to the religious conversion of the Ardennes. By retelling this story, and by enshrining it on an altarpiece, the monks reinforced their claims over that landscape and justified their economic control of the region. By claiming saintly approval of waterworks, irrigation canals and similar parts of the agricultural infrastructure, the monks of the Ardennes used their religious identity to justify and reinforce their social and economic power.

The canal system at Saint-Hubert was described as being intended to serve monastic purposes or uses (*'ad diversos monasterii usus influit'* and *'in usus monasterii'*). This language is similar to that found in the sources from Stavelot and Malmedy, which several times describe monastic fountains as 'fit for human purposes' (*'hominum quidem usibus apti; humanis usibus opportunem'*). Though this can reflect the repetitive nature of hagiography, it may also highlight a regional theme, and suggests that the hagiographical sources of the Ardennes were in dialogue with one another. Local context was important, and these sources engaged local experience, local cult practices, and even the local engineering efforts of the monks.

Despite the value of such stories, monastic narrative sources such as the *Translatio Quirini* and the *Vita Remacli* have been under-utilised in attempts to understand medieval attitudes towards nature. Unlike charters, which despite their repetitive and formulaic nature are generally treated as unique sources reflecting specific events and moments in time, hagiographic sources exhibiting a similar type of patterned language are often treated as generic rather than specific. However, though they contain echoes of earlier works, many were composed and compiled locally with clear agendas, including that of tying saintly power closely to a specific local landscape.

The Ardennes were full of monastically engineered water sources, and unsurprisingly, such efforts appear in their religious literature. The stories about Saint-Hubert's canals and Remacle's fountain are both centred on a natural spring that was harnessed and tamed by monks. Both of these springs became associated with the healing and transformative power of evangelising saints. The conversion of the waters stood for the conversion of the wider Ardennes, and the monastically engineered water systems represented the power of the monks who were the successors of the saints. Miracle stories linked the mundane and the miraculous, the natural and the super-natural. Medieval authors created continuity between practice and interpretation, and environmental historians interested in the Middle Ages need to actively address this by paying more attention to the ways that cultural sources intersect legal ones and to the importance of investigating medieval ideas alongside medieval practice.

## NOTES

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<sup>1</sup> 'hominum quidem usibus apti sed gentilismi erroribus polluti'; 'daemonum infestationi obnoxii'. *Vita Sancti Remacli Trajectensis Episcopi* auctore Notgero, Migne *Patrologia Latina* 139, col. 1147–1168 (hereafter *Vita Remacli*), 12.

<sup>2</sup> Stavelot and Malmedy were twin institutions, and thus are often referred to as Stavelot-Malmedy. Because of their history of conflict with each other, at times I refer to the monasteries as separate institutions. Throughout this article, I refer to the monastery of Andages as Saint-Hubert in order to distinguish the monastic institution from the person, St Hubert.

<sup>3</sup> The medieval monastic idealisation of solitude had its roots in legends from the deserts of third- and fourth-century Egypt and emphasised the monastic goal of separation from the world. For an introduction to this topic, see Jean Heuclin, *Aux Origines Monastiques de la Gaule du Nord; ermites et reclus du Ve au XIe siècle* (Lille: Presses Universitaires de Lille, 1988) and C. H. Lawrence, *Medieval Monasticism: Forms of Religious Life in Western Europe in the Middle Ages*, ed. David Bates. 3rd ed. (New York: Longman, 2001). For a discussion of the monastic desert as wilderness, see Jacques Le Goff, 'The Wilderness in the Medieval West', in *The Medieval Imagination* (Chicago: University of Chicago Press, 1988), 47–59.

'in foreste nostra nuncupante Arduinna in locis vaste solitudinis'. This is the first surviving use of the word *forestis*. Halkin, Joseph, and C. G. Roland, eds. *Recueil des chartes de Abbaye de Stavelot-Malmedy. Publications de la Commission royale d'histoire*, 37 vol. 1, (Brussels: Kiessling et Cie, P. Imbreghts, successeur, 1909), [hereafter abbreviated HR] 2 (ca. 648). For further discussion of this charter and of the nature of forest vocabulary, see the third chapter of my dissertation, where I argue that the term

(along with others such as *silva*) was used flexibly during the early Middle Ages. This flexibility was useful to the monks who did not want to construct either a single view of forested landscapes or an artificial divide between their own spiritual and secular uses of the natural world. Ellen Arnold, "Environment and the Shaping of Monastic Identity: Stavelot-Malmedy and the Medieval Ardennes" (Ph.D. diss., University of Minnesota, Twin Cities, 2006), 211–21.

<sup>4</sup> *Vita Remacli Prima* auctore Monacho Stabulensi anonymo, *Acta Sanctorum* [AASS] 3 September, 692–6. 'Post non multum vero temporis impetravit tandem a rege, quatinus relinquens successorem post se in sede pontificali, ut diu desiderabat, hunc eremi locum adiret, et ibi ab hominibus remotus, soli Deo vacaret.'

<sup>5</sup> Although the Cistercians are best known for promulgating the idea that their houses were founded in such solitude and wilderness, the Benedictines were also frequently concerned with promoting this image of their foundations and social relations. The literature on wilderness in civilisation is broad. For a survey, see Max Oelschlaeger, *The Idea of Wilderness from Prehistory to the Age of Ecology* (New Haven, CT: Yale University Press, 1991). However, Oelschlaeger's account of the Middle Ages takes up only four of his 353 pages. Discussions of medieval wilderness and sense of nature include Vito Fumagalli, *Landscapes of Fear; Perceptions of Nature and the City in the Middle Ages* trans. Shayne Mitchell (Cambridge: Polity Press, 1994) and Jacques Le Goff, 'The Wilderness in the Medieval West', in *The Medieval Imagination* (Chicago: University of Chicago Press, 1988), 47–59.

<sup>6</sup> *Vita Remacli* 5. Although the Latin sources use only the term *fons*, this word can imply both natural springs and artificial or enhanced fountains. Since in this case, it is clear that the spring was engineered, I have chosen to make a distinction in translation that might not have been readily apparent in the Latin. Indeed, since the Latin terms are indistinguishable, perhaps the phrase 'fit for human purposes' is intended as a marker of human manipulation of a natural spring.

<sup>7</sup> Because of the dearth of pre-monastic sources, very little is known about the pre-Christian religion of the Ardennes. The only clear evidence comes from the predictable merging of the native and Roman pagan gods. Édouard DeMoreau, S. J., *Les Abbayes de Belgique (VIIe–XIIIe siècles)* (Brussels: La Renaissance du livre, 1952), 14. Alain Dierkins, 'De la christianisation de l'Ardenne à l'époque mérovingienne', in *Saint Remacle l'apôtre de l'Ardenne*, ed. Albert LeMeunier (Spa: ASBL fête de Saint-Remacle, 1995), 42–3. Édouard DeMoreau, *Les Abbayes de Belgique (VIIe–XIIIe siècles)* (Brussels: La Renaissance du livre, 1952), 15. Helga Müller-Kehlen, *Die Ardennen im Frühmittelalter: Untersuchungen zum Königsgut in einem karolingischen Kernland* (Göttingen: Vandenhoeck & Ruprecht, 1973), 39.

<sup>8</sup> Medieval Christianity recognised the intercession of saints, and both formal and informal religious practices developed around places associated with the lives of saints. The most important sites of such saint cults were the places where the saints were buried. These cult practices included, but were not limited to, formal liturgies, informal devotional practices, pilgrimages, and (importantly for the monasteries) donations of goods and property to the saints. For an introduction to early medieval saints' cults, see Peter Brown, *The Cult of the Saints: Its Rise and Function in Latin Christianity* (Chicago: University of Chicago Press, 1982) and Thomas Head, *Hagiography and the Cult of Saints: the Diocese of Orleans, 800–1200* (Cambridge: Cambridge University Press, 1990).

<sup>9</sup>HR 5. For a more detailed discussion of the early history of the houses and their relations to the Merovingian and Carolingian monarchs, see the first chapter of my dissertation, 'Environment and the Shaping of Monastic Identity'.

<sup>10</sup>For more information on the religious writings from Stavelot and Malmedy, see François Baix, 'L'Hagiographie à Stavelot-Malmédy' *Revue Benedictine* 60 (1950): 120–62.

<sup>11</sup>See Georges Despy, 'Questions sur les origines de l'abbaye de Saint-Hubert' *Saint-Hubert d'Ardenne, Cahiers d'histoire* 8, (1991), 242–56 and Satoshi Tada, 'The Creation of a Religious Centre: Christianisation in the Diocese of Liège in the Carolingian Period' *Journal of Ecclesiastical History* 54, no. 2 (April 2003).

<sup>12</sup>*Vita Prima Sancti Huberti*, auctore anonymo, AASS 1 November, 798–805. John of Orleans, *Vita Secunda Sancti Huberti*, AASS 1 November, 806–18; *Miraculorum S. Huberti post mortem, liber primus*, auctore coevo, AASS 1 November, 819–23 [hereafter *Miracula Huberti prima*] and *liber secundus*, auctore anonymo, AASS 1 November, 823–9 [hereafter *Miracula Huberti secunda*]. The issues associated with using a series of biographies and miracles is discussed below.

<sup>13</sup>*Vita Remacli Prima 2; Vita Remacli*, 12: 'Arduennam silvam paludibus et montibus impeditam', 13: 'ad Amblavam fluvium in cuiusdam montis confinio substitit'.

<sup>14</sup>*Vita Remacli* 4. 'Etsi autem locus ille multos haberet fontes, tamen quod angustus esset ... videt locum spatiosiore futuroque operi accommodatiorem.' The *agmen* of monks is interesting, because it has many possible meanings, including that of an 'army' of men. Thus, it simultaneously reflects both the connection to nature metaphors (the monks of Stavelot are elsewhere referred to as bees swarming around a hive) and to the image of monks, saints and martyrs as soldiers of Christ. There are many nature words that could be similarly flexibly applied, such as *fons* or *forestis*. Often the ambiguity may be deliberate, in order to allow the monks the greatest possible range of expression and meaning.

<sup>15</sup>*Vita Remacli* 12. 'Videns autem vir sanctus locum illum tum piscosis aquis tum pascuis uberrimis ...'; 'Igitur adhibita adjuratione per Christi nomen, et S. Crucis signo expresso, locum illum a daemonum incursatione vindicavit et expiavit, moxque aqua ab ipso suo meatu guttatim dilapsa evanuit'; 'plumbum in foramina infundens'. This description of Remacle's actions is a reminder that Christian sacred landscapes, though rooted in the natural world, often involved human (or divine) manipulation of nature. John Howe describes the 'firm' medieval belief that 'even a *locus amoenus* could be improved'. In idem. 'Creating Symbolic Landscapes: Medieval Development of Sacred Space', in John Howe and Michael Wolfe, eds., *Inventing Medieval Landscapes: Senses of Place in Western Europe* (Gainesville: University Press of Florida, 2002), 211.

<sup>16</sup>*Vita Remacli* 12.

<sup>17</sup>*Vita Remacli* 5. '*perpetuae quietis locum*' and '*humanis usibus opportunem*'.

<sup>18</sup>*Miracula S. Remacli episc. et conf.* ed. Io. Veldius. AASS 3 September, vol. 1 [hereafter *Miracula Remacli*] 1.3.

<sup>19</sup>Amy Remensnyder, *Remembering Kings Past: Monastic Foundation Legends in Medieval Southern France* (Ithaca: Cornell University Press, 1995), 45.

<sup>20</sup>Unfortunately, the work was destroyed, but a detailed drawing of the altarpiece was made, and then copied. A thorough discussion of this artwork and its problematic transmission is found in Susanne Wittekind, *Altar - Reliquiar - Retabel: Kunst und Liturgie bei Wibald von Stablo* (Cologne: Böhlau, 2004). This panel has been discussed in the

context of the conversion of the pagan natural cult sites by Pierre Koumoth, who presents a useful survey of early Christian reactions against nature cults. Pierre P. Koumoth, 'Des arbres sacrés païns à l'Arbre-de-Vie chrétien dans le retable de saint Remacle à Stavelot', *Folklore: Stavelot-Malmédy* 54 (1993), 42–67.

<sup>21</sup> These saints were originally buried at Vadiniacus (Gansy l'Île), but during the Viking invasions they were transported to Rouen along with the body of St Ouen. Later they were moved to Condatum (Conde), and then finally to Malmédy, where the cathedral still claims to house them. Balau, *Étude Critique*, 227. Benoît van den Bossche, 'Saint Remacle, moine: éléments de biographie'. In *Saint Remacle l'apôtre de l'Ardenne*, 47–54.

<sup>22</sup> *Translatio Malmundarium et miracula ss. Quirini, Nigassii, et. al.*, AASS 11 October [Hereafter *Translatio Quirini*], 2.22. In discussing the *Translatio Quirini*, Baix notes: 'Telle est la dernière production hagiographique de combat, sortie du 'scriptorium' de Malmédy.' Baix, 'L'Hagiographie à Stavelot-Malmédy', 162. The same monk also appears to have composed the *Passio Agilolfi*, a fictionalised account of a local saint. This is edited and published as the *Vita Agilolfi*. AASS 2 July, col. 714–23 [hereafter *Passio Agilolfi*].

<sup>23</sup> *Translatio Quirini* 2.24, 'ut ex aliena abundantia consulerem paupertati meae'; 'viriditatem sui perpetuo conservat gramine, ut nec aestivo exuratur fervore nec hiemali adimatur frigore'.

<sup>24</sup> *Passio Agilolfi* 2. 'Locus ... viriditatem sui perpetuo conservat germine, ut nec aestivo exuratur fervore, nec hiemali adimatur frigore.'

<sup>25</sup> *Ibid.* 'sed et inarabilis mantet usque hodie, et, ut testantur incolae, crebro per noctem micat lumine'.

<sup>26</sup> *Miracula Remacli* 1.1 and 2.15.

<sup>27</sup> For an example, see Dietrich Lohrmann's exhaustive study of the early medieval mills in the Loire and Escaut river valleys. This article relies heavily on the polyptychs of Saint-Germain-du-Prés and Saint-Bertin, and incorporates monastic charters, Merovingian formulae, toponymy, later maps and other polyptychs in order to assess and quantify the status of mill-building and mill-usage during the seventh–ninth centuries. He does cite annals and a few religious sources, including Gregory of Tours, but does not attempt to connect the motives and purposes of these sources, nor to use them in any way other than to find examples of early mills. Dietrich Lohrmann, 'Le moulin à eau dans le cadre de l'économie rurale de la Neustrie (VIIe–IXe siècles)' in H. Atma, ed., *La Neustrie: Les pays au nord de la Loire de 650 à 850*, vol. 1, 367–404

<sup>28</sup> There is a long historiography on the questions of mills and milling technology. For a recent critique of the historiography see Miquel Barceló, 'The Missing Water-Mill: A Question of Technological Diffusion in the High Middle Ages' in Miquel Barceló and François Sigaut, eds., *The Making of Feudal Agriculture*, (Leiden: Brill, 2004) 255–314. For overviews of the technological diffusion of mills, see Richard Holt, *The Mills of Medieval England* (Oxford: Basil Blackwell, 1988) and the more recent work by John Langdon, *Mills in the Medieval Economy: England 1300–1540* (Oxford: Oxford University Press, 2004). Both of these works focus on issues of technological development in England (where much of the work to date has been done).

For the Continent see Paolo Squatriti, *Water and Society in Early Medieval Italy: AD 400–1000* (Cambridge: Cambridge University Press, 1998) and Paul Benoit and Joséphine Rouillard, 'Medieval Hydraulics in France', in Paolo Squatriti, ed., *Working*



with *Water in Medieval Europe* (Leiden: Brill, 2000), 161–215. Benoit and Rouillard point out that until recently, French studies of water technology were primarily done by archaeologists, local historians and legal historians, whose goals and questions further reinforce the emphasis on location, technology and legal control of mills and their profits. Squatriti's work is broad in scope and incorporates social history alongside the history of technology, exploring both uses of water and the social attitudes towards water use.

<sup>29</sup> Studies of Cistercian agriculture are an exception to this. For overviews, see Constance H. Berman, *Medieval Agriculture, the Southern French Countryside, and the Early Cistercians. A Study of Forty-three Monasteries*. Philadelphia: The American Philosophical Society, 1986; Constance Brittain Bouchard, *Holy Entrepreneurs: Cistercians, Knights, and Economic Exchange in Twelfth-Century Burgundy* (Ithaca: Cornell University Press, 1991).

<sup>30</sup> Halkin and Roland, eds., *Recueil des chartes*, xlv–xlvi.

<sup>31</sup> *Vita Remacli*, preface, 20.

<sup>32</sup> *Miracula Huberti secunda*, 1. 6

<sup>33</sup> On Saint-Denis, Benoit and Rouillard, 'Medieval Hydraulics in France', 167. This original hydraulic system was abandoned by the end of eighth century, when it was replaced as the primary water source by a stream. On Regensburg and St. Emmeran, Klaus Grewe, 'Water Technology in Medieval Germany' in Paolo Squatriti, ed., *Working with Water in Medieval Europe*, 137.

<sup>34</sup> *Ibid.*, 141. Susanne Arnold, 'Wasserwirtschaft im ehemaligen Zisterzienkloster von Maulbronn' in *Water Management in Medieval Rural Economy: Les usages de l'eau milieu rural au Moyen Âge. Ruralia 5*, supplement 17, 183–7. Even this well-known monastery has yielded very little archaeological evidence of its mills and water system; though traces are visible in the landscape, the system that extended beyond the monasteries' walls is still little known.

<sup>35</sup> Giovanni Hoyois, *L'Ardenne et l'Ardennais. L'évolution économique et sociale d'une région*, vol. 1 (Brussels: J. Duculot Press, 1949), 21–3, 30–33. M. Terlinden, 'La Forêt du Hodinfosse et la station de sechage de bois de Haute-Ardenne (Vielsalm) (Excursion des 15 et 16 septembre 1987)', *Bulletin de la Société Royale Forestière de Belgique* no. 2, March–April (1987), 91. René Noël, 'Pour une archéologie de la nature dans le nord de la "Francia"', in *L'Ambiente Vegetale Nell'Alto Medioevo* (Spoleto: Settimane, 30 marzo–5 aprile, 1989), 779.

<sup>36</sup> For Stavelot, Philipp Jaffé, 'Wibaldi epistolae', in *Monumenta Corbeiensia*, (Darmstadt: Scientia Verlag Aalen, 1964), no. 256. For Saint-Hubert, *Miracula Huberti*, 1, 8.

<sup>37</sup> Grewe, 'Water Technology in Medieval Germany', 133. Squatriti, *Water and Society*, 139–42.

<sup>38</sup> Benoit and Rouillard, 'Medieval Hydraulics in France', 169. Richard Holt, 'Medieval England's Water-Related Technologies', in Paolo Squatriti, ed., *Working with Water in Medieval Europe*, 57–8. Lohrmann, 'Le moulin à eau', 368. Benoit and Rouillard, 'Medieval Hydraulics in France', 171.

<sup>39</sup> Philippe Mignot and Johnny De Meulemeester, 'A propos de l'hydraulique en Ardenne belge' in Jan Klápšt, ed., *Water management in medieval rural economy. Les usages de l'eau en milieu rural au Moyen Âge*, 3–10. Památky archeologické, Supplementum 17, Ruralia V. Prague: Institute of Archaeology, Academy of Sciences of the Czech Republic, 2003.

<sup>40</sup> Most early charters from Saint-Hubert were lost in an 1130 fire, but Saint-Hubert's chronicle, written between 1098–1106, drew heavily on now lost records of property donors and donations. The chronicle was integrated into the surviving charter base by Godefroid Kurth, *Chartes de l'abbaye de St Hubert en Ardenne* (Brussels: Academie Royale de Belgique, 1903).

<sup>41</sup> HR 74. 'curtem bonam sed ab hostibus valde vastatam, agri culturas bonas, cambam, molendinum et silvam magnam'.

<sup>42</sup> Kurth, *Chartes de l'abbaye de St Hubert*, nos. 49, 63, 92, 90 and 30. The property list reads: 'cum molendino, piscatura, silva, terris cultis et incultis et cum tota familia ad ipsum pertinente'.

<sup>43</sup> The mills were also surrounded by a cleared area that probably, if better-documented English mills can provide analogy, contained outbuildings such as storage sheds or even a house for the miller. Holt, 'Medieval England's Water-Related Technologies', 67. Multiple mills were described as consisting of two mill engines, 'under one roof' or 'in one building'. Although most multiple mills were on the same banks, one multiple mill excavated at Abbotsbury in Dorset had two engines opposite each other on different sides of stream.

<sup>44</sup> HR 3, 8–9, 111.

<sup>45</sup> HR 178. Celestine II confirmed ownership of the mills in a longer list of holdings. The mills were confirmed again by Lucius II (HR 179), Eugenius III (HR 182), and Adrian IV (HR 248).

<sup>46</sup> This point is especially relevant for the papal charters issued between 1143 and 1154 during the abbacy of Wibald. Wibald was an active correspondent with the popes, had a close relationship with one of the papal chancellors, and even drafted official imperial correspondence to the popes. It is unlikely that he would expend papal favour and support on a property that the monastery was no longer interested in developing.

<sup>47</sup> *Miracula Remacli* 1. 18. 'in ea igitur, eo quod sit piscaturae habilis, ante moris erat monachum a monasterio statuere, de cuius non dubitaretur fide'. Calchus also appears in the second book of the miracle collection, 2.2.

<sup>48</sup> Richard Hoffmann refers to this miracle story as evidence of weir fishing. See Richard Hoffmann, 'Economic Development and Aquatic Ecosystems in Medieval Europe', *American Historical Review* 101, no. 3 (June, 1996), 636 n. 18.

<sup>49</sup> Ibid. 'elevataque subito a flumine unda navim concite tamquam acta flumine petiit, ac magnum in ea pisces cum latice simul iniecit'.

<sup>50</sup> HR 145. The report noted that the monks were unable to draw any produce or profits from the mill: 'que nulla omnino habebantur'.

<sup>51</sup> HR 141, 'ab antiquis temporibus'; 'que dum propter nimium aque defectum illis non valerent sufficere'.

<sup>52</sup> Ibid. 'in tecto, mola, rotis, sc[erptis]' Since the millpond was built explicitly for the new mill, Leignon may have had both of two common medieval water-mill types, the weir and leat mill and the millpond mill. There are some later English examples of both types existing in combination or at the same sites. Langdon, *Mills in the Medieval Economy*, 76–7.

<sup>53</sup> Holt, 'Medieval England', 88.

<sup>54</sup> *Vita Huberti prima*, 3. ‘baptismi unda ablutos’; ‘Idola plurima et sculptilia, quae colentes erant in Ardoinna, igne cremanda destruxit’; ‘fanatici’; ‘et velut radius solis splendiflua inluminatione ... inluxit’.

<sup>55</sup> *Miracula Huberti prima*, 1. 6. ‘opacitasque nubium mox percussa solis radio suo enitesceret jubare’.

<sup>56</sup> *Vita Secunda Sancti Huberti* 31. ‘sed super optimam terram jacto verbi semine’; ‘in eumdem locum religiositatis cultores confluere’.

<sup>57</sup> *Miracula Huberti prima*, 8. ‘ubi irriguosa foret limpha, quæ de fonte vocabulo Andaina fontana dirivatur ... et eam ubi per canales ad diversos monasterii usus influit, illuc postulando perduci impetravit’.

<sup>58</sup> *Ibid.*

<sup>59</sup> *Miracula Huberti secunda*, 9. ‘petiit ut ad aquam, quæ per canales in usus monasterii influebat, deduceretur’.