

# An Investigation into the Uneven Distribution of Early Gothic Churches in the Paris Basin, 1140-1240<sup>1</sup>

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Gothic architecture evolved in the Paris Basin during the century that separated St. Denis from Ste. Chapelle. There are more than a thousand churches containing something from this intensely creative period. This article will air some questions that arise from the curious distribution of these churches.

During the summer of 1980, I visited all the buildings noted in the literature and in the archives as being of this period.<sup>2</sup> By the end of the year, the list had grown to 315, over thirty of which I had found by accident.<sup>3</sup> It was easy to suspect that there would be more buildings, and so during the summer of 1981 I made a complete survey. In over seven months I visited every town in the Basin, and saw some 3,500 churches. This increased the list from 315 to 1284 — to four where there had been one. French scholars were not surprised that the original list was neither accurate nor complete.

Map I shows the clearly defined zone within the Paris Basin that contains most of these churches. There are relatively few beyond this boundary, and though the list con-

tains a number of cathedrals, they are peripheral to the most energetic centers of production.<sup>4</sup> The extent of the complete survey is indicated by dashed lines.<sup>5</sup> Besides the royal censuses taken around 1300, there is little data available from earlier medieval France that is not piecemeal. This survey seems to provide the most comprehensive statistical map available for the area.

Few have had the opportunity to visit all the buildings from a particular time and place. There is a great assurance in such a total survey, for it provides a solid idea of the period's diversity and conventions. Style was necessarily the basis for selection, as there is little assured dating.<sup>6</sup> Though the dates for these churches seem to lie between the landmarks of the St. Denis choir and Ste. Chapelle, it is possible that some may have been earlier, prefiguring ideas that Suger may have utilized rather than invented, and that others may be later, continuing to employ concepts that had become outmoded elsewhere.

It is a bewilderingly varied period, and a simple clear definition of its stylistic characteristics remains elusive.

<sup>1</sup> This research was supported by the Visual Arts Board of the Australian Council in 1980, and by the Graham Foundation for Advanced Studies in the Fine Arts and the Australian Research Grants Committee in 1981. I am deeply grateful for their support, for without it the considerable costs involved would have made the survey impossible. I am also greatly in debt to the many people who have guided me in preparing this paper, and though the errors and omissions are mine, whatever may be positive in it owes more to others than I can adequately express. Among art historians, I wish to thank Professor Anne Prache of Paris IV, Professor Leon Pressouyre of Paris I, and M. François Salet, also Professor François Bucher, Professor Roger Adams, Danielle Johnson, Dominique Vermand, and Jane Williams who have helped solve many problems, and Gislain Brunel who gave permission to use his unpublished research into the Soissonais vineyards. I was enormously helped by M. Bernard Ancien of Soissons, Professor Robert Fossier of Paris I, M. Jean Hubert of the Institut de France, and Professor Lynn White, Jr. of UCLA, Mr. Henry Kraus, Professor Jean Jacquart of Paris I and Mlle. Marie-Clotilde Hubert of the École des Chartes. Mme. Bercé of the Bibliothèque du Patrimoine and Mme. D. Herviet of the Inventaire Générale de Richesses de France were both most patient, as were Professors A. Blondeau and C. Pomerol, geologists from Paris VII. Among agricultural experts, I have relied on M. Cambeillare of the INRA, Versailles, and M. Berland, R. Hardy, and J. Roque of their Service de Cartographie. Also, I am indebted, though not least, to experts in quarries such as Mme. Anne Blanc of the CNRS, and Paul Benoit, Odette Chapelot, and Marc Viré from the Equipe d'Histoire des Mines at Paris I, and the similar-minded archaeologists Denis Defente of Soissons, Philippe Soulier of Pontoise, and Philippe Tourtebatte from Courville. Everyone's kindness and understanding have been essential. Finally a number of people have kept me company from time to time during the survey, acting as navigators and often following their own

research at the same time. It would have been lonely without them: Janet Adams who is now following the intricate politics of the Church of St. John the Divine, Grant Hildebrand of Washington University, Seattle, whose interests finish where mine begin, Val Clack who was writing her own thesis, Sue Villegas of Los Angeles, and fellow Australian David Saunders of Adelaide University. This article was completed in March, 1982.

<sup>2</sup> Principally from the *Inventaire Général des Richesses de France*; the *Bibliothèque du Patrimoine*; *Bulletin Monumental*; *Congrès archéologique*, and J. Brosse, ed., *Dictionnaire des églises de France*, Paris, 1967 *et seq.*

<sup>3</sup> J. James, *The Pioneers of the Gothic Movement*, Wyong, 1980, with map p.2.

<sup>4</sup> Outside the search limits, I visited over 100 of the better-known buildings (see note 2), being about eight percent of the total from 50% of the area. Even if we increased the numbers of this outer zone three times, as the 1981 survey has done to the list of 1980, their numbers would still not alter the dominant position of the center where on average there is one church to every 3.3 towns.

<sup>5</sup> These limits were established when I might drive for a day and not find any churches, or only a few of the simpler sort. As neither time nor patience is endless, I may have missed a few buildings, though I doubt if they could seriously modify the issues discussed here.

<sup>6</sup> We have firm dates for specific parts of only fourteen of these 1284 buildings. There are imprecise dates like non-specific references to "work in progress" or the giving of land for 24, and even more fluid ones like dedications, translations and fires for another 42, and merely indicative dates in eleven other cases. From these, the entire chronology of the period has to be extracted.

However, eliminating those elements which varied from place to place and from one contractor to another, there seem to be a number of common ideas that can be defined.

The earlier buildings can be distinguished from Romanesque by the thinning of the shafts and ribs and their gradual emancipation from the wall. Space and movement come to dominate the inertness of mass. This can be seen in the shafts of Antony, the ribs of St. Denis, and the spaces of Nouvion and St. Remi, Reims.

Throughout the century, the origins of each element remain reasonably clear, as does the expression of its function. But towards the end of the period, these distinctions blur as the hitherto separate moldings begin to fuse and their identities are lost. The projection of the impost is reduced, the scotia in the torus disappears, and window shafts not only move closer to the wall shafts, as in Avenay, but the junctions between them become fluid so they tend to merge into a bundle of functionless roll-molds, as in Ste. Chapelle. This merging becomes more universal as the importance of the wall-as-structure diminishes.

In some areas, windows become the dominant element, but this is not universal. Similarly, tallness is not to be found everywhere. Though the skeletization of structure is perhaps the most important contribution for the future, during this century it is not particularly common. The different ways of handling the forms, in small buildings as in large, all share the same approach to details. Thus the Senlis choir lies within this definition, while Morienvall does not, and the Reims cathedral aisle windows lie within it, while Damery does not.<sup>7</sup>

The survey included every building containing any work from the period, on the principle that even remains, however small, would indicate where something had been built and so contribute to the significance of the distribution. It was assumed that if a building had been totally reconstructed without leaving any trace, it would either have suffered a major tragedy like those destroyed in the recent wars, or would have been poorly built. I will describe later how I have compensated for the former, while instances of the latter will still indicate something about the funds and materials available, for insubstantial construction may be as indicative of the conditions around 1200 as more positive evidence. To the extent that this may be true, the map delimits those areas which had both the cash to build and the will to dedicate that cash to quality building and not to some other purpose.

<sup>7</sup> I refer to the main body of Morienvall, and not to the north arm, and to the choir of Damery and not the western end, both of which do lie within the definition.

<sup>8</sup> A "project" is used here to describe any part of the building constructed separately, and usually independently, of the rest, such as a nave, a tower, or a porch. One project may have been the work of more than one building "campaign" with different master masons.

<sup>9</sup> This search was part of a larger project: to accumulate the data necessary to isolate the masters who pioneered the Gothic style. The need to limit the number of churches to be studied intensively has naturally influenced the decisions made in these categories. All 668 buildings in the first three categories have been recorded; profiles and elements have been sketched

As these matters of cash and quality were considered important, the churches were separated into four categories. The first includes the most complex, being the cathedrals and the larger churches like Orbais. The second contains those with a number of parts like Lhuys, or of more than two stories like Jouy-le-Moutier and Crecy-la-Chapelle. The third category comprises those with only one major part from this period, like Hautefontaine, St. Frambourg in Senlis, or Mennency.

These divisions were based on the measure of complexity and thus the number of projects<sup>8</sup> and, for all three categories, the care taken in detailing, carving, and construction. These are the more significant buildings for the historian.

Into a fourth category, I placed the crudely built, simple, or rustic churches, and included those which had been restored beyond recognition, like St. Vincent in Senlis, Bondy, and Brenelle. Also included were earlier buildings into which vaulting or ribs were inserted, like Juziers, or where the building campaigns had been so numerous, and the resulting confusion so great, that I felt they would contribute little to our understanding of the period, like Cra moisy and Villers-Helon. This category also included all buildings where only the tower was of this period, like Varinfroy and Cauffry. This group numbered 616, or 48% of the total.<sup>9</sup>

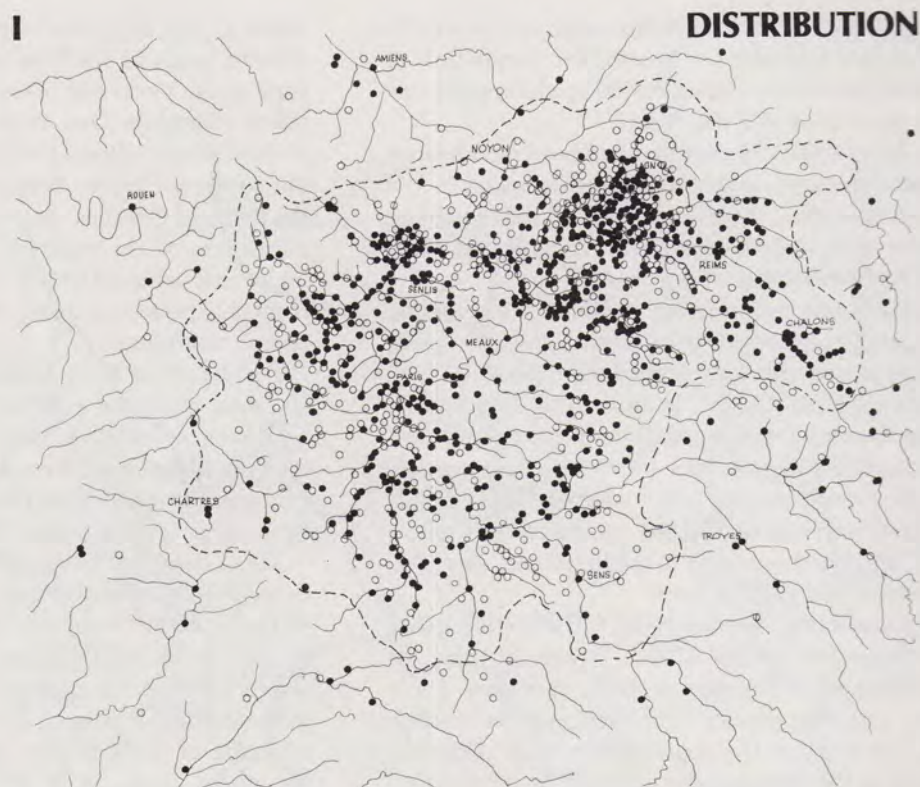
It should not be thought that the buildings in the third or fourth category were all constructed by local or relatively unsophisticated builders, nor, conversely, that these local men never worked on the better buildings.<sup>10</sup>

Similarly, it should not be thought that the quality of design and workmanship in the second and third categories was necessarily any worse than the first. They were at times built more economically, with consequent problems from damp, poor foundations, or inadequate buttressing. Yet their careful detailing and high-quality finish, the exact geometry and skilled carving in the capitals, show they were no less cunningly built and designed than the best-known works, and often by the same men.

All these 1284 churches are listed at the end of the article, without being categorized, though in Map I and in the detailed Maps 1-10 they are distinguished. This distinction has been useful, for the number of less important churches can distort our analysis of the maps. One would think that there had been a great deal of activity in the Vexin Française, the Gâtinais, and the Senonois, unless one knew that

with full-sized details of all accessible moldings, and photographs have been made of all capitals and a 3,000-card index of their characteristics. This will be computerized for the next stage of the project.

<sup>10</sup> One of the masters at Chartres, to whom I gave the name "Green" in my study of the cathedral, seems to have been a local man judging from the roughness of his work and the absence of details attributable to him in any of the other buildings visited — James, 1981, II, 484. In other buildings, crude and simple work that appears to be by local teams lies alongside masonry by the best: as in Dourdan where the eastern triforium and the lowest courses of the clerestory were erected by "Ruby" to the same plan and details he used at Chartres, and in part of the triforium in St. Leger of Soissons and St. Jacques of Reims.



**Map 1** The distribution of churches in the Paris Basin. Those from category 1-3 are marked with a solid black dot, and category four with an open circle. The dashed line notes the limit of the total search.

more than two-thirds of the buildings were in the fourth group. By comparison, only nine percent of those around Braine are unimportant.

Much has been destroyed, though the amount of violent destruction from all earlier centuries may be less than the devastation of commercial pillage since 1800 and of the colossal firepower of the last two wars, which was more likely to obliterate a building than any number of marauding fourteenth-century armies — the witnesses to whose damage may be anything but trustworthy.<sup>11</sup>

To offset this bias, I have included in the map any buildings from this period destroyed since 1900.<sup>12</sup> We still have photographs and sketches of some of them,<sup>13</sup> and though they do make a difference to the map in the area around the Chemin-des-Dames and Reims, most of the war zones

lay in areas where there were few Early Gothic churches.

I know of no way to determine whether the density found today is still in proportion to what it was in the thirteenth century, but having placed these destroyed churches on the map, I discussed the matter with three French scholars — François Salet, Anne Prache, and Léon Pressouyre — who felt the losses may have been fairly evenly spread, and that the map should be a reasonable representation of the original densities.

To check these matters, I made a detailed examination of the area around Paris. Within some fifty kilometers of the center, and excluding the churches built within Philippe-Auguste's walls, the more detailed maps of the seventeenth century show 238 towns with churches, spaced roughly three kilometers apart.<sup>14</sup> The population density

<sup>11</sup> Medieval descriptions of damage, particularly during the Hundred Years' War, are possibly exaggerated. Many churches reputedly destroyed, like Chalmaison, remain today much as they must have been in 1250. The Wars of Religion and the Protestant League may have wrought more damage than the Burgundians and the English, as their actions were specifically directed against the Church, and they used artillery. L. P. H. Denifle, *La Guerre de Cent Ans et la désolation des églises, monastères et hôpitaux en France*, Paris, 1899; L. Réau, *Les Monuments détruits de l'art français*, Paris, 1969.

<sup>12</sup> Inadequate French records suggest that 71 of the churches destroyed since 1900 contained work from this period. Of these, half would seem to have been category four. Also the 46 ruins or totally rebuilt churches are included in their appropriate categories, including those turned into granaries or houses like Montrou and Montmort.

<sup>13</sup> Bibliothèque du Patrimoine; Archives du Département de l'Aisne; Denifle (as in note 11); E. Lefèvre-Pontalis in *L'Architecture religieuse dans l'ancien diocèse de Soissons au XI<sup>e</sup> au XII<sup>e</sup> siècle*, Paris, 1894-96, and *idem*, *L'Architecture gothique dans la Champagne méridionale au XIII<sup>e</sup> et XVI<sup>e</sup>*

*siècle*, Paris, 1904; E. Moreau-Nélaton, *Histoire de Fère-en-Tardenois*, Paris, 1911; *idem*, *Les Églises de Chez-Nous, arrondissement de Château-Thierry*, Paris, 1913; *idem*, *Les Églises de Chez-Nous, arrondissement de Soissons*, Paris, 1915; *idem*, *Soissons avant la guerre*, Paris, 1915; *idem*, *Chez-Nous après les Boches*, Paris, 1919; J. Trouvelot, "Les Monuments historiques du département de l'Aisne," *Urbanisme*, 11, 1942, 329-30; J. Cameron, "Travail sur les églises détruites 1914-18," thesis in the Archives de Dommages de Guerre, Paris.

<sup>14</sup> The Beaurain Collection, *Atlas Géographique*, VIII, 1749; J. Cassini, *Carte de la France*, 1757-58; P. Mariette, *Diocèse de Paris*, 1656, and *Evêché de Troyes en Champagne*, 1656; Robert de Vaugonoy, *Atlas Universel*, Paris, 1757. See also Y. Christ, *Églises Parisiennes actuelles et disparues*, Paris, 1947; J. Petit, *L'Église en Val-de-Marne*, Paris, n.d.; and *Inventaire Général des oeuvres d'art*, 9 vols., Paris, 1886f. By basing the search on 17th-century maps, the endless churches built in the metropolis since then were eliminated. In this analysis those within the medieval city walls were excluded as their numbers may have distorted comparisons between the Paris region and the rest of the Basin.

varied from six hearths/hectare in the south to eighteen in the north. At 4-4.5 people per hearth, the population of this area would have been some 120,000, excluding the city of Paris, or more than 400 per church.<sup>15</sup>

Seventy-one of these 238 churches had been rebuilt since the maps were prepared; seventy-six were Renaissance and fourteen were medieval, from after 1240. Of the remaining seventy-seven with something in them from around 1200, fully thirty-five were category 4.

Paris, with all of its metropolitan attractions, its growing population, and its power to draw wealth towards itself, is surprisingly almost average for the region. First, 32% of the churches are Early Gothic, compared to 33% for the whole Basin. Secondly, the proportion of more significant to fourth category buildings was a little less than average — being 1.21:1 compared to 1.08:1 overall. This proportion may have been similar in 1240, as the records tell us that most of the churches rebuilt in the Paris area after 1800 were the smaller and simpler ones.

In the Val-de-Marne, we know of forty-two churches founded or mentioned before 1250.<sup>16</sup> Twenty of these, or a little less than half, still remain in whole or in part. There is no way of knowing whether this ratio may be true for the region, nor whether the depredations were greater in the Paris area as the suburbs advanced and as the fashionable views of the center took their toll. Nor is there any certain way of knowing whether those churches which disappeared were equal in quality to those which remain. Yet the figures for the proportion of extant Early Gothic churches compared to those from other periods is fairly equal in the Paris area to elsewhere, and I am therefore tempted to suggest that, excluding both the cathedrals and the smallest chapels, we may have lost not much more than half of those built around 1200, and that most of those lost may have been in the larger towns.

While the absolute numbers are interesting, it is the distribution that is important, and from which the major conclusions of this article will be drawn. Though over 90% of the churches are clustered in the Basin, their distribution is far from even.

The most important group lies in the small valleys around Soissons and Laon, and tends to peter out towards Reims and the Marne. From a sample of 135 contiguous churches from this area almost 91% were worked on during this

century. The next most concentrated group lies along the riverine areas of the Oise and its tributaries, which loses itself in the Vexin and towards Meaux. In a similar sample taken around the Oise, 58% contain Early Gothic remains. A third group follows the Seine and its tributaries, fanning out south of Paris to dissipate over the gentle flat lands of the Brie and Gâtinais. Another sample taken within sixteen kilometers of the walls of Paris shows, perhaps surprisingly, that around the city only 34% of the churches come from this period — again only the average for the whole Basin.

Besides these three centers, there are ribbons around Châlons, along the valley of the Essonne and its surrounding plains to the south, and, joining them, scattered groups through Moret and Provins. Between them lie notably vacant areas around Meaux, Epernay, and the Hurepoix where the numbers never exceed 6% of the total.

These densities are paralleled by the proportion of category 1-3 churches to those in category 4. In the environs of Paris, the proportion is 1.2:1, which comes a poor third to 2.8:1 near the Oise and a colossal 5.2:1 in the Soissonais.<sup>17</sup> When we conjoin these two sets of figures, the numerical importance of the northeastern region in the construction of Early Gothic churches is established over all the others.

It will be the purpose of this article to isolate those factors which might explain these anomalies, especially in the four areas of the Parisis, the Oise, Meaux, and the Soissonais.

### Societal Factors

Map II<sup>18</sup> shows there is no perceivable relationship between the distribution of the churches and the ancient counties, though their names are still useful. Viollet-le-Duc's dictum that "the French cathedral was born with the monarchical power"<sup>19</sup> suggests there were political reasons for the construction of religious buildings. Yet a glance at the political boundaries on Map III<sup>20</sup> shows there is no correlation between the Royal Domain and these churches. There are many in the north of the king's territory and few to the south. Similarly, to the east the densest concentration of all straddles the frontiers between the Champagne, Soissons, and Reims without extending across the entire territory of any. Clear injunctions to build would have resulted in visible concentrations of churches within the political

<sup>15</sup> J. Dupaquier, "Paroisses et communes de France," *Dictionnaire d'histoire administrative et démographique*, Paris, 1974; and *La Population rurale du bassin parisien à l'époque de Louis XIV*, Paris, 1979; F. Lot, "L'État des paroisses et des feux de 1328," *Bibliothèque de l'École des Chartes*, xc, 1929, 51-107 and 256-315. This is confirmed by the 1328 census which disclosed that there were on average 101 hearths per parish — Fawtier, 96; also Fourquin, 1956, 63-64. J. W. Baldwin in *Masters, Princes and Merchants*, Princeton, 1970, 132, estimated the Paris population at 20-50,000; Fourquin, 1956, 83, at 61,000; Lot, *ibid*; 297, at 200,000; and J. C. Russell, *Medieval Regions and Their Cities*, Bloomington, 132, at 80,000.

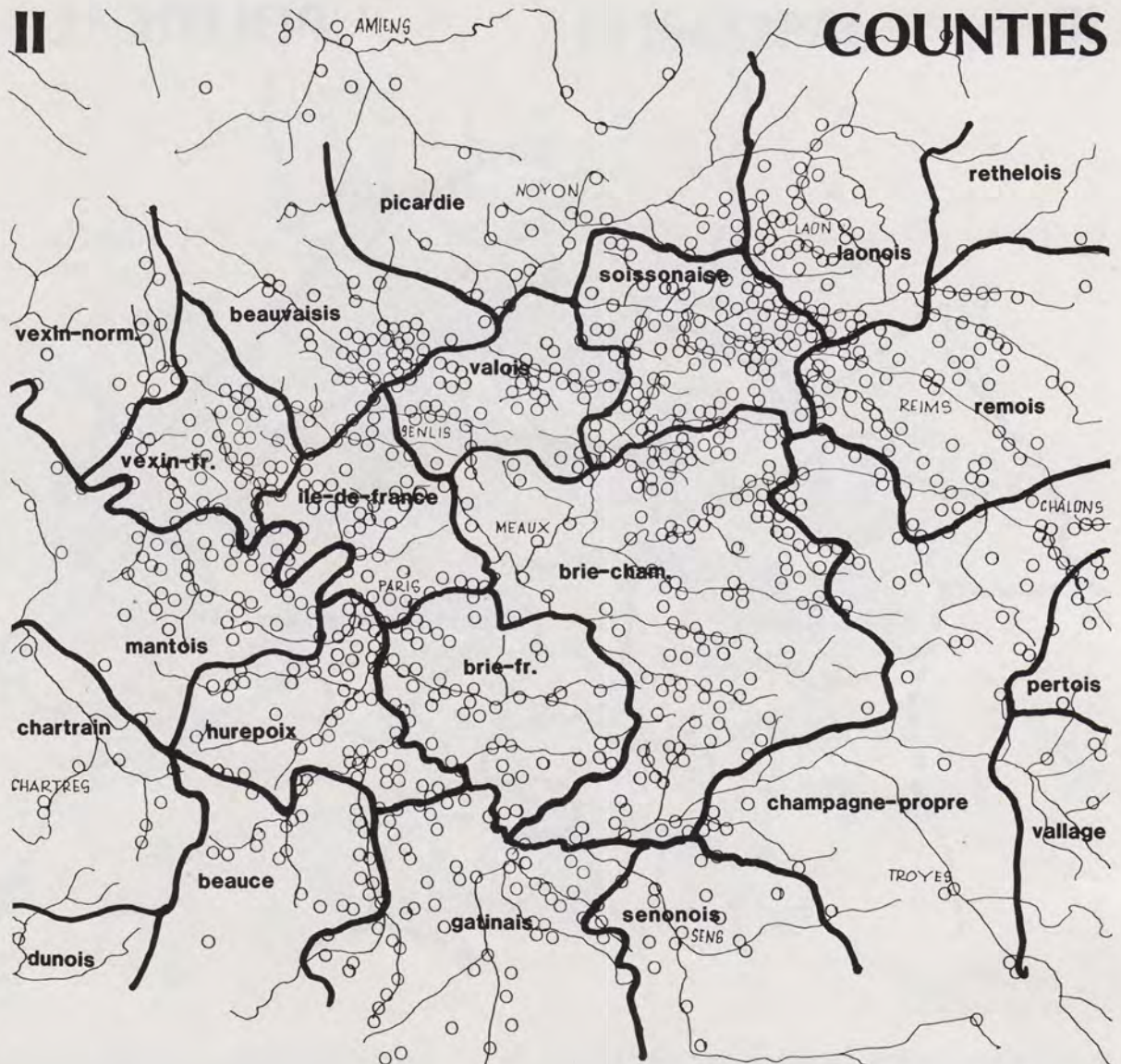
<sup>16</sup> Petit (as in note 14).

<sup>17</sup> As most of the rebuilt churches in the Paris area seem to have been of the simpler type, any disproportionate amount of rebuilding would only have accentuated this contrast — see note 14.

<sup>18</sup> These boundaries have been drawn from maps by Beurain and Cassini (both as in note 14) and J. Delisle, *France, détail des Provinces*, Paris, n.d.

<sup>19</sup> E. Viollet-le-Duc, *Dictionnaire raisonné de l'architecture française du XI<sup>e</sup> au XVI<sup>e</sup> siècle*, Paris, II, 1858, 284.

<sup>20</sup> Prepared from A. Lognon, *Atlas histoire de France*, Paris, 1885; W. M. Newman, *Le Domaine royal*, Paris, 1937; F. Schrader, *Atlas de géographie historique*, Paris, 1896; and the author's discussions with Bernard Ancien, Robert Fossier, and Jean Hubert.



Map II The ancient counties of France.

boundaries concerned, and this is not the case.<sup>21</sup>

The Artois, the Poitou, and even Normandy show little sign today of Early Gothic. This was not from lack of wealth, for the riches of Eleanor's possessions were legendary and Normandy brought the Capetians as much income as all their other possessions combined.<sup>22</sup> If churches were the outward expression of royal authority, why were so few erected in the new territories?<sup>23</sup>

The strength of the great seigneurs over their vassals grew as fast in Provins and Meaux, where there are few churches,

as in Oulchy and Soissons where there are many. There were powerful seigneurs at Fère-en-Tardenois, Braine, Coulchy, and Pierrefonds. Many churches were built around the first two, and almost none in the territories of the second. So firm feudal authority was not in itself a factor.

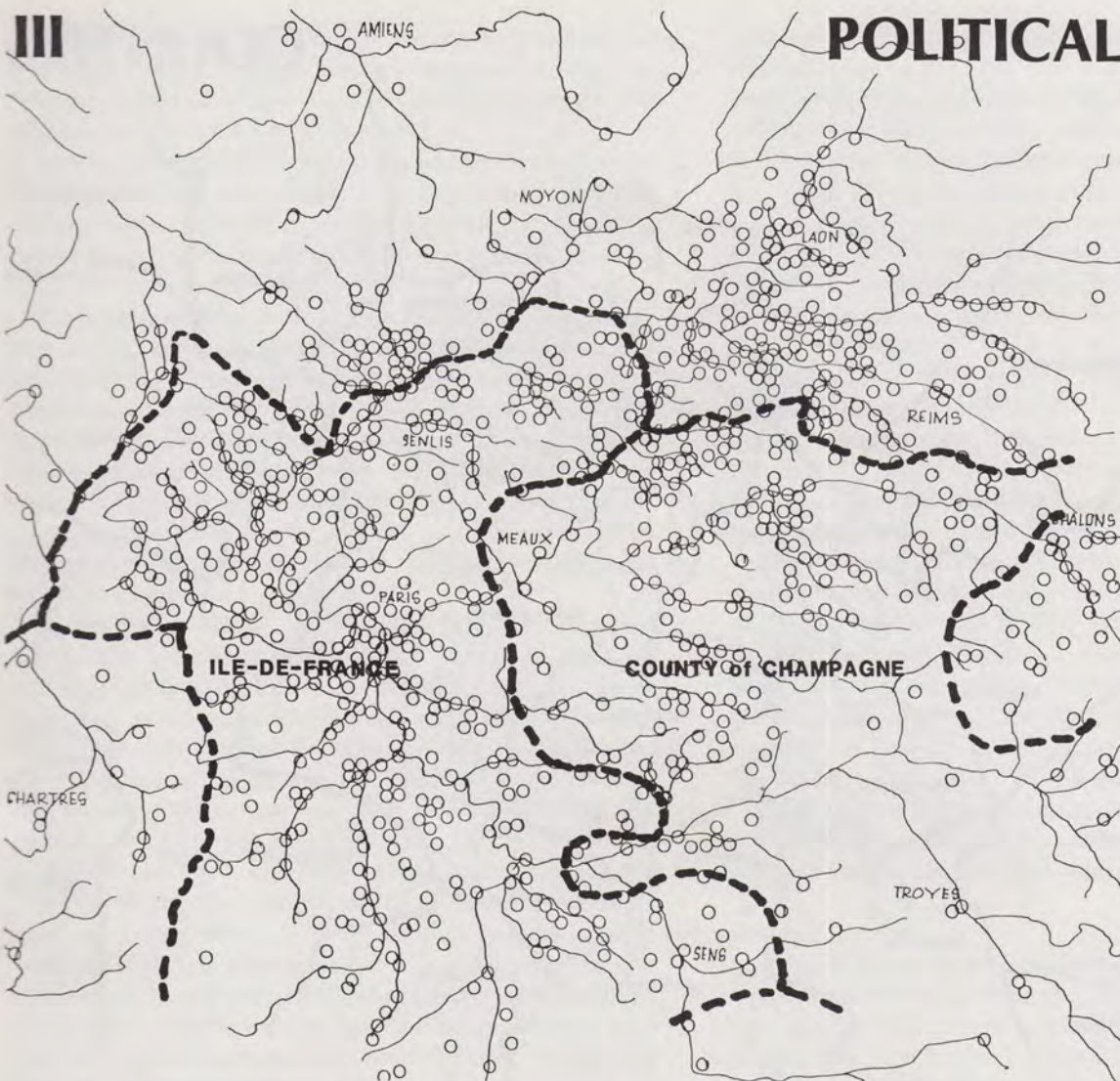
Two of the more important families, well-favored by the king, and substantial in their revenues and prospects, were the powerful lords of Montmorency and Mello. Both were in a strong position to reflect the wishes of their master and

<sup>21</sup> More new towns may have been founded in the king's territories than elsewhere, for there are ten Villeneuves with churches from this period of which nine lie within the Royal Domain, while the tenth, Villeneuve-la-Lionne in the Marne, was of Roman origin — Higouet, 1975. Though deliberate encouragement of building may have been absent, the many small churches on the plains south of Paris may have had something to do with Louis VII's positive policy towards rural improvements.

<sup>22</sup> In preparing this section, I have consulted Baldwin (as in note 15); E. Bournazel, *Le Gouvernement Capétien au XII<sup>e</sup> siècle. 1108-1180*, Paris, 1975; M. Bur, *La Formation de Conté de Champagne*, Lille, 1977; T. Evergates, *Feudal Society in the Baillage of Troyes under the Counts of*

*Champagne 1152-1284*, Baltimore-London, 1975; Fawtier; E. M. Hallam, *Capetian France*, 1980; Jean Hubert, *Arts et vie sociale de la fin du monde antique au moyen âge*, Paris, 1977; A. Longnon, *Documents relatifs au comté de Champagne et de Brie*, Paris, 1901-1914; and *idem*, "Vassaux du roi de France," *Recueil des historiens de la France*, xxiii.

<sup>23</sup> The comment by Fawtier, 165, that Gothic may have reflected something of the attitude engendered by the growing royal power, but cannot be said to have been pursued by royal initiative, is therefore more correct than Simson's that "we must assume that Gothic was considered the expression of ideas with which the crown wished to be associated" — O. von Simson, *The Gothic World*, New York, 1964, 64.



Map III The political boundaries of the Royal Domain and the County of Champagne.

to fund major building campaigns, and their best can be seen at Taverny and Mello. Yet there are only a few interesting churches in the Montmorency domain, and over forty in the other. Thus, although there may have been local political factors, depending on individual generosity, there are few signs of any long-term royal or seigneurial policy towards the construction of churches.

The vacant land around Meaux lies along the boundary between the Capetians and the Counts of Champagne. Yet the boundary itself was more a "zone of influence" than a frontier. The Count's writ was theoretically valid in the Meaux, but was in practice far from exercisable. This vacant land has been termed a "no man's land"<sup>24</sup> between the two great contestants for power, a remnant of the huge

wooded barriers that at one time divided most of the major political powers from one another.<sup>25</sup>

Yet there is no such barrier between the Champagne and the bishops of Soissons and Reims, nor between Picardy and the Ile-de-France. Skirmishes and attempts to grab territory went on all the time, and feelings would have been just as fragile between these lords and bishops as between them and the Crown. So we must rule out military considerations, except perhaps in the Vexin. The few churches and many castles in the border areas of both Vexins bear witness to the long struggle between the Norman kings and the French.<sup>26</sup> For twenty years the taxes imposed by Philippe-Auguste to pursue his wars with the English may also have inhibited building in his domain,<sup>27</sup> and may have been

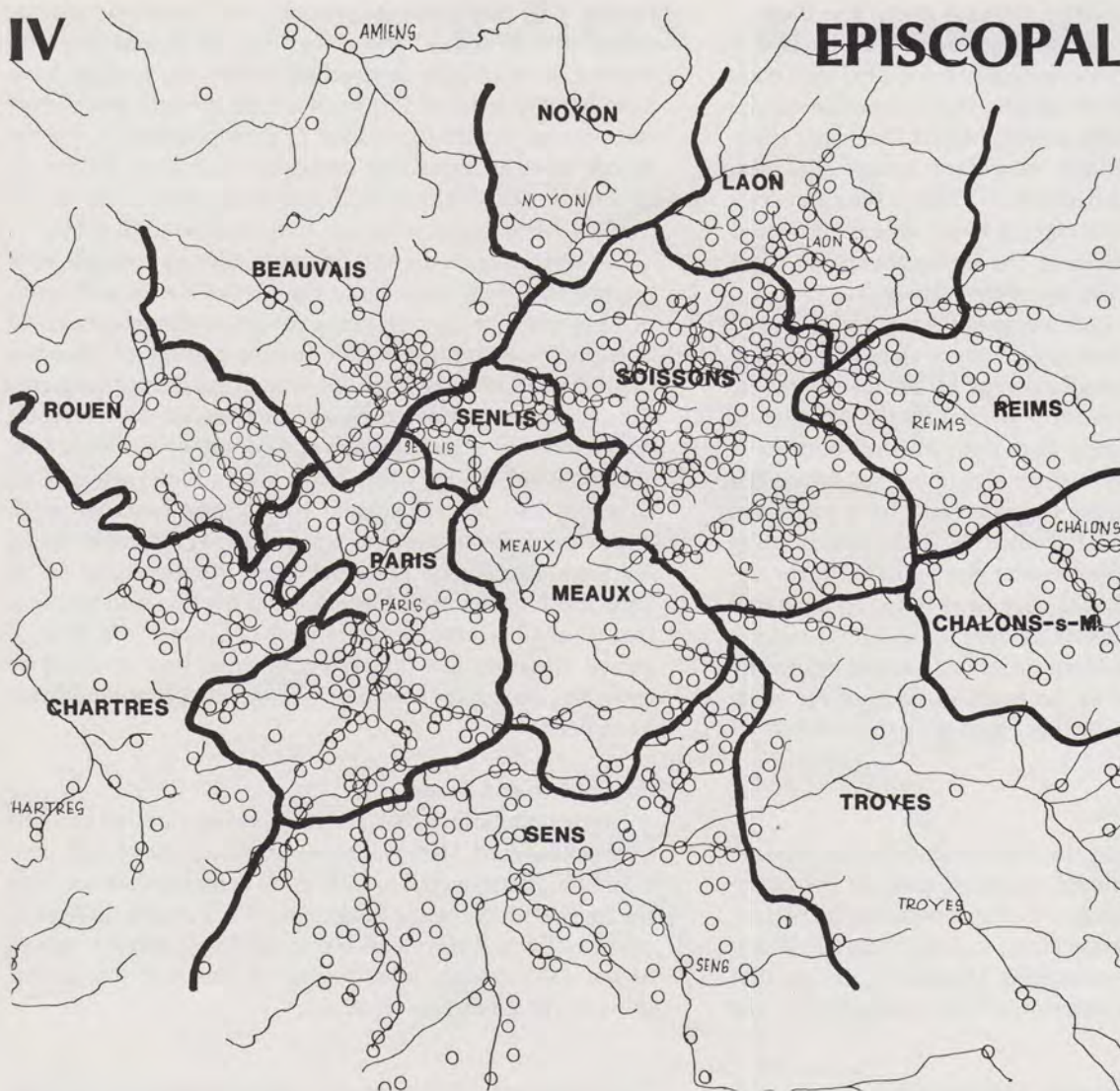
<sup>24</sup> Jean Hubert in conversation. See also his "La Frontière occidentale du comté de Champagne du XI<sup>e</sup> au XIII<sup>e</sup> siècle," *Recueil de travaux offerts à M. Clovis Brunel*, Paris, 1955, 14-30.

<sup>25</sup> Higounet, 1975, and "Les Forêts de l'Europe occidentale du V<sup>e</sup> au XI<sup>e</sup> siècle," *Settimane di studio del centro italiano*, Spoleto, 1965, 343-98; and *idem*, "Les Grandes haies forestières de l'Europe médiévale," *Revue du nord*, 1980, 213-18. The many Templar commanderies along the border suggest a peace-keeping force, if only because there are so few of those

other settlers, the Cistercians. Hubert, *ibid.*, lists 18 commanderies between Montereau and Meaux (of which six remain) compared to two Cistercian ones.

<sup>26</sup> The rarity of Early Gothic churches in Normandy may have a political basis as funds may have been diverted to other purposes, particularly after Philippe-Auguste took control of the Duchy.

<sup>27</sup> I am finding that a significantly large proportion of Ile-de-France churches seem to date from after the conquest, and relatively few from the decades before.



Map IV The episcopal boundaries.

one reason for the Braine area being so much better stocked than the Parisis.<sup>28</sup>

There is a closer correspondence between the episcopal boundaries and the vacancies around Meaux, as can be seen in Map IV,<sup>29</sup> and between the densest collection of churches and the diocese of Soissons. Yet the group of churches to the east of Meaux belies any consistent policy by its bishops, as does the spread of churches beyond the borders of the Soissonais. Similarly, the dense zone around Meaux straddles three bishoprics, two of which show little building activity elsewhere. Finally, there are very few category

1-3 buildings around Noyon, nor in the archbishopric of Sens, nor, in spite of the greatest cathedral of the age at Chartres, in the Beauce and the Perche. So we must rule out ecclesiastical policy.

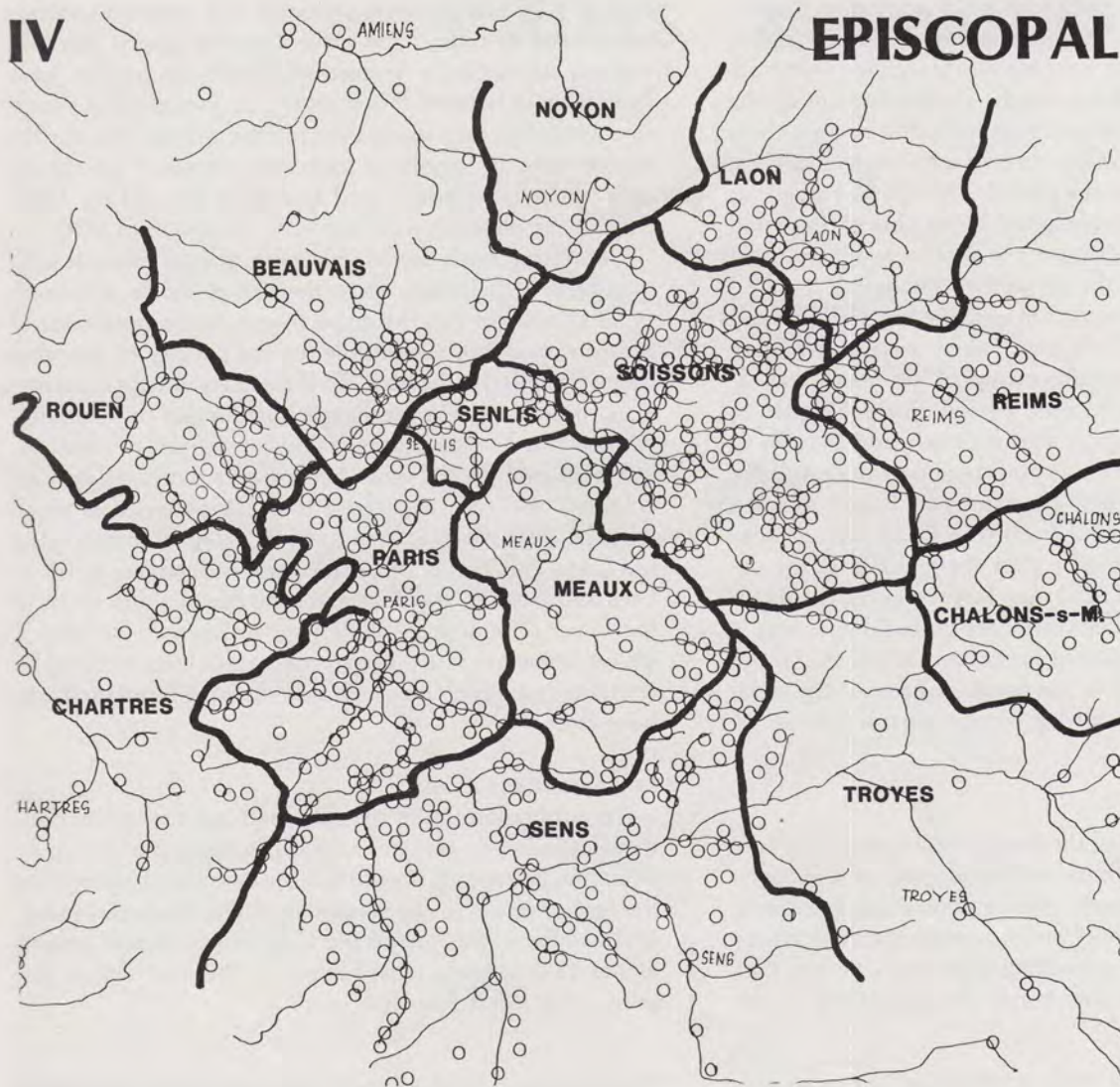
We cannot even attribute these churches to the growing seignorial power of the bishops. For in some bishoprics like Soissons where the counts had been largely overshadowed by the bishops, there was lots of building work while in other bishoprics which may have been more, if not equally independent, like Reims, Laon or Noyon, there was only scattered activity.<sup>30</sup>

<sup>28</sup> The diminished quantity of building work at either end of this period coincides with the Crusades of the 1130's and the 1240's. But those of the 1190's and 1204 coincide with the top of the boom. Construction at Chartres was at its peak when Count Louis went to Constantinople, yet funding seems to have declined while Bishop Mouzon was with his army in Toulouse — J. James, "What Price the Cathedrals?" *Transactions of the Ancient Monuments Society*, xix, 1972, 47-65.

<sup>29</sup> The boundaries are those of the 17th century, but do not seem to have changed substantially since 1100. They are drawn here from maps of Mariette and Vaugonoy (both in note 14); and L. Duval-Arnould, "État et carte du diocèse de Soissons," *Mélanges de l'École Française de Rome*,

Rome, lxxxv, 1973, 159-266; R. Kaiser, *Untersuchungen zur Geschichte der Civitas und Diözese Soissons*, Bonn, 1973; *Plans des forêts, bois, buissons ... de l'Isle de France, Brie, Perche, Picardie et Pays Reconquis*, Paris, 1668.

<sup>30</sup> Yet as the church extended its ownership, prosperity may have increased. Disputes were reduced, titles were better recognized, and administration was longstanding and well-regulated. Unlike lands belonging to lay lords which could be transferred for marriage or debts to new owners with new policies, church tenants could look forward to a continuity of effort and to stable taxes which would only encourage prosperity. Further research may permit a more accurate assessment.



Map IV The episcopal boundaries.

one reason for the Braine area being so much better stocked than the Parisis.<sup>28</sup>

There is a closer correspondence between the episcopal boundaries and the vacancies around Meaux, as can be seen in Map IV,<sup>29</sup> and between the densest collection of churches and the diocese of Soissons. Yet the group of churches to the east of Meaux belies any consistent policy by its bishops, as does the spread of churches beyond the borders of the Soissonais. Similarly, the dense zone around Mello straddles three bishoprics, two of which show little building activity elsewhere. Finally, there are very few category

1-3 buildings around Noyon, nor in the archbishopric of Sens, nor, in spite of the greatest cathedral of the age at Chartres, in the Beauce and the Perche. So we must rule out ecclesiastical policy.

We cannot even attribute these churches to the growing seigneurial power of the bishops. For in some bishoprics, like Soissons where the counts had been largely overshadowed by the bishops, there was lots of building work, while in other bishoprics which may have been more, if not equally independent, like Reims, Laon or Noyon, there was only scattered activity.<sup>30</sup>

<sup>28</sup> The diminished quantity of building work at either end of this period coincides with the Crusades of the 1130's and the 1240's. But those of the 1190's and 1204 coincide with the top of the boom. Construction at Chartres was at its peak when Count Louis went to Constantinople, yet funding seems to have declined while Bishop Mouzon was with his army in Toulouse — J. James, "What Price the Cathedrals?" *Transactions of the Ancient Monuments Society*, xix, 1972, 47-65.

<sup>29</sup> The boundaries are those of the 17th-century, but do not seem to have changed substantially since 1100. They are drawn here from maps of Marlette and Vaugonoy (both in note 14); and L. Duval-Arnauld, "État et carte du diocèse de Soissons," *Mélanges de l'École Française de Rome*,

Rome, Lxxxv, 1973, 159-266; R. Kaiser, *Untersuchungen zur Geschichte der Civitas und Diözese Soissons*, Bonn, 1973; *Plans des forests, bois, et buissons ... de l'Isle de France, Brie, Perche, Picardie et Pays Reconquis*, Paris, 1668.

<sup>30</sup> Yet as the church extended its ownership, prosperity may have increased. Disputes were reduced, titles were better recognized, and administration was longstanding and well-regulated. Unlike lands belonging to lay lords which could be transferred for marriage or debts to new owners with new policies, church tenants could look forward to a continuity of effort and to stable taxes which would only encourage prosperity. Further research may permit a more accurate assessment.



There was work on every cathedral site in the Basin.<sup>31</sup> Though all were under the jurisdiction of bishops associated with the king,<sup>32</sup> they were equally associated with trading cities whose burghers sought the protection of the Crown, and whose trading profits helped to finance these works,<sup>33</sup> as well the many important urban churches, abbeys, and collegials of the period. Though the cathedrals had the inestimable advantage of being able to impound funds from the whole diocese, the monies spent on them seem to represent only the tip of the iceberg.<sup>34</sup>

As can be seen in Fourquin's map of the territories owned by the Church in the Paris area,<sup>35</sup> there were many more churches built in the domains owned by St. Denis and St. Germain-des-Près than in those owned by the Chapter of Notre Dame. This suggests that the cathedral may have discouraged building by usurping regional funds for the benefit of its own program. The same may have happened in Reims, where nearly all the churches in the diocese seem to date from either before or after the building of the cathedral. The uprising of 1233 may have reflected the harsh way funds seem to have been raised for the building works.<sup>36</sup> In contrast, the vast building programs carried out in the diocese of Soissons and to the south of Laon at the same time as their cathedrals further emphasize the richness of this area.

### Forests and Marsh

It is thought that during the Merovingian period the forests cleared in Roman times reclaimed most of the country,<sup>37</sup> especially the uplands. As the population increased, the forests were cleared once more, starting naturally where the soil was best, and prompting Higounet's phrase that the geology of the soil determined the geography of the

forests.<sup>38</sup> By 1000, forests probably still covered twice as much land as today, and since then the largest have remained substantially untouched, while the smaller have been heavily reduced.<sup>39</sup> It must not be thought that everyone wanted to turn forest over to food production, for the woods were an important source of revenue.<sup>40</sup> All the arable and well-drained land had been cleared by 1250, though the plateaux were not fully cleared until 1700.<sup>41</sup>

Unforested areas do not, however, always coincide with quantities of buildings, as to the east of Reims and south of Chartres, nor can the dense forests to the northwest of Soissons be alone responsible for the paucity of churches there.<sup>42</sup> Similarly, the hunt did little to encourage construction, since areas like Senlis are surrounded by churches, while others like the Hurepoix and Fontainebleau have few.

Marshland, on the other hand, had a direct effect. Calculations and records suggest that almost twice as much river frontage was marsh as is found today, examples being the Seine and Yonne upstream from Montereau as far as Sens and Nogent, the Marne around Meaux, and much of the upper Oise and the Vesle west of Reims.<sup>43</sup> As Map V shows, these are just those riverine areas least serviced by churches, no matter how rich the adjoining farmlands may have been.<sup>44</sup>

### Population and Trade

Dense populations, in spite of the strong internal markets they engendered, were not necessarily in areas of high construction. Normandy was 40% more densely inhabited than the Ile-de-France, or the Soissonais.<sup>45</sup> The Plaine de France, north of Paris, was one of the most closely settled regions in the 1328 census, where some of the best wheat was grown. Yet it has few churches.<sup>46</sup>

<sup>31</sup> One third of these building efforts were instigated by fire. Six were being worked on in the 1170's, 13 around 1200, and at least ten were still being built at the end of the period.

<sup>32</sup> M. Pacaut, *Louis VII et les élections épiscopales dans le royaume de France*, Paris, 1957.

<sup>33</sup> See H. Kraus, *Gold was the Mortar*, London, 1979, whose work suggests that the cathedrals expressed the independence of the merchants, and sometimes of the bishops, from local seigneurs, intimating that the cathedrals were more a manifestation of pride and wealth than of policy.

<sup>34</sup> Incomplete estimates suggest that the cathedrals consumed less than 20% of the total expenditure on extant churches during this century. As we have lost far more smaller churches than cathedrals or even parts of them, the cathedrals represent a relatively small proportion of the total spent on religious architecture.

<sup>35</sup> Fourquin, 1964, map IV, is from the end of the Middle Ages. My sentence applies after deleting later acquisitions. See Kraus (as in note 33), 25-26.

<sup>36</sup> H. Reinhardt, *Cathédrale de Reims*, Paris, 1963, 72-74, and R. Branner, "Historical Aspects of the Reconstruction of Reims cathedral, 1210-1241," *Speculum*, 1961, 23-37. There are only four churches in the rest of the diocese that had work done on them while work on the cathedral was in progress — Villers-aux-Noeuds around 1215, and Crugny, Pevy, and Prouilly in the thirties.

<sup>37</sup> Higounet, 1965, 53. In a more conservative study, it was considered that only one third was forested in the 10th century — M. Devèze, *La Vie de la forêt française au XVI<sup>e</sup> siècle*, Paris, 1961.

<sup>38</sup> Higounet, 1975, 45. See Roblin, 1978, 263.

<sup>39</sup> Exceptions can be found in Brunet, Devèze (as in note 37), and Moreau-Nélaton, 1911 (as in note 13), 145. A study of the oldest maps shows that the great hunting parks are substantially as they were in the 1650's — see the Ainville collection, *Les Forêts de France*, Bibliothèque Nationale, Paris; *Carte archéologique de la France*, Orléans, 1948, and other maps cited in note 14. M. Devèze, *Histoire des forêts*, Paris, 1973, 268, gives today's forest cover as 18%.

<sup>40</sup> The king raised one quarter of his income from forests — Devèze, *ibid.*, 64, and G. Fourquin, *La Part de forêt dans les ressources d'un grand seigneur d'Ile-de-France à la fin du XIII<sup>e</sup> siècle et au XIV<sup>e</sup> siècle*, Paris, 1970.

<sup>41</sup> Robert Fossier in conversation. Largely unnoted are scrub-lands which would support neither forest nor agriculture.

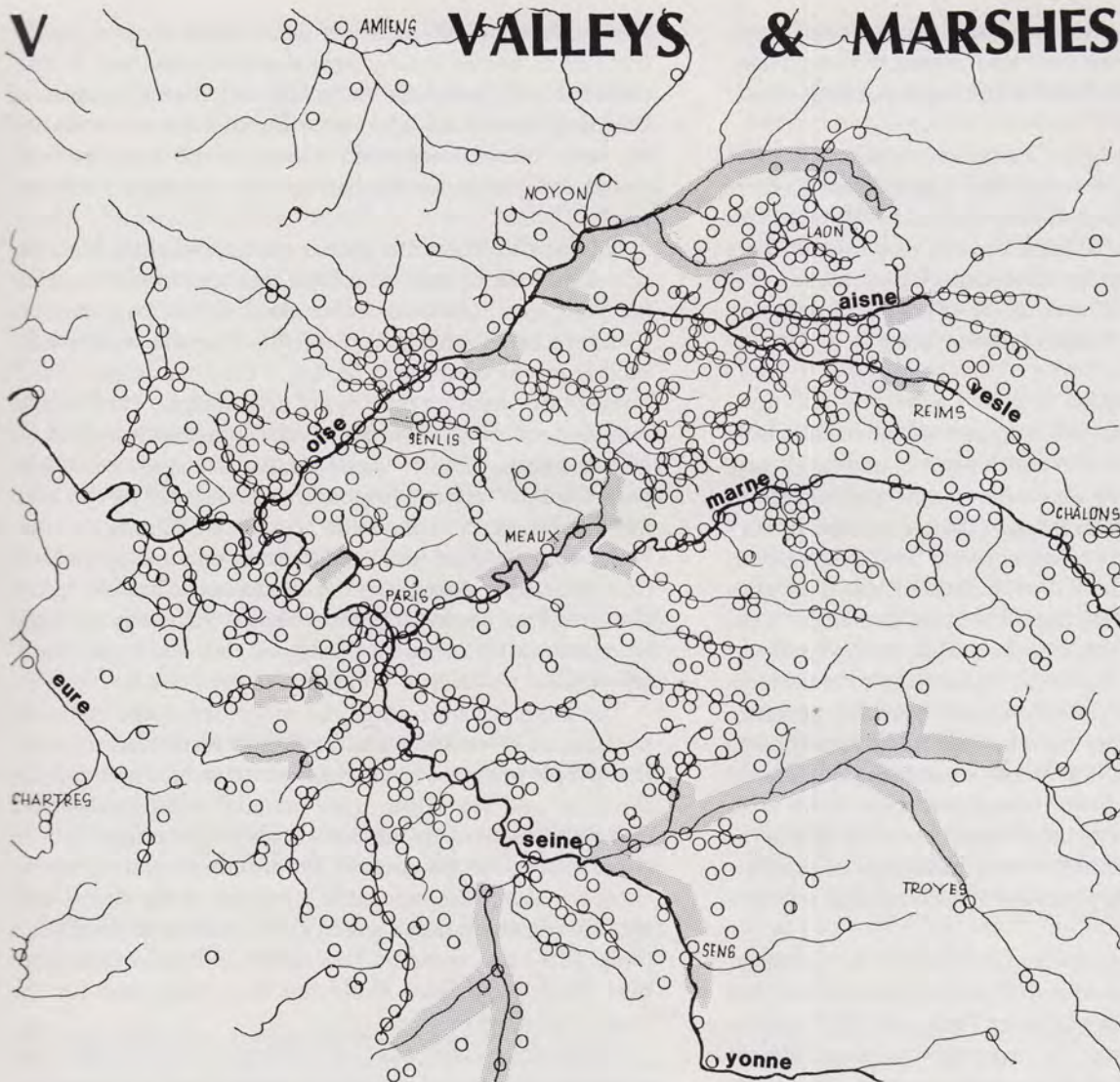
<sup>42</sup> See note 90.

<sup>43</sup> Prepared from Fourquin, 1964, 60; Roblin, 1978, 254, and an examination of those river flats which today rely on drainage for their usefulness, based on maps at the Institut Géographique National, St. Mandé, Paris.

<sup>44</sup> This shows how essential fertile valleys were to the successful villages of 1200. Meaux and Bray-sur-Seine may owe their importance to roads and firm crossings rather than to profitable agriculture.

<sup>45</sup> Dupaquier, 1969, 981.

<sup>46</sup> Fourquin, 1956, 63-64, notes the number of hearths per hectare at nineteen in La France, ten-twelve in the Vexin, sixteen along the Seine south of Paris and only six-nine in the Hurepoix. Also P. Brunet, "Essai sur le peuplement de la Brie," *Bulletin de l'Association des Géographes Français*, 1953, 161-69.



Map v The river valleys, with major navigable rivers marked more clearly. Marshlands are shaded.

On the other hand, sparse populations and lack of churches do go together, as in the Hurepoix, and around Bourges and Troyes — although poor soil may also have been responsible.

Total population is hard to estimate, though we can count communes or hearths to gain some idea of relative densities. The hearth seems to have represented both the numbers of people and wealth. It was a sort of fiscal coefficient.<sup>48</sup> Using a factor of 4 to 4.5 people per hearth, the population of France — the smaller France of medieval times — may not have been far from 12 million in 1328, and maybe 9 million in 1200.<sup>49</sup> The Paris Basin may have supported a quarter of these people.

<sup>47</sup> Fourquin, 1964; R. Fossier, "La Démographie médiévale: Problèmes de méthode (x<sup>e</sup>-xiii<sup>e</sup> siècle)," *Annales de démographie historique*, 1975, 144-165; and *idem*, *Peuplement de la France du nord entre le X<sup>e</sup> et le XVI<sup>e</sup> siècle*, Paris, 1979, 59-99.

<sup>48</sup> Lot (as in note 15), 289.

<sup>49</sup> Fourquin, 1956, 63-67.

<sup>50</sup> Duby and Wallon, 403.

<sup>51</sup> Dupaquier, 991, states that in the 18th century, towns like Melun and Etampes had a quarter of the number of hearths of Chartres or Beauvais,

Whatever the actual population of the Basin may have been, the absolute figure is less important than its growth, for between 1100 and 1348 it is estimated that the population increased some threefold.<sup>50</sup> Yet there is no direct correlation between population growth and prosperity. Even the growth of Paris may not indicate a general prosperity, for the very presence of this huge agglomeration seems to have made nearby towns anemic.<sup>51</sup>

There were a few areas of manufacture in the Paris Basin, especially weaving. Along the Thierace, weaving had been practiced since ancient times, in an area that extended north through Amiens to Flanders. Yet the churches are only found in the southernmost portion of the weaving district.<sup>52</sup>

which were themselves a lot smaller than cities farther away from Paris like Rouen and Orleans. The increasingly visible tendency of Paris to monopolize all secondary and tertiary activity in the Ile-de-France would have been present in the 13th century, though impossible to quantify. As trade was increasingly concentrated at Paris, smaller towns would have lost some of their earlier importance, which may be seen in the interrupted building campaigns at Lagny and Chennévières.

<sup>52</sup> The dense population along the Thierace to Beauvais and north to Amiens does not coincide with the churches. See P. Feuchis, "Une Tentative manquée de concentration territoriale entre Somme et Seine: La Principauté d'Amiens-Valois au XI<sup>e</sup>," *Moyen Age*, LX, 1954, 1-37.

Save perhaps in the major towns, industry was not therefore a primary influence on construction,<sup>53</sup> though successful manufacture may have encouraged building once it was initiated.<sup>54</sup>

The fairs held in the four Champagne trading towns of Troyes, Bar-sur-Aube, Provins, and Lagny seem to have encouraged some buildings in their immediate vicinity. This is particularly apparent around the last two towns where a few satellite buildings are surrounded by emptiness. It is surprising that these trading areas, like Paris, lie to the south of the most important church-building areas.

### Roads, Rivers, and Bridges

The ballasted Roman roads appear to have had little maintenance before the eleventh century, and over long stretches they may have become unusable and unable to play a major part in medieval trade. Dead-ended paths may have been frequent, but total isolation would have been rare indeed. Bridle tracks linked every settlement, no matter how small,<sup>55</sup> for the collection of taxes and administration, and well-worn wagon tracks joined every hamlet or farmhouse to the outlying fields.<sup>56</sup> Most roads would have been dirt,<sup>57</sup> and as in the country today the greater the traffic the worse the wear. Since travelers would have tended to select the better paths, the roads were being constantly modified,<sup>58</sup> often enough to bypass one town in favor of another.<sup>59</sup> Local prosperity could have depended on the vagaries of these roads. Churches may have been begun during the days of prosperity, never to be completed once the road had shifted.

A walking pace was probably the mean for the transport of goods, though the distance covered by horse varied from forty-five kilometers a day between Paris and Lille to eighty between Paris and Tours. The average was some fifty-six kilometers a day.<sup>60</sup> It would have taken no more than three days to cross from one extremity of the Paris Basin to the

other. Masons and carpenters could have moved rapidly from their homes to any site. But the movement of materials would have been more difficult, though improved breeding enabled a high proportion of trade to be carried by pack animals, especially mules, which may have reduced dependence on the cart and the necessity for better roads.<sup>61</sup>

Smaller churches with limited resources seem to have obtained the bulk of their stone from local quarries,<sup>62</sup> but stone for the bigger jobs often came great distances, and could therefore be selected with care. St. Quentin is reputedly built from the quarries of St. Leu-d'Esserent on the Oise.<sup>63</sup> Some of the stone for the Royal Portal sculpture at Chartres was shipped some three hundred kilometers from the St. Maximum quarries;<sup>64</sup> the stone for Bourges was transported from quarries eight, seventeen and thirty-eight kilometers distant.<sup>65</sup> Though the cost of land transport was high, work on these giant buildings does not seem to have been noticeably discouraged by this financial burden.<sup>66</sup> And if a road was needed, the most skilled men were on hand to construct it. So we can only say that the roads themselves were no limit to building.

The larger rivers formed the major transport links, especially for stone and wine. Traffic by water was so cheap that people preferred to use the best water-borne stone from the Oise and the Aisne than material from land-locked quarries a tenth of the distance away.<sup>67</sup> The importance of these rivers can be seen in the numbers of interesting churches along the navigable stretches of the Seine, and considering the relative paucity of churches in the Paris basin (only 32%) one wonders how many of these would have been built if the Seine could not have been used for the cheap transport of stone.

In practice a river was just a different sort of road, and economically, a road may have merely been the means of getting from one river system to another. Few of the smaller

<sup>53</sup> Kraus (as in note 33); Lopez; White.

<sup>54</sup> Scale is important. Troyes is called a weaving city, yet its 2,000 lots annually cannot be compared to 50,000 from Ghent. The whole of the Troyes production could have come from 40 looms.

<sup>55</sup> This can be seen in maps such as Cassini (as in note 14). Also C. Estienne, *La Guide des chemins de France*, Paris, 1552; J. Hubert, "Les Routes de France depuis les origines jusqu'au nos jours," *Les Routes du Moyen Age*, Paris, 1959, 25-56; J. Mesqui, *Les Routes et les voies en Champagne du moyen âge*, Paris, 1980.

<sup>56</sup> Roblin, 1978, 247: the maximum distance from home to field was two kilometers, both for safety and lunch.

<sup>57</sup> Forbes, 1957, and Roblin, 1978.

<sup>58</sup> R. H. Bautier, "Recherches sur les routes de l'Europe médiévale," *Bulletin philosophique et historique etc.*, 1960, 99-143; M. F. Imbardis, "Les Routes médiévales coïncident-elles avec les voies romaines?," *Bulletin philosophique et historique*, 1960, 95-98.

<sup>59</sup> Imbardis, *ibid.*, 97; Lopez. Brigandage may have been a factor.

<sup>60</sup> Bautier (as in note 58), 112.

<sup>61</sup> Lopez, 80.

<sup>62</sup> See the discussion of quarries below.

<sup>63</sup> Bondeau and Viré in conversation.

<sup>64</sup> James, 1981, 1, 83.

<sup>65</sup> A Blanc, S. Debrand-Passard, P. Leboutoux, "Les Matériaux de construction de la cathédrale de Bourges et leurs provenances," *Bulletin d'information géologique du bassin parisien*, 1980. They show that the lucastré from St. Ursin was used for the walls of the crypt, the façade, buttresses, and probably the footings; stone for detailing seems to have come from St. Florent or Dogger, while sculpture was carved from Charly material. Transport may have been along the remnants of the Roman roads.

<sup>66</sup> Gimpel, 61, suggests that 20 kilometers by road would have doubled the cost of the stone.

<sup>67</sup> F. Ellenberger, M. Viré, J. Marvy, *Les Anciennes Carrières souterraines de Paris*, Thesis, Paris I, 1978; Forbes. French researchers suggest that the stone for Notre Dame in Paris came from the open-cut quarries of St. Leu-d'Esserent rather than from the underground workings of Arcueil and Gentilly which produced a similar stone only ten kilometers away. Gimpel, 60, contradicts this. Along the major rivers, many churches have been built of more than one type of stone from as far away as Normandy and Burgundy. See note 65.

ivers were navigable, and were too easily restricted with mills<sup>68</sup> and low country bridges.

Bridges may not have limited the supply of materials, for there were at least eighty in the Paris Basin before 1300, and where there were none there were often ferries and fords.<sup>69</sup> In spite of the rich valleys and agriculture around Paris, the wealth of the capital, it is said, came from its rivers.<sup>70</sup> The distribution of the better churches in Map I shows that for the west and south (though not in the Soissonais), nearly every interesting building lies a short distance from one of the major navigable rivers.

### Agriculture

Map V shows the one factor that applies to nearly all the buildings of our period: they lie along the river valleys and not on the plateaux. This is especially true in the north where the valley walls are steeper than in the more gently rolling south. The advantages of the valleys are:

the lighter soil, largely of fertile limon eroded from the uplands, mixed with sands and constantly washed with leachings from above, while the limon on the plateaux is less porous and heavier to work,<sup>71</sup> and is also liable to desiccation when dry;<sup>72</sup>

the excellent drainage, unlike the uplands;<sup>73</sup>

the noticeably warmer temperatures, and protection from the harsh winds;

the constantly flowing water for mills and fishponds;<sup>74</sup>

the people seem to have been healthier and the population was greater;<sup>75</sup>

rheumatism may have been common on the damper higher ground;

<sup>68</sup> Though windmills were being installed after the mid-12th century, most were water-driven, making transport up the smaller rivers difficult if not impossible — A. M. Bautier, "Les Plus Anciennes Mentions des moulins hydrauliques industriels et des moulins à vent," *Bulletin philologique et historique du comité des travaux historiques et scientifiques*, 1960, 567-626; Roblin, 1978, 246; White, 1964, 84. However, the benefits from the mills in metalworking, fulling, and sawing (of both wood and stone) may have offset the higher cost of transport. G. Duby, "La Révolution agricole médiévale," *Revue de géographie de Lyon*, xxix, 1954, 359-65; White, 1964.

<sup>69</sup> M. N. Boyer, *Medieval French Bridges*, Cambridge, Mass., 1976; Forbes.

<sup>70</sup> Fourquin, 1964, 62, which makes it more surprising that Paris was less able to build as many quality churches as the Soissonais. Maybe the people of the countryside did not share in the prosperity of the capital.

<sup>71</sup> J. Dupuis, *Notice explicative de la carte pédologique de la France au millionième*, Paris, 1967; and discussions at INRA (as in note 1). Calcium carbonate in the younger limon is leached downwards with the smaller particles. The latter settle in the crevices between the larger grains to form clays. As the clays become dense, the leaching stops, the soils become acidic, and lakes form making the earth poor for agriculture. However, the younger limons have produced some of the best farming lands in France as the roots follow the moisture into the leached carbonates which they bring back to the surface so the cycle can begin again. This process continues until the natural formation of the clays ends it for all time.

<sup>72</sup> Roblin, 1978, 260. See "Possible Answers" at the end of this article.

<sup>73</sup> There was little investment in drainage before the 16th century, though the techniques were known from Roman times. Fourquin, 1964, 75.

<sup>74</sup> Roblin, 1978, 246. Jean Jacquart and François Bucher in discussion.

<sup>75</sup> Dupaquier, 1969, 987.

the small capital required for agriculture as the lighter soils could be worked by wooden scratch ploughs drawn by a single animal.<sup>76</sup> The heavier plateau soils required more expensive equipment and more animals to draw them.<sup>77</sup>

Nevertheless, the fertile limons were extensively cultivated and brought great riches to their proprietors,<sup>78</sup> but as Maps I and V show, during this century the plateau farmers seldom built churches that have lasted.

Even on the best soils to the north of Paris, there are few churches. Because these plateau soils were heavy, farmers had to use the expensive wheeled moldboard plough, or *charrue*, and large teams of horses, for which they reorganized the field boundaries.<sup>79</sup> Only large land owners could do this, so men were employed for a wage. By contrast, in the valleys the smallholders and *vignerons* could own their own tools and keep some of the profits from their labor.<sup>80</sup> As the plateau yields were so much higher than those of the valley,<sup>81</sup> one looks for some social force to provide an explanation for the higher incidence of churches in the valleys. It may be that where farmers could avoid having to work for a wage and so were able to keep a part of their produce, enough funds were generated locally to pay for new churches.

The best limons lie to the north and west of the Marne, the worst to the south and east,<sup>82</sup> and it is significant that the area without churches lies astride both types of soil.<sup>83</sup> Similarly, the better limons extend across the densest area of churches in the Soissonais and across the thinnest around Beauvais and Chartres.<sup>84</sup> So here soil is not the major factor.

<sup>76</sup> Horses were in common use in northern France by the 13th century — White, 1964, 64-65. They greatly improved the yield and the amount of work each man could achieve in a day — Forbes, 1955, 83; White, 1964, 68, suggests that the horse allowed people to live farther from their work, permitting towns to be enlarged. Costs for horses have been variously estimated as being as much as four times that of oxen — Duby and Wallon, 413, and Lopez, 46.

<sup>77</sup> Brunet, 1960; Duby and Wallon; Duby (as in note 68), and *idem*, *Medieval Agriculture, 900-1500*, London, 1969; Fourquin, 1956, 69f; White.

<sup>78</sup> A. J. Bourde, *Agronomie et agronomes en France au XVIII<sup>e</sup> siècle*, Paris, 1967; Fourquin, 1964, 8.

<sup>79</sup> Photography has shown that valley fields were one-two acres in extent, while those on the plateau were expanded to five acres, with some up to 40 acres. Duby and Wallon, 409; Fourquin, 1964, 73-75; Higounet, 1975, 75; White, 1964, 47.

<sup>80</sup> Duby and Wallon, 410; Higounet, 1975, 75.

<sup>81</sup> By 1300 yields had increased from two and a half grains for one in Carolingian times to three and even four, to be exceeded in the Plaine de France by as much as seven for one. Duby and Wallon, 462.

<sup>82</sup> No two maps agree on the extent of the limon but, excluding a crescent through Troyes and Reims, it covers most of the higher ground over both the chalk and the limestone. South of the A4 and east of Fontainebleau it is impermeable, and it is more or less acidic between the Marne and the Morin — see note 77. The maps all agree on the poorer soils of the Oise forests, the Noyon area, the Hurepoix, and the Brie. Ministère de l'Industrie, *Cartes Pédologiques de la France*, Paris, 1967, and the Centre National de Recherches Agronomiques, INRA, Versailles.

<sup>83</sup> Fourquin, 1964; 60; Roblin, 1978, 270.

<sup>84</sup> A. Chédeville, *Chartres et ses campagnes, XI<sup>e</sup>-XIII<sup>e</sup> siècle*, Paris, 1973.

The churches along the Essonne may owe their existence to the profits from agriculture supplemented by weaving and good quarries.<sup>85</sup> Conversely, the poor dry lands of the Aube and Epernay supported few people and even fewer churches. Much of southern Picardy is similar, with a sylvan landscape with many small forests and little intensive agriculture.<sup>86</sup> In the Hurepoix and around Fontainebleau the soils are poor, sandy, damp, and lacking in limon. Their populations have always been small.<sup>87</sup> They remained covered in forest until the building of royal palaces and the expansion of the metropolis.

If the people in the Brie and to the north and east of Paris built churches, they must have been very simple,<sup>88</sup> for most were rebuilt after 1600 as the land was drained.<sup>89</sup> To the west and north of Soissons the soil is good, and there are both forests and churches, albeit simpler ones. However, the valleys are narrow and changes in climate could have had a profound effect on the viability of the region.<sup>90</sup> The same may apply to the region southwest of the Hurepoix in the Perche where there are few churches after 1200, but many built before.

Thus, one can say that the soil in itself appears to be only a contributory factor, for it cannot explain the dearth of churches in the areas where the limon is extremely fertile, nor the absence of churches around Meaux where there is both good and bad soil. Nor does it explain the general density within the Paris Basin, and the small numbers to be found beyond that. Certainly, we can conclude that within the Basin the churches are the product of the valleys, and of valley agriculture rather than of large-scale plateau farming. We can also see that poor soil and church building do not go together. If on one map we set out all the deleterious influences — marsh, forest, acidic soils, damp, and so on — we will still not have explained those positive forces

which produced the dense concentrations of churches in the Oise and the Soissonais. However, there is one factor that does coincide precisely with these churches and that is stone.<sup>91</sup>

### Limestone and Quarries

An island of tertiary limestone called *calcaire* covers much of the Paris Basin, lying within a sea of secondary chalk stretching from Dunkirk to Nevers and Le Mans to Verdun — some 450 kilometers in each direction.<sup>92</sup>

Most of the chalk is soft, white, and fine-textured. Like all sedimentary stones, it begins to harden after a few days' exposure to the air, until it becomes more or less impermeable. On the whole, it is a softer stone than *calcaire*, easily worked and sometimes weathering badly. The cathedrals of Beauvais, Amiens, and Le Mans are all built of it, as well as most of the churches in the chalk country.

The *calcaire* is harder than chalk, of varying shades of yellow, with an even perceptible grain, and usually containing fossils. Masons consider the *calcaire grossier*, or *vergelé*, the finest for building and sculpture. It is an exquisite stone to work, capable of taking a razor-like edge and holding it under the chisel, while hardening evenly so that the best will retain its sharpness and detail after centuries of weathering.

The boundary of the Early Gothic churches coincides almost exactly with that of the *calcaire*, as shown in Map VI, while the densest concentration of buildings along the Oise and the Soissonais lies over the *grossier*. *Grossier* is the stone of Gothic. One is not conceivable without the other. It is the conjunction of *grossier* with the valleys which provides the best correlation so far.

The best layers of *grossier* were laid down while a tongue of the Lutetian sea covered part of northwest France.<sup>93</sup> Its

<sup>85</sup> In conversation Cambeillare suggested that here farmers combined grazing with cropping, using the excrement of the one and the straw from the other to produce a compost that greatly enriched the soil. Were these techniques used only here?

<sup>86</sup> Roblin, 1978, 275.

<sup>87</sup> See note 46.

<sup>88</sup> There are almost no fourth category churches around Meaux today, suggesting that any built around 1200 were of wood, plaster, and rubble. No wooden ones remain, though there are over 20 in the forests west of the Rhine. This suggests that if of wood, then they were insubstantial. If not used with care, rubble cracks so that moisture and frost will soon render it unusable — possibly the use of rubble is one factor in the rebuilding that followed the "mini ice age" — see the section on "Possible Answers."

<sup>89</sup> Roblin, 1951, 234; Duby and Wallon, 400; and conversation with Jean Jacquart.

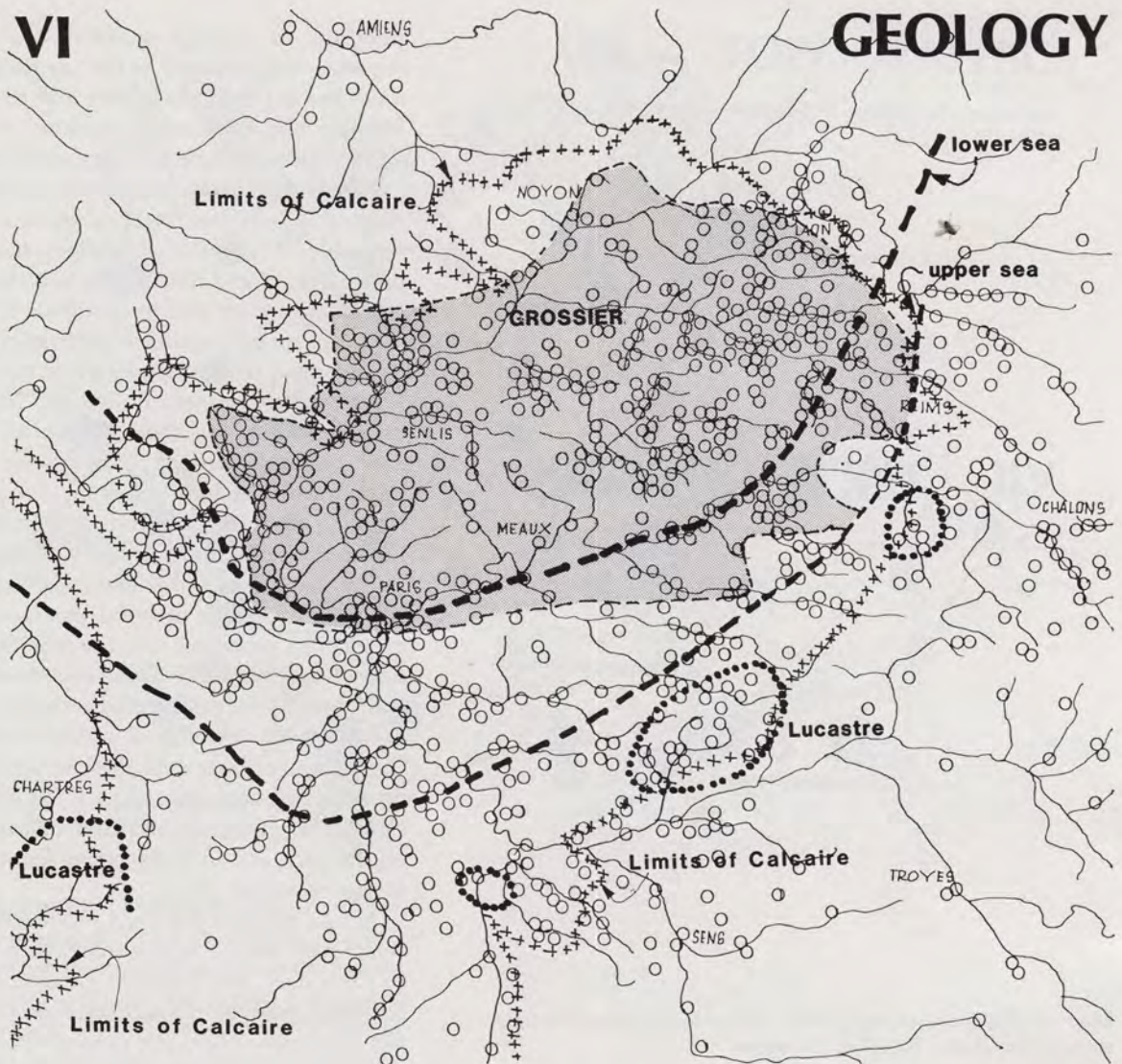
<sup>90</sup> Roblin, 1978, 273. There are 40-odd Romanesque buildings along the Thierace, Breche, Autumne, and the Aisne west of Soissons being studied by Danielle Johnson. After 1150 work was carried out on a further 34 along the western rivers, and 16 along the Autumne, showing a continuity of cash flow and enthusiasm seldom found elsewhere. However, in the Mello region the later work is usually larger and more carefully detailed than that to the east. The former may have been funded by the income from weaving and quarrying, while prosperity in the latter may have been

restricted by dryness or the narrowness of the valleys — see last three paragraphs in text.

<sup>91</sup> The flat lands around Reims and Châlons-sur-Marne, in the Beauce and the western Gâtinais, are exceptional. The many churches from this period have simple forms and profiles, are built mainly of rubble, and were erected slowly over many campaigns. The builders were less skilled than almost any of those working in the north. Not only is there little decoration, but even the capitals are cruder than one should expect from this stone, even the hardest. One wonders what encouraged the superlative craftsmanship and architectural sophistication of the north. They are solid and unadventurous. Innovation is rare, so it may not be surprising that the more ambitious clients sought their builders from the north, as Chartres, Larchant, and Orbais. The numbers of simpler churches in these flat lands highlight the few to be found in the Meaux, and in the rich areas of the Plaine de France.

<sup>92</sup> A. Blondeau, *Le Lutétien des Bassins de Paris ... Étude sédimentologique et paléontologique*, Thesis, Paris, 1965; L. Morellet, "Le Bartonien du Bassin de Paris," *Mémoires explicatives de la carte archéologique de la France*, Orleans, 1948; C. Pomerol, ed., *Guides géologiques régionaux*, Paris, 1968.

<sup>93</sup> Often called the Nordic Sea. The *grossier* was the product of the lower Lutétien, as can be seen in Map VII. The various layers of limestone of Provins, St. Ouen, Champigny, Brie, and Beauce were laid down in later seas.



Map VI The geology of the Paris Basin, with the *grossier* substratum shaded. The limits of the Lutétien seas are dashed, and may be compared to Map VII. The outcrops of *lucastre* are dotted. The boundary between the surface limestone and the chalk is delineated with a line of crosses. Major source Blondeau (as in note 92), 398.

southern boundary coincides with the escarpments of the Marne, and continues under the sedimentary rocks of Paris, being exposed in an outcrop to the south of the city.<sup>94</sup>

Above and to the south of the *grossier*, the geologically later beds vary considerably, and though none comes close to the quality of the *vergelé*, some make good building

<sup>94</sup> These descriptions are taken from the Cartes Géologique de la France, printed by the Ministère de l'Industrie. The description of the *grossier* comes from map 33: "C'est un ensemble de calcaires ordinairement jaune clair, tendres, mais durcissant à l'air, homogènes, à stratification régulière et dans lesquels sont creusées une multitude de carrières souterraines qui fournissent la plus grande partie des matériaux de construction. Les bancs supérieures à *Cardium aviculare*, ordinairement exploités à ciel ouvert, fournissent d'excellents moellons. Au-dessous, les galeries souterraines sont ouvertes tantôt dans les couches à *Cerithium giganteum* sur 2,50 à 4 mètres de hauteur, tantôt dans les assises à *Ditrupa strangulata*, de puissance au moins égale. Plus bas, les couches à *Nummulites laevigatus*, *Marettia grignonensis* et *Pygorhynchus grignonensis*, moins homogènes, souvent noduleuses, ne donnent plus de pierres d'appareil, mais fournissent des moellons de bonne qualité. Elles reposent sur des bancs de calcaire rosé, compact et très dur, qu'on emploie à l'empierrement des routes."

Not all *grossier* is suitable for building, and even the best of it degrades when near the surface. These surface outcrops lie along its northwest fron-

stone, if not the best capitals or details.

The beds of *lucastre* around Provins,<sup>95</sup> which reappear near Bourges<sup>96</sup> and south of Chartres,<sup>97</sup> also continue westwards with usable outcrops near Château-Landon<sup>98</sup> and Champigny.<sup>99</sup> Building stone was quarried from all of these beds during the Middle Ages, although it is harder to work

tier, and the more degraded coincide with the relatively infertile forested areas like the Bois des Côtes and the Forêt de Hez on either side of Cleremont.

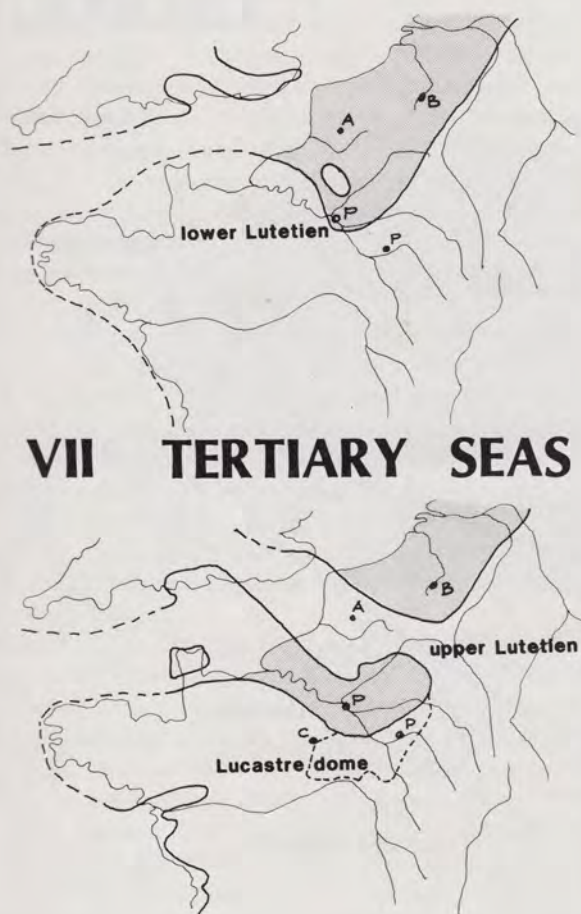
<sup>95</sup> Map 66: "Un série de bancs calcaires à grain fin, à cassure conchoïdale, entre lesquels s'intercalent des lits de marne; de couches bréchoïdes sont subordonnées à ces calcaires. Épaisseur totale 15-18 mètres."

<sup>96</sup> See note 70.

<sup>97</sup> James, 1981, I, 89.

<sup>98</sup> Map 80: "Un calcaire-grisâtre à quelques tubulures vermiculées, dur mais assez fragile, en bancs réglés de quelques décimètres; son épaisseur va de 10 à 25 mètres."

<sup>99</sup> Map 65: "Un masse épaisse de calcaire blanchâtre, siliceux, bréchoïde, à veinules cristallines, parfois siliceux, très dur et avec rognons de calcédoine ... va de 20 à 40 mètres ... il donne à la fois une bonne pierre à chaux et une pierre de construction utilisable."



Map VII The limits of the Lutétien seas which created the limestone of the Basin. Based on Blondeau.

than *grossier* and not as capable of holding details.<sup>100</sup> The beds of Château-Landon and Champigny are exceptional

<sup>100</sup> Stone could have been exported from these quarries, though it was not as tractable as the *grossier*. The income from this export may have helped to support construction in these regions, perhaps aided by the fairs (Provins), weaving (Essonne valley and Chartres), and pilgrimages.

<sup>101</sup> Map 66: "Au nord, elle comprend des alternances de marnes et de puissants bancs de gypse; au sud, une masse compacte de calcaire siliceux ... puissante de 20 à 25 mètres, se présente tantôt sous la forme d'un calcaire blanc avec nodules de silex, exploité pour la fabrication de la chaux, tantôt d'un calcaire siliceux très dur, avec géodes de calcédoine, fournissant des matériaux d'empierrement."

<sup>102</sup> In some eastern areas it lies near the surface where, like the *grossier*, it has become degraded.

<sup>103</sup> Map 49: "Des marnes blanches, empâtant de gros silex noirs, des marnes magnésiennes violacées et des calcaires marneux. Les marnes sont exploitées pour l'agriculture, les silex et calcaires siliceux fournissent des matériaux d'empierrement et des moellons," for the area north of Meaux, and to the south "une série d'alternances de calcaires plus ou moins siliceux, de marnes blanches ou vertes, et d'argiles brunes, d'une puissance de 15 à 25 mètres."

<sup>104</sup> Map 49: "Une argile grisâtre ou rougeâtre empâtant des blocs irréguliers de meulière caverneuse jaune grisâtre."

portions of a large mass of *travertin* or *bartonien superieur*<sup>101</sup> laid down in the sea shown in Map VII. This mass lies between the Marne and the Seine, and between Épernay and the eastern outskirts of Paris. It is exposed and accessible from nearly every valley, but in varied quality.<sup>102</sup>

Above this, and covering most of the Valois plateau including Meaux, lies the St. Ouen stone,<sup>103</sup> which is totally unusable. Above the Champigny lies the sandier *calcaire* of the Brie,<sup>104</sup> and this merges into the harder layers of the Beauce, which are also too obdurate to use, save for paving.

Except for an important outcrop of *grossier* to the south of Paris, and of Champigny *travertin* to the east, the Seine-Marne valley between Poissy and Meaux consists of sedimentary sands and clays. Along this line the bedrock has sunk to form a trough, burying the *calcaire* under some thirty meters of later material. The absence of accessible building stone may explain why there are so few churches to the northeast and southwest of the metropolis.<sup>105</sup>

The stone was sometimes quarried in open cut, but as the most accessible material was worked out, the quarrymen began tunneling into the hillsides to avoid removing tons of overburden.<sup>106</sup> These subterranean workings are extraordinarily extensive, and were dug into the mountains as far as moisture and poor circulation of air would permit.<sup>107</sup>

The level ceilings over these tunnels were first supported on pillars of unexcavated rock left between the workings, but this was wasteful and later centuries learned to extract all the rock and to build pillars from the inferior stone as it was extracted.<sup>108</sup>

Across much of the Paris Basin, as Map VIII shows, the rivers have been able to work their way through the strata to form deep and irregular valleys, eroded to a level determined more by the estuary level than any intrinsic barrier of nature. Along the sides of the escarpments flanking the valleys, the bands of *calcaire* have been exposed to view.

Map VIII of the Braine district shows that nearly every church lies just beneath the level of the exposed *grossier*, and within a hundred meters or so from where it could have

<sup>105</sup> A band of Gypsum Ludien lies to the north of the Seine which makes a waterproof plaster. It was seldom used where ashlar buildings could be built of *grossier*, as marked on Map IX. But where there seem to have been limited funds for building, plaster was the best material available. The surviving buildings show that no templates were required, no geometry was needed from the master, and little design skill. Its presence may, paradoxically, have retarded the development of those ideas and skills which produced Gothic: What the potato was to Irish culture, plaster may have been to the medieval architect.

<sup>106</sup> Ellenberger (as in note 67); Roblin, 1978, 248, and in discussion with Anne Blanc, Tourtebatte, Benoit, Chapelot, and Viré. Sometimes stone was accessed through vertical shafts, as at Chamigny, Laversines, and St. Rémi.

<sup>107</sup> Gimpel, Chap. 11, and White. It would be interesting to know what these quarries contributed to the mining expertise of the Middle Ages.

<sup>108</sup> P. Noël, *La Pierre dans le Département de l'Oise*, Noyon, 1950, and *idem*, *La Pierre matériau du passé et de l'avenir*, n.d., n.p.; C. Pomerol, "France, introduction à la géologie du Bassin de Paris," *XXVI Congrès Géologique International*, Paris, 1980; P. Tourtebatte, *Réflexions sur la topographie des souterrains de l'ancienne Abbaye Saint Rémi de Reims et ceux de l'ancien collège des Jésuites*, private printing, Reims, 1981. Quarries for many village churches need not have been large, and many could have disappeared totally.

## VIII TOPOGRAPHIC



Map VIII Detailed topography of part of the Aisne and Vesle rivers between Soissons and Reims, showing the valleys, and in heavy line the contour along the escarpments where the beds of *grossier* are visible. Notice how close they are to the majority of churches, shown in black dots.

been mined on the escarpments.<sup>109</sup> (See drawing 1.) Delivery would often have been downhill by trolley or chute.<sup>110</sup> We do not know whether these buildings were built from the nearest quarry,<sup>111</sup> but in the *grossier* region almost any bank could have been used, even if small quantities of some better material had to be imported for hard-wearing surfaces, capitals, or sculpture.

A careful examination of Map VIII shows how universal this phenomenon is, and demonstrates that any distance from stone yard to site dampened the urge to build. It seems to be as clear and fundamental as that.

The large central plateau around Meaux without churches lies in the middle of the *grossier*, but is here overlaid with more than ten meters of hard St. Ouen and Brie, strata that are so dense that the rivers were unable to erode their way through the surface. They have left a softly undulating countryside under which the *grossier* has remained unseen and inaccessible. Its inaccessibility, in conjunction with the lack of valleys and peasant agriculture, seems to have stopped nearly all building.<sup>112</sup>



Drawing 1 Section through a typical valley, showing the steep escarpment between it and the plateau, the beds of *grossier*, and the usual relationship between the quarry and the nearby village church.

South of the Marne, the *bartonien* is visible along many of the escarpments, but a large proportion of the ribs, caps, and the like, seem to have been cut from *grossier* which often had to be carried great distances. The consequences can be most clearly seen in the distribution of churches built

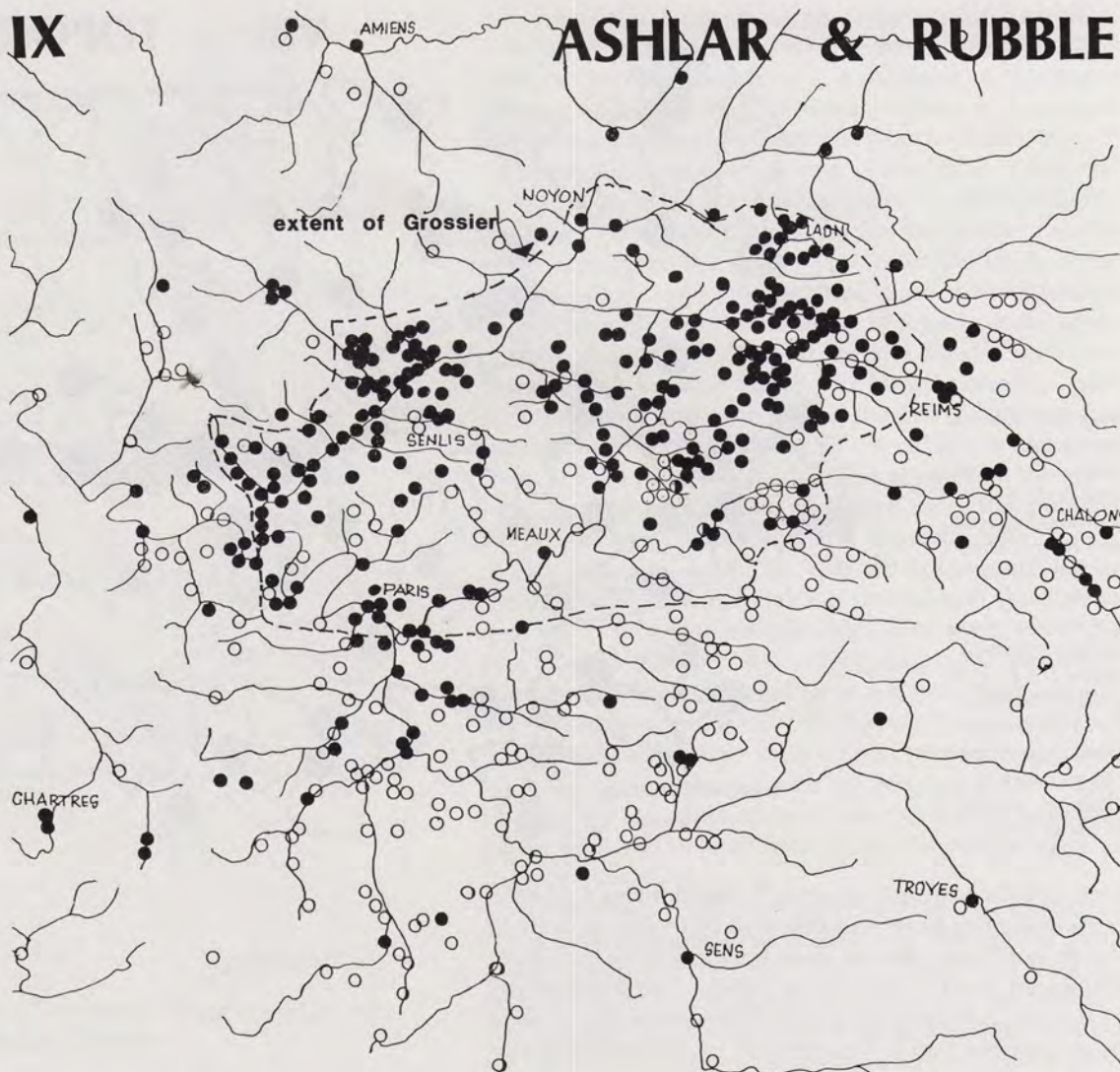
<sup>109</sup> The same stone is to be found in the adjoining villages, suggesting that the location of the villages was as influenced by the easy availability of stone as was that of the churches. The caverns excavated during quarrying are still used for storage. The exceptions are usually only the larger churches, like Braine and most of the cathedrals. Their size shows they could afford the transport.

<sup>110</sup> This supports the earlier statement that the lack of roads was not a serious barrier to construction.

<sup>111</sup> It is seldom possible to judge by eye whether the stone in a building comes from one site. Not only were there a number of bands of stone extracted from each quarry, but their characteristics change from one part of the quarry to another so that one may conclude that the stones used in 1200 may have been worked out. The *Équipe d'Histoire des Mines in Paris I* is using a sophisticated technique for identifying the provenance of stones, but it is slow and expensive.

<sup>112</sup> Agriculture exacerbated the problem, as it was either high-investment and large scale, using the *charrue* over the better limons, or poor small-scale farming interspersed with scrub-lands over the damper acidic soils.





Map IX Ashlar churches shown as black dots, and rubble as circles. No category 4 churches have been included.

of ashlar and rubble.<sup>113</sup> Map IX shows where each occurs, excluding all category 4 buildings. A rubble building, coursed or random, is less expensive than one in ashlar, no matter how close the quarry, for the stone only has to be taken out of the ground, placed as it comes, and the gaps filled with mortar.

Ashlar on the other hand has to be selected, squared, the face cut back until it is even and true, and then trimmed in size to suit coursing heights and details. Everything has to be integrated so that coursing in the walling matches that in the jambs and buttresses. Further, one has to cope with the temptation to embroider by carving decorative niceties around openings and along projections and terminations. I would estimate that the cost of labor alone in ashlar could be a third more than rubble. There are three concentrations of ashlar: along the valleys south of Laon, along those of the Oise and its tributaries, and the riverine churches of the Parisis. Elsewhere there are almost no ashlar churches at all. There is also some correspondance between these three areas and the proportion of villages with churches from this period discussed in the first part of this article: 91% around Braine and 58% near Senlis, compared to 34% near Paris, 24% around Provins, and 60% in the Meaux area.

If we take the number of churches per village, and multiply the category 1-3 buildings by an appropriate factor for the higher cost of ashlar over rubble, we get very crude figures for relative expenditure. The Parisis villages would have spent six times as much as those from Meaux, while those around Senlis and Soissons spent thirteen and twenty-two times respectively. It shows that the Ile-de-France comes in a poor third, with the villages around Braine spending nearly four times as much as those around Paris.

Approximate as these figures are, the trend is clear: there is something about those areas with the best stone, and the quarries they supported, that encouraged people in the enthusiasm so essential to any prolonged building boom, and gave them the wherewithal to accomplish their dreams.

Also, there may have been something about the stone itself that appealed to people of 1200, as exposed concrete appeals to us and cast iron did to the nineteenth century, for a large proportion of later buildings built over the

<sup>113</sup> Ashlar is coursed masonry, each stone being squared and faced. Rubble may be coursed or random but consists of irregularly shaped stones, unfaced, and set in thick beds of mortar.

*grossier* do not use it, but are built of rubble and plaster instead. Perhaps they were excited by the appearance and feel of smooth firm ashlar, with its flush, fortress-like impenetrability. If so, then the *grossier* was the only available material that could have satisfied that enthusiasm.

Yet we have not explained why the best stone should be associated with such an enormous preponderance of high-quality churches, especially in the Soissonais,<sup>114</sup> and why the boundary around these churches should coincide so clearly with that between the *calcaire* heartlands and the surrounding chalk.

It is not as if this boundary has always marked the division between church building and its absence. These two entities, geology and geography, have existed since time immemorial, and the chalk lands are full of churches from other periods, both earlier and later.

In some regions, the chalk may have been less dependable, but the existence of churches in every town you pass through makes it unlikely that any properties intrinsic to the stone itself may have discouraged building. Yet the fact remains that around 1200 there is nothing anywhere in France comparable to the passion for building in the Basin.

#### Possible Answers

Though the number of prospective answers to these questions are many, four seem more hopeful, being factors that may have combined to produce the economic surplus necessary for construction. The first is a much-admired raw material. When we can map the sources of stone,<sup>115</sup> we may

<sup>114</sup> It has already been noted that only 34% of villages around Paris have churches with work from this period, compared to over 90% in the Soissonais, and that the proportion of better churches to those in category four is 1.2:1 for the Basin as a whole, but 5.2:1 around Soissons.

<sup>115</sup> There is a map of all the quarries west of Paris, medieval and modern. It is unsigned, prepared in 1930 by the Commission des Monuments Historiques for the old Départements of the Seine and Seine-et-Oise from remains and documents. Anne Blanc showed it to me. Though some of the medieval quarries may have been worked out and all traces lost and others only recently opened up, their distribution is indicative of the proportions that may have existed during the 12th century. Around Etampes there were 18, near Corbeil six, and in the whole area southwest of Paris only seven. But to the west and north of the Bois de Boulogne, which did not include even half the *grossier* of the Oise, the map showed 76. There is one quarry to every two churches in the south, while in the north there are two and a quarter — suggesting a large production in excess of local needs, which was presumably exported. See *Annuaire des pierres de construction*, Paris, 1889, 1892.

<sup>116</sup> This article is a by-product of a continuing search to find these teams, to identify them, and to chart their wanderings. See James (as in note 3).

<sup>117</sup> The major contractors can be found working as far away from their Valois-Soissonais home bases as Blois, Bonneval, Pacy, Le Mans, Amiens, St. Quentin, Mouzon, St. Michel-en-Thierace, and Troyes — distances of 150-200 kilometers. The well-known masters of the 15th century did the same — Parler, Ensingen and Stethaimer, Wynford, Yevle, etc. The details of the 12th-century contractual system and the role of the master mason are still in dispute; see J. James, *Chartres — the Masters who Built a Legend*, London, 1982, 49-50 and 68, and review by Stephen Murray in *The Art Bulletin*, March, 1981, and the ensuing correspondence, *The Art Bulletin*, March, 1982. Also L. Shēlby, "The Contractors of Chartres," *Gesta*, xx, 1981, 173-78.

<sup>118</sup> In James, 1981, the master I called "Green" seems to have been local, "Scarlet" and "Bronze" did most of their work in the triangle between

be able to assess the value of the export from each quarry and determine who gained most from it. Profits from transport may also have been a factor. The numerous gifts of offering free access to quarries suggest that the income from them was far from negligible.

A closer study of medieval mining techniques may disclose something of the relative costs of open cut, tunneling, and transport, for the scale of exploitation may have made the northern quarries so efficient that in spite of cartage costs the *grossier* could have been marketed in competition to inferior stone produced elsewhere.

Secondly, it is a little difficult to visualize how the *grossier* could have been exported across such a large region without drawing with it many of the skilled men trained in working it. I am now studying this, and maps of the jobs built by each of the contractors so far identified show decided concentrations which may indicate where they had their headquarters.<sup>116</sup> Most of those who worked beyond their locality came from the region of the *grossier*,<sup>117</sup> including eight of the nine masters at Chartres.<sup>118</sup>

Analysis may indicate whether they were attached to specific quarries, which were the larger contractors, and whether their teams were much larger than those of the small builders. This may in turn help to show whether such wide-ranging work honed their skills and expertise,<sup>119</sup> and whether one master could control a number of scattered workshops at one time while still working efficiently in his own locality. There is also the vexed question of the impact church building had on the rest of the economy.<sup>120</sup>

Soissons, Laon, and Cohan, while "Olive," "Jade," "Red," and perhaps "Cobalt" concentrated along the Marne and near Reims, and "Ruby" and "Rose" along the Oise.

<sup>119</sup> There being few Romanesque buildings in the Basin compared to Burgundy, Aquitaine, or Normandy, the building industry of 1140 would have been small, and as demand increased it may have been the contractors nearest the most-used quarries who gained skills and contacts.

<sup>120</sup> H. T. Johnson in "Cathedral Building and the Medieval Economy," *Explorations in Entrepreneurial History*, iv, 1967, 121-210, has analyzed two opinions of the impact of church building on the economy. He refers to Lopez, 1971, who maintained that resources for cathedrals were diverted from potentially more productive commercial opportunities, and that many of the largest were built by towns least able to afford them, so helping to impair their prosperity. For the opposite view, he refers to Von Simson (as in note 23) who argued that building injected a growth impulse into an otherwise almost static economy by calling on new resources and skills. Johnson argues that the cathedrals helped to popularize fairs which brought great revenues to the towns, and he stresses the importance of the pilgrimages to the vigor of the economy. Johnson, 206, concludes that "it does not seem that building activity, at least in England, was a significant part of the gross National Investment in the Middle Ages. Only a very small percentage of the adult male labour force would have been engaged in ecclesiastical building work at any one time." I do not agree with this assessment for the Basin during the decades around 1200. From the Chartrain estimates in James (as in note 28) and from a preliminary assessment of the total costs of all churches, including the more than 50% lost, the numbers engaged in church building may have been as high as 30,000. Including other types of construction, the total work force may have reached 50,000 — which could have been close to ten percent of the total active work force. For an agricultural community, this is a high proportion indeed. The discussion was continued in the 1969 issues of *Explorations in Entrepreneurial History* by B.W.E. Alford and M.Q. Smith with a rejoinder by Johnson.



Map X Towns with documented references to vineyards in the diocese of Soissons. From research by Gislain Brunel.

The income from the sale of stone and a skilled work force may to some extent explain the density of the riverine churches whose navigable waterways provided cheap transport,<sup>121</sup> but it will not explain why the densest concentration of churches to the northeast is scattered almost uniformly across a countryside without navigable rivers. For that, one suspects some third source of cash, and wine springs immediately to mind.

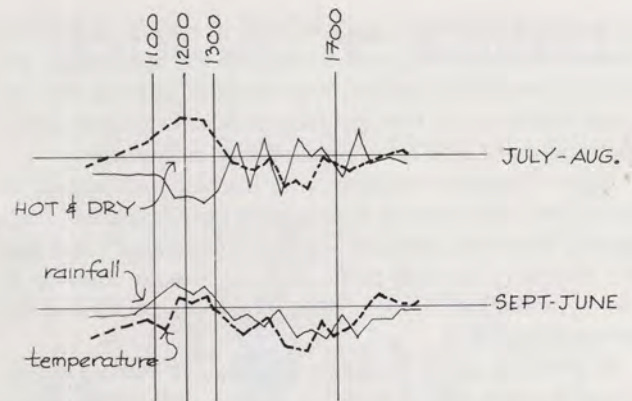
We already know that wine-making was particularly important in the valleys around Soissons and Laon,<sup>122</sup> and that being labor-intensive, it supported a large population.<sup>123</sup> But little has so far been done to quantify the export and the possible incomes from it, which may have been prodigious, as later figures suggest that the transport of wine through Paris was double the per capita production today.<sup>124</sup> Current research is showing how concentrated were the vineyards in the northern Soissonais and southern Laonnais.<sup>125</sup>

These areas grow little wine today, however, posing a fourth line of investigation, that of climate. It now seems

<sup>121</sup> They are principally along the Oise, Seine, and Aisne and in the pockets around Château-Landon and Provins.

<sup>122</sup> R. Dion, *Histoire de la vigne et du vin en France des origines au XIX<sup>e</sup> siècle*, Paris, 1959; R. Doehaerd, "Laon, capitale du vin au XII<sup>e</sup> siècle," *Annales économiques, sociétés, civilisations*, 1950, 145-165; C. Petit-Dutaillis, *Les Communes françaises. Caractères et évolution des origines au XVIII<sup>e</sup> siècle*, Paris, 1970. One of the most prosperous landowners in the area was, significantly, St.-Jean-des-Vignes.

<sup>123</sup> Dupaquier, 1969, 985, shows that wine-growing areas of the Soissonais, the Oise, and southeast of Paris had twice the population density as



Drawing 2 The changes in temperature, shown dashed, and the rainfall over the centuries during the summer months and for the rest of the year. Adapted from Lamb, 1965 (as in note 126).

firmly established that around 1200 the average summer temperature was markedly higher than today, and that a mini-ice age began near the middle of the thirteenth century.<sup>126</sup> We need to know the extent to which these changes may have reduced frost and encouraged growth in different parts of the Basin, and whether they lengthened the growing season, as suggested in some sculpture.<sup>127</sup>

While the temperature rose, there was a corresponding decline in summer precipitation, which may have suited grape production in some areas more than others. But the continuation of these factors over many decades seems to have produced a prolonged dry spell during the first half of the thirteenth century,<sup>128</sup> which may have caused the decline in agricultural production.<sup>129</sup> The decrease of church building during the 1220's and thirties suggests this may have had a considerable influence on the economy.<sup>130</sup> Further, it would be useful to know the effect of the *calcaire* substrata and its retained minerals on the quality of the wines, both under these climatic conditions and in comparison to the chalk regions.

However, wine will not be the only factor, for it does not explain the number of churches along the Essonne, around Oulchy, in the valleys of the Marne and nearby Surmelin, nor those scattered but important buildings to the south that may have had something to do with other aspects of agriculture or idiosyncrasies of patronage. Yet one cannot help feeling that in the end the most powerful factor may turn out to have been climatic.

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Wyong 2259, Australia

non-wine areas. Later figures in Fourquin, 1964, 63-70, show that the density was 25 hearths/hectare where vineyards occupied more than ten percent of the terrain, compared to ten hearths elsewhere.

<sup>124</sup> J. Favier, *Le Commerce fluvial dans la région parisienne du XV<sup>e</sup> siècle. I, Le Régistre des compagnies françaises (1449-1467)*, Paris, 1975, shows that between ten and twenty million hectolitres passed through Paris each year. This is about twice as much as is produced, drunk, and exported per capita in France today. Three quarters of all fluvial trade was wine. See H. Pirenne, "Un Grand Commerce d'exportation au moyen âge: Les Vins de France," *Annales histoire, économie et société*, 1933, 225-43. Early

14th-century exports from Bordeaux to England were only 0.7 million hectolitres; see Duby (as in note 77), 45.

<sup>125</sup> Gislain Brunel has examined all the extant documents in the Soissonais before 1200, and finds wine-growing mentioned in all the towns shown on Map X, which he has kindly allowed me to use here. He comments, "the astonishing absence of vineyards along the valley of the Marne, today planted with vines, cannot be explained by lack of documents, there being as much information for the towns of the northern half of the diocese as for the southern." However, his more recent research into the documents after 1200 is showing a notable increase in vineyards along the Marne. The best vineyards seem to have lain over the best *calcaire*, perhaps because this stone was soft enough to permit the deep-seeking roots of the vines to penetrate through the leached minerals. Also limestone reflects sunlight upwards onto the fruit, and retains heat to keep the plants warm at night.

<sup>126</sup> H. H. Lamb, "The Early Medieval Warm Epoch and Its Sequel," *Paleogeography, -climatology, -ecology*, March, 1965, 13-15; and *Climate, Present, Past and Future*, 2 vols., London, 1977; E. Le Roy Ladurie, *Histoire du climat depuis l'an mille*, Paris, 1967; M. Parry, *Climatic Change, Agriculture and Settlement*, Hamden, 1978; G. Utterstrom, "Climatic Fluctuations and Population Problems in Early Modern History," *Scientific Economic Review*, 1955, 3-47. The graphs of temperature and precipitation in Drawing 2 are adapted from Lamb. See also James, 1981, 11, 554, n. 53; P. Alexandre, "Le Climat au Moyen Âge in Belgique et dans les regions voisines," Liege, 1976.

<sup>127</sup> Contemporary Labors of the Months place sowing in Scorpio, a little earlier than today, and the corn harvest which we commence in August is shown in Chartres as occurring in July. Fourquin, 1964, 80; J. C. Webster, *The Labors of the Months in Antique and Medieval Art to the End of the Twelfth Century*, Evanston, Ill., 1938.

<sup>128</sup> In a letter Dr. Justin Schove suggests that French summers were particularly favorable to wine production after the mid-1150's. In detail he suggests this table:

1113-1125	Often poor conditions
1129-1137	Dry, often warm
1138-1145 and 1151-1156	Often wet, cold
1157-1189	Often very warm and dry

He then shows an unfavorable phase for a few years:

1192-1201	Very wet
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This is followed by a prolonged dry period lasting almost two generations, part drought-ridden, which could have affected all agriculture:

1205-1218	Very dry
1232-38	Dry except for 1233
1241-1253	Very dry
1254-1262	Wet

<sup>129</sup> See Lopez, 163, on declining yield during the 13th century; L. Duval-Arnould, "Le Vignoble de l'abbaye cistercienne de Longpont," *Le Moyen Âge*, 1968, 207-236, on decline in purchases of vineyards after 1220.

<sup>130</sup> In James, 1981, I wrote that there may have been a boom in building construction around 1180-1220. Having made this survey (as in note 3), I am still persuaded that this was the case, though I would now extend the beginning of the boom into the 1160's, with a more gradual decline during the 1220's and 1230's. R. Gem, "A Recession in English Architecture during the Early Eleventh Century and Its Effect on the Development of the Romanesque Style," *Journal of the British Archeological Association*, xxxviii, 1975, 28-49.