A STUDY OF LE CORBUSIER'S
NOTRE-DAME-DU-HAUT, RONCHAMP AS
A TWENTIETH-CENTURY PILGRIMAGE CHAPEL

by

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ABSTRACT

The completion of Notre-Dame-du-Haut, Ronchamp, by Le Corbusier in 1955 provoked much comment and conjecture as to its significance to the post-World War II era. It is a French Catholic chapel of deceptively primitive appearance built by a Swiss Calvinist architect who was often reported as an agnostic and popularly associated with visionary and industrial building schemes. Although various subjective interpretations of the chapel exist in secular and religious journals, no single account of the chapel records the complex interaction of personality, institution, history, and contemporary aims which are suggested in the chapel's forms. This prompted an investigation of Notre-Dame-du-Haut as a twentieth-century pilgrimage chapel. Consequently, this study set out to explore the relationship between French Catholicism and the architectural theory of Le Corbusier as it is expressed in this small country pilgrimage chapel.

The format of a traditional monograph was adopted to facilitate a comparison between traditional architectural solutions and those discovered at Notre-Dame-du-Haut. The study is divided into seven chapters - background, commission, plan, construction, acoustics, ornamentation, and light - elements which are shown to be especially cogent in the history of the design of this church. Each chapter is an analysis of the relationship between client and architect, and between traditional practices and twentieth-century architectural innovations. Each chapter reaches its own conclusion as to the contribution made to the pilgrimage tradition at Notre-Dame-du-Haut, and the possible significance of that contribution to the patron and to the architect.
An extensive number of Le Corbusier's published writings and journals were available from the University of British Columbia library. Among them were two books about the chapel and Les Oeuvres Completes. These supplied good visual material. Plans, letters, and documentation of the chapel previously unpublished were obtained from the Le Corbusier Foundation in Paris. Correspondence between Marcel Ferry, originally involved in the commission, and Abbe Bollé-Reddat, first and current resident priest at Notre-Dame-du-Haut, offered significant and new information. Writings by members of the French Catholic Church, including published personal journals of ecclesiastics associated with the project, were also available from the University of British Columbia library. Interlibrary loan supplied references not found locally. Journals, periodicals, and contemporary newspaper accounts, as well as general survey books on church architecture and Le Corbusier, proffered insightful background information.

In conclusion, the thesis considers the pilgrimage chapel of Notre-Dame-du-Haut in its architectural and religious contexts to see to what extent these are reflected in the chapel's design. The study suggests that Le Corbusier attempted, in a highly conscious way, to accommodate tradition and a particular section of contemporary religious thought into his design of the chapel. It also suggests that he did so without compromising his personal architectural philosophy.
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INTRODUCTION

Notre-Dame-du-Haut is an isolated country chapel that has caused much debate and interest during the last quarter of a century. It is included in every major architectural survey book of the period; indeed, it emblazons many of their covers. It has generated an enormous amount of criticism and comment, most of it favourable. This mass of critical literature, both positive and negative, serves to convince us that the importance of the chapel as an architectural accomplishment representative of the twentieth century - the century of technology, machine art, mass domestic housing, enormous secular structures, and of religious scepticism - remains an indisputable fact.

In its history, the chapel has elicited only two critiques of consequence from within the Church body itself. This criticism is centered upon its theoretical basis. Notre-Dame-du-Haut was thought particularly praiseworthy by the spokesmen of the French Catholic Church, the patrons most directly concerned with its building and those who were best acquainted with its purposes. In relation to the terms laid down by the client, the church has been judged functionally perfect. It was accepted not only by the parishioners for whom it was ostensibly built, but by official policy of Rome as well. Even before it was completed, members of the architectural community were glorifying it, and praise by the religious community soon followed. However, within a year of its completion others were beginning to damn it. It is interesting to note that while the chapel was criticized for its "functional" shortcomings by some architects, it was simultaneously praised for its "functional" superiority by members of the Church. A recent layman critic made the
curious observation that Notre-Dame-du-Haut (seen from a 1977 perspective) could be thought to be "too much of its time", hence not, to his mind, sufficiently avant-garde.

Less tangible points for discussion, such as: Notre-Dame-du-Haut's sacred character and the sense of mystery which it provokes; Notre-Dame-du-Haut as a temple of joy and optimism; Notre-Dame-du-Haut as an expression of liberation and a statement of hope, appear in both secular and religious writings. Invariably the local and historical importance of the site is emphasised. In most cases the purely formal and aesthetic aspects of the chapel are stressed. There is little questioning of the appropriateness of the structural components and of the final appearance of the chapel - despite the fact that photos of the chapel during construction and after, shown in the same article, suggest a contradiction between the two. Le Corbusier himself flaunted this apparent contradiction, to both "explain and amaze".

The issues to which the Church addresses itself most directly in the first years of the chapel's completion are those which concern the artist and the definition to be given to the term "sacred". In most, if not all of the writing of this early period, Notre-Dame-du-Haut is seen as many things: witness to the courage of those responsible for the hiring of Le Corbusier; as a brave step into new realms of architectural theory; as the revivified church; and as evidence, in the modern world, of a divine presence expressed in human creativity and genius. In commenting upon the architect, the representatives of the religious community take pains to point out the affinity between Le Corbusier's sense of morality and social responsibility and their own. Le Corbusier's sense of spirituality is also emphasised; his pronouncements of a "new
sensibility' found in Vers une architecture (1923), are often quoted, thereby implying an essential similarity between the spirituality intended by Le Corbusier and that intended in theological doctrine.  

These comments and the reaction to the building suggest that an exciting nexus between Le Corbusier and the Church exists in Notre-Dame-du-Haut perhaps comparable to that created at St. Denis by Abbot Suger or at St. Peter's by Michelangelo.
CHAPTER 1

THE CIRCUMSTANCES OF THE COMMISSION OF LE CORBUSIER'S DESIGN

Immediately following World War II, the Catholic Church in France embarked upon a path of architectural rejuvenation equal to that which it had already attempted in ecclesiastical painting and sculpture between the two World Wars.¹ The new focus on architecture resulted in part from the necessity to replace or repair bomb and fire damaged churches and in part from the need to construct new parish churches in response to changed urban patterns.² Such a building program was envisioned also as a means to re-emphasise the Church's relevancy in the modern world.³ A similar dual-purpose program had been developed successfully in Germany and Switzerland in the late 1920s and 1930s.⁴ Past achievements in ecclesiastical architecture, in which the entire Christian tradition was represented, were much written about in many Catholic periodicals beginning after World War I.⁵ Such writings presented proof of both the Church's universalism and its ability to evolve in response to changing social, historical, and ecclesiastical pressures. Forms representing the various historical styles were interpreted in terms of their contextual pertinence. In re-establishing the social, religious, and aesthetic milieux of the respective styles the relevancy of each was stressed and a solid social interpretive basis for contemporary stylistic concerns was assured. Such examples were intended as inspiration and justification for similar concerns and undertakings during the period of Notre-Dame-du-Haut's construction.

Notwithstanding the traditional and conservative tendencies which
such historical concerns could and did provoke, it also allowed a French Catholic avant-garde to emphasise the connection between style and society and to assert that a change in society should signal a change in style. This supported their claims for a contemporary style. This avant-garde, consisting of a small group of enlightened clergy and a number of Dominican priests, disseminated their ideas through publications such as L'Art Sacré, and directly encouraged unconventional architectural undertakings. In addition, many felt that clergymen should possess not only liturgical knowledge but architectural understanding as well. It was felt that an aesthetically enlightened clergy would be in the best position to oversee ecclesiastical artistic projects.

Clearly, knowledge of church ritual was not sufficient. For this purpose special commissions were established in many dioceses, an action that was acknowledged by the Pope as a necessary and beneficial procedure. One such commission, the Besançon Commission for Sacred Art, directed the proceedings by means of which Le Corbusier's design was invited and later approved for Notre-Dame-du-Haut. Moreover, important members of the Commission clearly distinguished themselves from ecclesiastics of the Right and identified themselves with an avant-garde.

The Besançon Commission for Sacred Art was composed of an artistically well-informed ecclesiastical and social élite: Archbishop Dubourg, Archbishop of Besançon (and later replacing him Archbishop Dubois), Archbishop Belot, Marcel Ferry, Canon Ledeur, who acted as secretary for the Commission, and Mr. Mathey, who was then Director of Arts and Decoration in Paris. The parishioners of Ronchamp were represented by a comité headed by Mr. Alfred Canet, an industrialist and treasurer of the Commission, and had among its members Abbé Bourdin, Curé of the
village, and a lawyer from Vesoul named Mr. Carraud. It was this committee that would vote financial approval for the chapel and endorse the necessary loans and mortgages. However, in total the Parish contributed three million francs and the project relied heavily on the war indemnity assessed by an independent architect employed by the government and the personal efforts of the Minister of Reconstruction. The war indemnity was assessed at 13.8 million francs in 1951. Although the indemnity decision did not have any direct bearing on the choice of architect or design, it did place restraints in terms of capital and the reuse of salvageable material, and bureaucratic intervention and delays created an atmosphere of uncertainty and suspicion about the project. The dependence on the indemnity also accounted for the active involvement of Claudius Petit, then Minister of Reconstruction, who sought striking secular architectural projects and renowned architects in an effort to convince the public of France's post-war recovery and to stimulate private enterprise. The Unité d'Habitation, Marseilles, which previously united the efforts of Le Corbusier and Petit, is an example of his efforts. Thus, in an indirect way, the French government and the people it represented were also patrons of the chapel.

The Besançon Commission for Sacred Art, with Canon Ledeur's leadership, had previously been active in the promotion of modern art and its use in existing ecclesiastical structures. However, until the Ronchamp Commission, its efforts had concentrated upon painting, stained glass, and sculpture, rather than architecture.

Up to the time of the Commission's work for the chapel at Ronchamp (1947-1950) church building committees had customarily employed local
This custom was followed at Notre-Dame-du-Haut and a local architect did complete a design for the site. His design was for a rectangular structure with a gabled roof, a square east end, and a central tower in the west facade surmounted by a bell-tower with a bulbous-shaped roof; a church which in shape, size, and general massing resembled the vernacular style of parish churches in the French-Swiss border area. Although no dimensions were given, it appears smaller and less complex in massing than the previous church at the site, and lacked the latter's large eastern porch. It was rejected by the parish because of its insufficient accommodation of pilgrimage needs and lack of internal flexibility. It was following the rejection of this scheme that the Commission for Sacred Art at Besançon invited Le Corbusier to propose a replacement for the World War II-ravaged church still remnant upon its strategic high place overlooking the Ballon Gap and the French-Swiss border.

The Commission first approached Le Corbusier in the spring of 1950. He refused the invitation to participate, insisting that he "did not design churches". He was also concerned that the site would not be amenable to his construction methods. However, due to the prescient vision and conviction of Canon Ledeur, Le Corbusier was ultimately secured for the project. A letter dated 6 May 1950 reveals that Canon Ledeur's persistence ensured the Church's acceptance of Le Corbusier and his concern assuaged any doubts Le Corbusier may have had about such an undertaking: Le Corbusier consequently reconsidered.

On 20 May 1950 Le Corbusier made his first visit to the site. He made many sketches of the destroyed church which record his response to the site with its ruins. The sketches reveal an interest in the
prominent siting of the former church and a sensitive concern for the recording of its most salient features. It was this response which may have subsequently worked upon his imagination. He was later alleged to have changed his mind about accepting the commission because of this trip.

An impressive gathering of dignitaries awaited Le Corbusier's participation in the rebuilding of the shrine. In addition to the Besançon Commission for Sacred Art, Claudius Petit, Mr. Jardot, Director of the Photographic Archives in Paris, Père Régamey, and Père Couturier were also involved.

In the months that followed a new series of sketches premised upon the earlier site drawings led to a full three-dimensional conceptualization. The resulting maquette was first seen by the members of the Commission in September, 1950. Prior to this official unveiling, Marcel Ferry and Abbé Bollé-Reddat, later to become resident priest at Notre-Dame-du-Haut, and Mr. Mathey had seen the maquettes at Le Corbusier's Rue de Sevres studio. By this time there were two maquettes, one of cardboard indicating its exterior aspects and one of wire rods demonstrating the structural system. In November, 1951, Archbishop Dubourg viewed the models of the proposed chapel which elicited his surprise and acknowledgement of possible controversy. He reportedly exclaimed: "Eh bien, qu'est-ce qu'ils vont dire, mes vicaires généraux". Notwithstanding his surprise, the archbishop gave authoritative sanction to the design. It was then approved by the Besançon Commission in January, 1951. However, discussion continued and actual construction was delayed. In the interim the maquette was publically displayed and debated while a number of encouraging letters passed between Le Corbusier and Canon Ledeur. Two problems
had to be dealt with: the arrangement of finances and the guarantee of complete artistic freedom for Le Corbusier. During the public discussion that followed the Besançon Commission's acceptance in January, and while correspondence passed between Canon Ledeur and Le Corbusier, some structural and minor compositional changes were made by Le Corbusier, but at no time was his conception for Notre-Dame-du-Haut seriously criticized by the parishioners. By popular vote, the finances were approved by the parish in May, 1952. Construction began in the spring of 1953.
CHAPTER II

THE PHILOSOPHICAL AND THEOLOGICAL BACKGROUND TO THE COMMISSION OF NOTRE-DAME-DU-HAUT

It is the proposal of this thesis that Notre-Dame-du-Haut at Ronchamp, far from being an anomaly resulting from a capricious and arbitrary approach to form, was actually a direct reflection of vanguard, yet well-considered, attitudes in ecclesiastical thinking and that this thinking was carefully interpreted and expressed by Le Corbusier. We can gain significant insight into the twentieth century ideas of the Roman Catholic Church from four major sources: the current "liturgical movement", official encyclicals and directives, specialized and popular literature, and prominent French priests such as Père Couturier, Père Régamey and Canon Ledeur. From these sources the philosophical circumstances of the commission for Notre-Dame-du-Haut may be ascertained and their role in the creation of the chapel suggested.

The current "liturgical movement" within the Roman Catholic Church, which began in France in the middle of the nineteenth century, was a powerful rejuvenating force within an organization which saw as its aim the active, intelligent, and fruitful participation of the people in the liturgy of the Church. The growing awareness of the richness, beauty, and communical character of liturgical prayers and texts which it prompted had diverse ramifications. It led to an emphasis on actual practice and interest in the spiritual life of the faithful and hence to pastoral and scholastic pursuits by the clergy. The movement flourished first at Solesmes, France, then at St. André-lez-Bruges,
Belgium and finally at Maria Laach, Germany and Klosterneuberg, Austria. It was first given official recognition with the directives of Pope Pius X who simplified and began partial reforms of the liturgy. Essentially, the aim was to give the liturgy relevance to contemporary sensibility, and to create sincere exterior and interior liturgical participation. The sense of community to be appreciated in the Mass was also stressed. Most important was the belief that active participation in the sacred mystery and in the solemn prayer of the Church was the first and indispensable source of the true Christian spirit.

The liturgical movement caused a number of very tangible changes. It emphasised complete consciousness of the implications of ritual and hence intellectual involvement and educational facilities. It prompted the first publication of missals in the vernacular and the simplification of rites. Numerous conferences and publications also occurred: Dom Beauduin's "Il faudroit democratiser la liturgie" (1909), Herwegen's Des Kunstprinzip der Liturgie (1920), Pope Pius X's Tra le sollecitudini (1903), and Germany's Richtlinien fur die Getaltung des Gotteshauses aus dem Geiste der romischen Liturgie (1944). In 1943 France established its Centre de Pastorale liturique. Finally, significant recognition was given to the efforts of the liturgical movement by Pope Pius XII in his Mediator Dei of 1947.

The liturgical movement supported a philosophy motivated by a liberal interpretation of Roman Catholic dogma with an emphasis on its more human, communal, and communicative aspects. Although liturgical revitalization was initiated at Solesmes, France's role was to remain marginal until after World War II at which time it became associated with Germany as the avant-garde of the movement. Furthermore, France
was then recognised for its unprecedented experimentation in various means of fostering communal participation in the liturgy, and the number of episcopates in favour of the movement. A number of these developments based upon liturgical reform had direct repercussions in church construction during the twentieth century. The first evidence of the effect of liturgical reappraisal on architecture occurred in 1913 at Maria Laach, Germany. Here church members proposing a revised liturgy met other members proposing a new approach to church design and recognized their common concerns. From that date church design had as its goal a new form that would respond to the varying and new conceptions given to the liturgy. In Germany especially, prior to World War II, new spatial arrangements having liturgical symbolic significance in plan configuration developed. Rudolf Schwartz, who codified his new space symbolism in The Church Incarnate (1938) was the major figure in this development.

In France the liturgical movement was expressed in art forms such as painting, sculpture, and decoration more directly than in architectural planning. Many in the French Church agitated for a more contemporary ecclesiastical aesthetic. Following Cingria's La Décadence de l'art sacré (1913), Maurice Denis, with Desvailliers, opened a studio of sacred art which sought to invest art with vigour and to inspire artists with a contemporary sense of brotherhood and piety comparable to that of the Middle Ages. This was supplemented by Denis' Nouvelles théories sur l'art moderne, sur l'art sacré (1914-1921) which was followed by M. Brilliant's L'Art chrétien en France du XXe Siècle (1927), Munier's Une Église Nouvelle au XXe Siècle (1932), and Père Coudurier's Art et catholéïsme (1948). All the major religious commentators
concurred that contemporary sacred art inadequately represented contemporary theological and philosophical ideals. With the exception of Munier, who documented churches rather than critiqued them, architecture was given little attention in the quest for modern, liturgically responsive art forms. Although Germany had a very directed program for finding architectural ways of expressing the new liturgical concepts, France did not. Although much post-World War I rebuilding was carried out and the officially supervised Chantiers du Cardinal built much, no directives, official statements, or experimentation with new forms appeared until 1952.

With increasing frequency one begins to see open spaces, an emphasis on a central space, the elimination of interior encumbrances, and a growing popularity in neo-Byzantine churches characteristically possessing these attributes. Also noticeable was the willingness of the French church builders to accept new materials, modern art forms, and constructional systems that began to associate modernity with the Roman Catholic Church. However, these aspects of church architecture do not appear to have been directly instigated by a conscious correlation with the new interpretation developing for the liturgy at that time. For instance, there is no reason to suggest that Notre-Dame-du-Raincy (Perret, 1923), most often cited as the twentieth century accomplishment in French Church architecture prior to World War II, was in any way designed as a conscious application of liturgical reform.

In other ways France continued to encourage the new community-conscious and liberal interpretation of the liturgy. At the same time, the mood in France allowed for regional variations and advocated respect for vernacular and national building styles. Increasingly, economic
restraints placed upon projects had contributed to a greater use of exposed concrete, a reduction of ornamentation, and less frequent use of precious and costly traditional materials. The French Roman Catholic Church rationalized this tendency by associating such economically motivated measures with the spiritual qualities of poverty, simplicity, and honesty (making virtue of necessity). Similar spiritual qualities informed the Worker Priest movement, a French experiment which sent Dominican monks to work as common factory labourers in an attempt to destroy the barriers between the clergy and the faithful.  

In 1947 Pope Pius XII issued Mediator Dei, an important encyclical of the post-World War II era. It gave official sanction to the aims and some of the results of the liturgical movement, including a number of its aesthetic ideals. Thus, in the very year that the parish of Notre-Dame-du-Haut became concerned with building a church, Pope Pius XII encouraged such undertakings with official sanctions for church building. Not only did the Pope endorse the encouragement of good art and architecture in church building, but he also approved the use of some modern styles of art.

Mediator Dei of 1947 supported a functionalist approach to space where each function found expression in the structure. A hierarchy of spatial arrangement was also recommended but by the spatial integration of well defined areas eschewing absolute separation. Certain qualities of space and building fabric were also suggested and the varieties of human responses needing architectural consideration were indicated. Meditative space as a philosophical need and therefore as an architectural consideration was given great emphasis.

Notwithstanding this rational approach, the Pope also acknowledged
the importance of the sensual aspects of religious experience, "for every impulse of the human heart expresses itself through the senses". Moreover, Pope Pius XII attributed many aspects of the liturgy to developments in the fine arts. Mediator Dei emphasised the necessary communicative and integral role which the fine arts played in the spiritual life of the faithful. Clearly, in 1947 the highest authority in the Catholic Church was interested in aesthetics, function, modernity, and the humanist tradition with regard to man's contribution to church ritual.

Many of the architectural suggestions made in Mediator Dei could be fulfilled by Le Corbusier's usual practices. The concept of functionally conceived space was part of Le Corbusier's theory of architecture. Le Corbusier also advocated a hierarchial organization of space which was integrated within a single volume rather than a series of spaces well defined with enclosing walls. The need for meditative space was of such importance to Le Corbusier that he included such areas within his domestic buildings. Although Le Corbusier emphasised intellectual involvement as central to architecture, he did not deny its sensual aspects. His consciousness of "psychophysiological" responses (kinesthetic and psychological response to stimuli) and for plasticity indicate this.

Le Corbusier was also recognized for his social concerns. Schemes for worker's houses, apartments providing daycare centres, plans for assuring communal benefit of urban and rural land, air, and greenery, and his projects for a "Radiant City" were well known in 1950. Le Corbusier's work thus coincided with a pronounced interest by church authorities and parishioners in the social role of the church as reflected in the expanded view of the parish church building as one which should include a complex of functions: meeting rooms, sports areas, daycare facilities,
classrooms, and site planning responsive to suburban contexts. Moreover, some religious literature presenting this viewpoint cited Le Corbusier for theoretical support.

The very pressing theological problem of accommodating the individual as "a stone of the church" within the larger identity of the church "edifice" was implicit in many of the comments made with regard to space in Mediator Dei. The relationship of the individual to the community was also a central philosophical and design problem expressed by Le Corbusier which can be seen as a secular counterpart to the Church's problem of assuring the laity's role in the liturgy.

No direct relationship between the directives in Mediator Dei and the philosophy of Le Corbusier can be explicitly stated. However, striking accords in general outlook suggest that a common meeting ground existed where both Le Corbusier and the Catholic Church could productively cooperate. It is likely that a realization of these concurrences were important in Le Corbusier's consideration of the commission.

Specialized and general publications also impressed upon the faithful the importance of architecture and art in fulfilling their commitments to the faith. In 1946 three special issues of L'Art Sacré focussed on the problem and merits of designing and rebuilding parish churches. In 1947 Germany published its Directives for church building which were to remain relevant as late as 1954 when they were adopted in North America by a conference held in Wisconsin. Various issues surrounding the construction of churches - social, theological, and liturgical - were increasingly prominent features in religious periodicals and were often discussed in French newspapers. The newspaper Le Monde frequently and prominently featured reports on the latest architectural undertakings of the French
Catholic Church, thus underlining the Church's endeavours as being both topical and important.  

Père Couturier, Père Régamey, and Canon Ledeur disseminated aesthetically and religiously relevant viewpoints about art which were to have consequences on Notre-Dame-du-Haut. Père Couturier was a Dominican monk who endeavoured to rejuvenate the French Roman Catholic Church by the incorporation of modern art in religious establishments. To that end he wrote three books: *Chroniques* (1946), *Art et catholicisme* (1948), *Se Garder Libre* (1962), as well as a monograph on a Montreal architect M. Perizeau (1945), and a number of articles which were published in France, the United States, and Canada. Most significant was his co-editorship of *L'Art Sacré* which began in 1937. This and other journals became convenient media through which he proclaimed his far-reaching policy of "aux grands hommes les grandes choses".

Père Couturier was personally involved in the fine arts. He began as a painter, studying at the school of Denis and Desvaillières before taking orders in 1925. He later specialized in stained glass, a pursuit which involved him in his first controversial artistic endeavour in 1938. He wrote his first and only article that was ostensibly focussed on architecture prior to Notre-Dame-du-Haut in 1938. This was concerned almost entirely with decoration. In his later writings on the controversial projects at Assy (1938-1950), Audincourt (1950-1952), and Vence (1948-1950) he did not concern himself with architecture. However, his employment of non-Roman Catholic artists, such as the agnostic Bonnard and the communists Lurçat and Léger at Audincourt, established a precedent for Le Corbusier, likewise a non-catholic, at Notre-Dame-du-Haut.
The first documented encounter between Père Couturier and Le Corbusier occurred in 1925 when both were involved in the Union des Artistes Modernes. Intermittent meetings between the two followed and were recorded in Père Couturier's diary of 1947-1954. Also, both were involved in an extraordinary church project at Sainte-Baume in 1947. Later Père Couturier was to refer to Le Corbusier's optimistic social goals which were often repeated in the pages of L'Art Sacré. During the construction of Notre-Dame-du-Haut in 1953 the priest was intimately involved with Le Corbusier in the designing of the monastery of Sainte-Marie-de-la-Tourette. At this time the priest apparently instructed Le Corbusier in much Roman Catholic philosophy. In 1953 Père Couturier wrote an article on Notre-Dame-du-Haut for L'Art Sacré that was to become the basis for much of the text of the Forces Vivres publication Le Livre de Ronchamp (1961) which was later published under the direction of Le Corbusier.

The 1953 article is the first known direct contact that Père Couturier had with the chapel. However, there was private correspondence between Le Corbusier and Père Couturier throughout the project and it was Le Corbusier's fear of unwanted publicity with its possibility of jeopardizing the commission which deterred the priest from active public participation. It is likely that in an indirect way, through his use of modern and often non-catholic artists, and directly by comments made privately to Le Corbusier, he influenced the events as they developed at Notre-Dame-du-Haut.

Père Couturier's actions and his policy of using non-catholic artists raised fundamental questions about the creative act and the nature of divine inspiration for which he was to suffer heavy criticism.
from Rome and from prominent Church figures. He also endured the censure brought against the Dominican Order for their social aims, particularly the Worker's Priest Movement.

The importance of his involvement in modern art to the commission of Notre-Dame-du-Haut is twofold. First, Père Couturier presented an acceptable precedent for the successful participation between the Church and modern artists. Secondly, he was a personality, "un brave type", with whom Le Corbusier shared many objectives - social, artistic, and personal. Indeed, the architect had received Papal disapproval with Père Couturier and the Dominicans because of his involvement at Sainte-Baume and could therefore easily identify with the much-berated Dominicans. The commission thus allowed Le Corbusier to align himself with a culturally and artistically relevant avant-garde. Charles Jencks, in *Le Corbusier: A Tragic View of Architecture*, points out that such a crusading stance was an important part of Le Corbusier's character. That Le Corbusier interpreted the Notre-Dame-du-Haut commission in such terms is evident in several letters written to others involved in the project. Therefore, the controversial and urgent proposal entailed in the commission, partly resulting from Père Couturier's past actions, may have influenced Le Corbusier's enthusiasm for the project.

The importance of Père Régamey to the commission of Notre-Dame-du-Haut is intimated in the final pages of *The Chapel at Ronchamp* (1957), a publication directed by Le Corbusier. He was among those men to whom Le Corbusier paid special tribute for the part they played in the realization of the chapel. Many referential statements to Père Régamey exist in Le Corbusier's correspondence throughout the undertaking.

Père Régamey began his involvement in the arts with his education
at L'École du Louvre in 1900. His artistic interests continued in the secular realm: from 1926 to 1928 he was the attaché to the department of painting at the Louvre, where he worked in collaboration with Paul Jamot. He became a prominent advocate of religious and aesthetic reform in 1937 when he became co-editor of *L'Art Sacré* with Père Couturier. They were former students of the same seminary. His first known combative article, *La Querrelle des Vitraux*, dated from 1937. It was a defense of the modern style of Père Couturier's stained glass additions to Notre-Dame-de-Paris in which he introduced contemporary artistic issues and answered criticisms with theological justifications and aesthetic explanations.

His stated aim for *L'Art Sacré* was to make it a strident voice against mediocrity, "kitsch", historicism, and convention. He was also critical of pious obeisance, characterizing it as sentimental, unexalted, and totally unrelated to the realities of modern sensibilities. He declared faith a poor excuse for 'bad' art and wrote disparagingly of contemporary religious artists and architects. Throughout the 1940s and 1950s he reiterated these unorthodox views in the pages of *L'Art Sacré* as well as *La Vie Intellectuelle*, *Partisan Review*, *La Croix*, and *Recherches et débats*. In addition, he gained some international reknown with articles that appeared in *Liturical Arts* and the *Journal of Arts and Letters*.

In 1945 Père Régamey was a member of the Conseil Artistique des Musées de France and from this time his efforts to bring about a renaissance in the sacred arts intensified. In 1946 three issues of *L'Art Sacré* were dedicated to the question of contemporary church architecture. This marked an important departure for Père Régamey and Père Couturier: architecture became a part of their apostolic aspirations for a renewed religious art. It was at this time that Père Régamey first included architects in
Père Couturier's proposal "aux grands homes, les grandes choses".

Père Régamey continued the application of L'Art Sacré's renovation program to architecture when he spoke before the Congress for the Reconstruction of Churches at a symposium held at Rotterdam in 1948. In the same year he supported the controversial Sainte-Baume project and thereby acquired a reputation as a radical among clerics and laity. It was also in 1948 that his prominence within the secular architectural community began.

Paul Vago, editor of L'Architecte d'Aujourd'hui, presented and enthusiastically supported Père Régamey's ideas in the October issue, 1948. In the following year Père Régamey was featured among the new patrons and thus, by inference, shared in the aim of the journal, which was "to orient one's forces to the future of an architecture deserving of modern time". "Well known among the best architects," Père Régamey was pictured as a confrère sharing in similar general aspirations for architecture expounded by Niemeyer, Sert, Giedion, Le Corbusier, and Aalto. Vago's interest served to propel Père Régamey and his endeavours for a modern church building into the consciousness of the architects who were also crusading for a modern architecture. In an article in L'Architecture d'Aujourd'hui, Vago assured his readers that church architecture had its place among the building types worthy of the modern architect's concern.

In 1952 Père Régamey published L'Art Sacré au XXe Siècle, a compendium of his previously published major themes. This is a convenient source from which Père Régamey's expectations about the actual appearance of a twentieth-century church may be extrapolated.

Père Régamey emphasised that the controversial churches at Assy, Audincourt, and Vence "just express a conviction that only the best will
do...", they are not to be understood as prototypes. Of Notre-Dame-du-Raincy he stated that it was "only one possible solution and by no means the only one, or the best". He referred to only Notre-Dame-du-Raincy; Karlskirche by Metzger; St. Michael, Dornac; All Saints, Basel, by Baur; and Notre-Dame-de-la-Trinité, Blois, by Rouvier, as really good examples of modern architecture for their time. But these were estimated as precursors of an eventual realization, not the ideal modern church itself. He also cited the prefabricated churches of Bartnig in Germany as "very successful" and indicated a preference for undecorated surfaces and unostentatious effects. More generally, he felt that the church could best present its accord with the realities (especially economic) of its situation in the contemporary world by eschewing conspicuous siting and great size. For the interior he promulgated merely an ample space with only the altar and crucifix as predominant appurtenances.

Père Regamey presented a number of architectural and aesthetic concepts which, however unorthodox they may have appeared to his religious confreres at that time, were well known to those involved with contemporary architectural theory. He advocated pure forms determined by structure, materials, and function instead of convention or historicism. He expressed his aesthetic ideals in terms such as harmony, proportion, an attendance to line and rhythm, powerful and beautiful volumes and masses, and an ingenious distribution of light and shadow. These are the same criteria used by such prominent architectural historians as H.-R. Hitchcock and P. Johnson in their discussion of modern style in architecture in their seminal work The International Style in 1932. Hitchcock continues to use these criteria. By means such as these Père Régamey called upon architecture to create atmospheres conducive to meditation...
and overpowering joy, to exalt the best in man, to be universal in appeal, to be provocative of the mysterious, and to be unifying, mystical, and theological in effect. He also advocated "logical construction" as an alternative to the illogical construction of pastiche. He felt pastiche was detrimental to the expression of a contemporary sensibility and to a spontaneous, continuous, and personal epiphany. Although he implied a rational approach to architecture and stated that art must appeal to the mind, he also called for design informed by intuitions and "not reason". Moreover, he had a penchant for describing the church with opposing images: the secluded versus the open; the church closed upon itself, offering shelter, and the church open to the world.

Père Régamey's interest in the fine arts was closely involved with his religious concerns. He believed man had lost the ability to experience a personal epiphany and to meaningfully participate in and benefit from the transcendental experience which united all men, and he understood art to be a tool by which such transcendence could be effected. Consequently he believed that the inability to perceive the exalted role of art and the inability to truly experience religious transcendence were related ills. It was to overcome these deficiencies in man's spiritual being that he sought to educate the general populace and clergy in matters pertaining to man's aesthetic wellbeing.

These would be the basic ideas and thought which one would encounter reading the articles written by Père Régamey, or working for him. While they are vague and unspecific, they do offer a number of interesting and important parameters. He advocated complete liberty for the artist based upon knowledge of aesthetic matters, the use of artists and architects outside the faith, the supremacy of genius and intuition over faith
and dogma, and a strong identification of contemporary church architecture with the aims of secular architecture and architects of the avant-garde. Most emphatically however, he expressed a discontent with the contemporary milieu of church architecture and the unresolved position as to what modern church architecture should be.

Canon Ledeur, as head of the Commission for Sacred Art at Besançon, was the person most actively involved in the choice of architect for Notre-Dame-du-Haut. He, like the theorist priest Père Couturier, also believed that aesthetic excellence should be given priority over the necessity of choosing an architect of faith. In selecting Le Corbusier, Canon Ledeur chose an architect whose works and theories were very accessible. He would have undoubtedly been aware of Le Corbusier's Sainte-Baume involvement and the Unité d'Habitation at Marseilles - each with its attendant controversies. Canon Ledeur would also have been familiar with Le Corbusier's notions about town planning in which the optimism of a society working together in harmony and joy was expressed, and which was entirely compatible with the post-World War II outlook of the Catholic Church, especially the Dominicans. Indeed, by March of 1951 Canon Ledeur was well versed in Le Corbusier's work and quoted him during public lectures held at Ronchamp. The selection of Le Corbusier, therefore, gave Canon Ledeur the opportunity for a fascinating dialogue with a major architect on the liturgical meaning of "functionalism", and augured an ideal patron-client relationship.

Canon Ledeur supported Père Couturier and Père Régamey in their aims "to bring to an end by means of a direct achievement, the absurd divorce which for the past century (had) separated the Church from living art". And in doing this, "to leave no stone unturned: to appeal
to the greatest independent artists no matter what their personal convictions". Ledeur fervently pursued these aims with seminars and exhibitions on modern art prior to Le Corbusier's involvement at Notre-Dame-du-Haut.

Ledeur also formulated a philosophical construct in which he justified his commitment to aesthetic excellence and outlined his aesthetic and spiritual ideals. The following quotations summarize some of those ideals, and elucidate his concept of the patron. For a presentation of these ideals I rely heavily on a lengthy article which, although published in 1960, is a consistent and concise restatement of those ideas found in preceding smaller articles and in private correspondence. The translations are mine.

As patron, he specified that:

For our part, let us define a program, that is to say a function, which takes into account universal liturgical rules and at the same time, of course, all local, pastoral, financial facts, etc. Even more deeply within ourselves, let us attempt to specify in what spirit we would like the work to be conceived, given the community and what we ourselves are. But then let us look for a true master of his art.

Ledeur justified his abdication of complete design control with a criticism of conventional patronage practice:

In reality the architect is often chosen for reasons, of let us say local propriety. In general he does not give any guarantees concerning church construction. But one always believes one has the option of having the plans corrected by some competent person. Certainly the function can be discussed, the plans modified. But how can one hope to improve on the forms or the volumes? That is stupid and ridiculous. Choice (of the architect) is everything.

Ledeur then stated the conditions for the choice of architect which were sincerity and full consciousness in terms of design and spiritual aspirations. He also specified:
Of course this also requires an involvement on the part of those who commission the work. The promoter must therefore know and have appreciated he whom he has chosen.94

Furthermore Ledeur indicated that these ideals were in effect at Notre-Dame-du-Haut:

Thus for Ronchamp, we were able to say to Le Corbusier, "We know very well to whom we have come. We have not come to tell you to do this thing or that thing. We have come to tell you: We need a chapel that fulfills such and such a condition. As for the rest, we know who you are. We have chosen you; try to propose something for us" You see, that suggests a real involvement on our part.95

Ledeur's definition of function in terms of program, economy, social aims, and a broad conception of liturgical rules showed him to be a man of broad vision and flexibility. These qualities allowed Le Corbusier enormous freedom to exercise his aesthetic and intellectual judgment in the tasks of design. Although Le Corbusier was informed of the concept, poetry, and theology of the Virgin by Ledeur, he was not restricted with regard to forms, structure or materials.96 Instead, Ledeur scrupulously adhered to his theory that the patron should specify functional parameters only.

Ledeur used his role as patron to safeguard the theological and liturgical requirements of Notre-Dame-du-Haut and to establish in the chapel the appropriate contemporary features of worship and sensibility.97 To accomplish the latter he was willing to forego his dictatorial prerogatives as patron in the belief that the general knowledge offered by contemporary culture, through the medium of Le Corbusier, would operate advantageously and successfully. Comments made by Ledeur indicate that Le Corbusier was encouraged to draw upon his broad cultural knowledge and to refer to the whole spectrum of religious sites in his design.98 This shows a willingness on the part of the Church to allow popular
beliefs and customs to supplement strict theological definitions as would be forthcoming from purely ecclesiastical sources.

The letters which passed between Le Corbusier and Ledeur between April 1950 and May 1955 demonstrate Ledeur's chief concerns to be that the work of Le Corbusier should not be in open conflict with the official policy of Rome and that it should not contradict commonly professed beliefs. It is not until 29 April 1951 that the canon suggested that he have any direct and specific influence on the design. It was at that date that he offered to go to Paris to discuss with Le Corbusier the important considerations to be given church furniture. Yet it is interesting to note that such furniture as exists at Notre-Dame-du-Haut shows no marked divergence from Le Corbusier's earlier furniture design.

In addition to important facts pertaining to the building fabric, the letters also reveal a striking intellectual empathy between Le Corbusier and Canon Ledeur. They shared a similar concept of style and thought of it in moral terms, of truth rather than beauty. The following distinction between truth and beauty given by Ledeur may well have been given by Le Corbusier: "...by using the term "truth" it is also possible to avoid the ambiguity of the word "beauty"." Furthermore, Ledeur centered this discussion on the work of Notre-Dame-du-Haut, using it as an example of the "truth" and implying that a similarity of vision existed between himself and the architect.

It is better to use the word truth. Moreover, in doing so we return to the language of the most demanding artists themselves.

Canon Ledeur and Le Corbusier subscribed to an interpretation of the creative act which eschewed all dogma and academic thinking. For Le Corbusier:
Plastic events do not regulate themselves according to scholarly or academic formulas, they are free and innumerable.102

Likewise, for Canon Ledeur:

Norms do not exist. Because the truth of what we have called the work of art - the truth that is created and the very act which brings it forth - does not consist in the application of a few rules.103

To replace formulas and the concept of the artist as a mere supplier of an acquired technical proficiency, both proposed the artist-creator. Thus Le Corbusier's elevated conception of the artist was supported by his patron's belief that:

The very meaning (of this creative truth) is defined in the act of creation itself. Thus it is evident it is a truth which must be rediscovered each time and cannot be easily expressed in words. It must above all be experienced.104

Le Corbusier had often emphasised the struggle involved in giving form to his inner vision and the creation of "l'espace indicible" (in-effable space).105 Thus, the very premise upon which Canon Ledeur based his definition of "truth", and hence "art", existed within the practice and often-publicised credo of Le Corbusier. Furthermore, Le Corbusier's dramatization of himself and his experiences as producing "a life which has unrolled in the brutalities of existence"106 found a response in Canon Ledeur's view of the artist as "all those who, authentically, advance themselves in a research full of uncertainty to discover their diverse possibilities. But the needs are pressing and the workers of quality are few. That is the drama of our times."107

With the commission of Notre-Dame-du-Haut, Canon Ledeur was able to have form given to his ideas. In so doing he realized the patron-architect relationship and the ideal programmatic demands which Le Corbusier had always wanted. Le Corbusier acknowledged this situation
and this freedom when he stated "it was agreeable to become absorbed in a disinterested project without any practical programme". Canon Ledeur's statements demonstrate how truly minimal the practical demands were and how unspecific their formal definition.

Le Corbusier and Canon Ledeur believed in the necessity of art and its ability to transcend the mundane; both spoke of a spiritual architecture. Le Corbusier did so in Vers une architecture in 1923 and reaffirmed it in Texts et dessins pour Ronchamp in 1955. Likewise, Canon Ledeur expressed a desire for "the sort of superior functionalism which has a certain human quality. Functionalism which includes the mysterious." Purity of "spirit", "truth", a "functionalism" that has a quality of the "mysterious", and "that which is ineffable" are among the abstract qualities that give Notre-Dame-du-Haut its present status as one of the supreme works of twentieth-century architecture. Perhaps its success is the result of the symbiotic relationship of ideals and purposes that seems to have existed between Canon Ledeur and Le Corbusier. Throughout the conception and construction of the chapel Le Corbusier was given, contrary to typical church-client procedures, an extraordinary control over artistic matters. The gift of freedom was conceived, or at least vigorously supported by the Canon as "a possible means of reconciling Le Corbusier's point of view with that of the Church's" and as an affirmation of a philosophical position. Le Corbusier was obligingly afforded assurances from the very first that he would also have complete control over all future modifications of the structure, "including access...the interior and exterior decoration, painting and sculpture, of whatever nature that might be".
Notre-Dame-du-Haut appears to be the result of a conflux of ideals. A nexus of interrelated ideas suggests that a compatible philosophical outlook towards art, spirituality, and creativity existed between the architect and patron. The similarity of Canon Ledeur's ideals with those of Père Couturier and Père Régamey commend the pervasiveness of those ideals and their reflection of a certain sector of twentieth-century French Catholic thought. Le Corbusier, as an architect, was believed by them able to give form to those ideals and thus to make Notre-Dame-du-Haut an agency through which the mind and spirit of contemporary French Catholicism could become apostolic and materially functional.

Notre-Dame-du-Haut and other ecclesiastical experiments

The rapprochement between modern architecture and the French Roman Catholic Church achieved such prominence that it prompted several major survey books recording the accomplishments. Although the date assigned the realization of the first 'modern' French Catholic Church changed as succeeding achievements made precursors of existing ones, all the major sources are agreed as to the key works. Although three stages are discernible in the literature, the second and third stages post-date Notre-Dame-du-Haut. 114

The first stage is exemplified by A. Munier's Un Project d'Église au XXe Siècle (1932) which praised technical achievements, economy, innovations in construction, and the use of new materials. 115 By discussing the church building in these terms, Munier sought to illustrate the Church's openness to modern ideas and architectural values. However, no distinction was made between such modern works as Perret's Notre-Dame-du-Raincy...
and others having obvious historical reminiscences and were clearly pastiches.

Saint-Jean-l'Évangélist (1894-1903) by de Baudot is most often cited as the first modern, and later, the first forerunner to the modern church. It was termed modern in 1903 and in 1932 because of the use of a concrete skeleton and simplified (Gothic) forms. However, in critical writing dating from after World War II, Saint-Jean came to be recognized as an early architectural reflection of the liturgical ideals of the unity desirable between clergy and laity. This appears to be a reinterpretation, influenced by current aims, of the initial impetus for Saint-Jean.

Notre-Dame-du-Raincy (1923) by Perret is unanimously heralded as the next milestone in the development of modern church architecture in France. It was labelled modern in 1930, the first modern in 1960, and the most significant precursor to the modern church in 1968. Notre-Dame-du-Raincy is a long rectangular building of exposed reinforced concrete. It has a slightly bowed apse at the east end and its entrance, with a centrally-placed clock tower above, at the west end. The interior is a single space subdivided by thin columns which support the semicircular, transverse concrete vaults of the nave and the lateral vaults of the flanking aisles. Although the nave vault is structurally and economically practical, it is also visually convenient in suggesting a traditional barrel vault. The sanctuary is raised, incorporating a sacristy beneath, and the altar is against the rear wall. Three quarters of the nave and east wall consist of great expanses of glass inserted in decorative concrete claustras which are set within the thin supporting posts which frame the structure. The lower quarter is a flat, exposed concrete wall. The nave and side aisles are therefore flooded with natural light.
emphasising the lightness of the structure and the great volume of space.

Notwithstanding its structural and material innovations, the traditional silhouette of the urban medieval church is recalled by the presence of the tower and the hall-church arrangement of the church's major volume. The presence of pattern in the glass and windows framed as claustras, crypt as sacristy, and tower as clock tower, illustrate the continuation of traditional elements within the church to accommodate new purposes rather than the creation of new spatial arrangements.

Although certain aspects of the design, particularly the predominance given to the sanctuary and the altar, the slope of the floor, and the great intensity of light, may be characterized as indicative of a modern sensitivity to emerging liturgical renovation, Notre-Dame-du-Raincy was praised for other aspects when it was built. 120 It was the structure and materials, and the clarity with which these were expressed which first gave rise to Notre-Dame-du-Raincy's acclaim by both the Church and contemporary architectural criticism. 121

There is little to indicate that the role of the patron was an influential one in determining the architectural form of Notre-Dame-du-Raincy. 122 Nor are the new planning ideas explored in Germany in the early 1920s evidenced in the plan. 123 Instead, the church appears to have derived its forms, materials, and architect from the patron's acquiescence to the economical realities of his parish; it was a rapidly expanding but poor parish needing a large but economical shelter. 124 The patron did show an open-mindedness in accepting Perret's image of a church but it is important to keep in mind that the church was accepted because of its economy, and to some degree for its embodiment of modern architectural concepts, but not especially for its modern liturgical propriety.
In neither Saint-Jean-l'Évangélist nor Nôtre-Dame-du-Raincy was architecture called upon to reflect changes in liturgical or theological thought in France by means of changes in plan configuration. However, in accepting these buildings, the Church, perhaps unintentionally, sanctioned a new image of the suburban church that possessed social and economic appropriateness rather than one that flaunted wealth.

The final stage in the development of modern church architecture in France is associated with the three churches which, in their cumulated effect, announced that a new period of church building was imminent. These were the churches of Assy, Audincourt, and Vence. In all three the ideas of Père Couturier were instrumental in the choice of artist, theme, and medium. He purposely employed non-catholic artists to illustrate his principle of "aux grands hommes les grandes choses" and thus "les maîtres en dehors". At Assy, Audincourt, and Vence he concentrated his efforts on the arts of stained glass, painting, murals, mosaic, and sculpture.

The church at Assy was commissioned in 1937 by Père Devémy, a friend of Père Couturier, and was completed before the war. It was built by Novarina and is of a standard basilican plan with a deeply recessed altar in a raised sanctuary. On the exterior it has strong reminiscences of local tradition and exemplified the trend of regionalism favoured by the Dominicans, including Père Couturier. The post-World War II work at Assy was an extension of this earlier project and most directly revealed Père Couturier's aesthetic intentions, as Père Devémy had sought his council. However, Père Couturier had consulted with Père Devémy in 1939 about the proposed church and had praised other similar works by Novarina at that time. Therefore, the church plan must have met with his approval as no changes were suggested or criticisms of it made. It is
significant that, while Père Couturier saw the need to rejuvenate church
decoration by the employ of such recognized and non-catholic artists as
Léger, Rouault, and Bonnard, he overlooked the use of comparable architects
in his apostolic aims.

The same conclusions may be drawn from Père Couturier's involvement
at Audincourt. This was to be his most concerted effort to realize his
ideals that united art and spiritual sensibility. Audincourt, built
by Novarina between 1950 and 1952, is a simplified version of his church
at Assy using the vocabulary of forms current in modern architecture. A
rectangular emphasis replaces the pronounced peaked roof found at Assy,
and thin columns replace the more numerous and massive ones. The church
at Audincourt derives its modern look from its flat surfaces, the pre­
dominance of white, the thinness of the supporting structure, the crisp­
ness of outline, and the clear differentiation and exterior expression of
the building according to the uses within. However, the plan reveals
little change from the basilica plan as understood by Perret in 1923.
As with Assy, it was the decoration and the use of non-catholic artists
which made it a controversial project.

The chapel at Vence was built in 1951. The architect was Rayssiguier,
who received some assistance from Perret. As with Assy and Audincourt,
Père Couturier was involved with the decoration of the chapel and the
artist. Although Matisse initiated his participation in the project him­
self, Père Couturier acted as his personal confidant, advising him on
theme and the intricacies of stained glass. Indeed, the architect re­
veals that his major concern was to accommodate Matisse's needs with large
unbroken areas of flat surface. Yet the chapel is planned with great
economy and ingenuity to facilitate church hierarchy and ritual in a
unified space. Different functions are housed in articulated spatial volumes freely interpenetrating and uniting at the altar. Although the harmony and proportioning of the spatial relationships were understood and appreciated by only a few, it did indicate that such architectural space could be used as a meaningful and expressive medium. At Notre-Dame-du-Haut, designed simultaneously, Le Corbusier was able to take these inchoate spatial sensitivities and make them a part of public consciousness.

The statement issued by Père Devémy and Père Couturier in defense of their program of "les maîtres en dehors" at Assy and Audincourt established the pitch of excitement and urgency which informed the post-World War II era of French Roman Catholicism. The fervency with which such issues were pursued provided a legacy for Notre-Dame-du-Haut at Ronchamp:

No more in France than in the United States need we expect that the Pope will have real competence in questions relating to modern art; for that he would have to be a specialist which he is not.136

We called on them (modern artists) purely and simply because they were the greatest .... We believed that it was our duty to procure for God and our Faith the best art of the present...

We were tired of always seeing in our churches the most mediocre examples of painting and sculpture. In the long run, we thought, that mediocrity could only result in seriously altering the religious psychology of clergy and worshippers alike.

Under the actual conditions it would be safer to turn to geniuses without faith than to believers without talent.137

Later, Père Couturier was to recognize Le Corbusier as one of those geniuses:

We believe Le Corbusier to be the greatest living architect and also one in which the spontaneous sense of the sacred is the most authentic and the strongest.138
At the time that Le Corbusier designed Notre-Dame-du-Haut at Ronchamp, the French Catholic Church was suggesting a return to tradition, in whatever way a re-evaluation of that tradition was intended. Père Régamey had defined tradition as "a constant, and beneath the infinite variety of forms . . . the most obvious constant is the perpetual renewal of the creative process". Architectural forms and customs were included in this perception of tradition and, just as the recollection of medieval architecture was intended to instill national pride and reassure the populace with past achievements, so too did the revived interest in pilgrimage seek to instill pride in personal endeavour.

Unlike the parish church, the pilgrimage church in France was not a noticeable concern of the liturgical movement in the earlier part of the century. However, it occasionally arose as a special design problem in the late nineteenth and early twentieth centuries: it appeared as a difficult design problem at Lourdes in 1864, as a design project for the École des Beaux Arts in 1899, in the enlarging of the pilgrimage chapel at Ronchamp in 1844 and again in its rebuilding in 1926, in a design competition at Nancy in 1930, and in a phenomenal project at Sainte-Baume in 1948. Indeed, the practice of pilgrimage, especially that involving shrines to the Virgin, had had a remarkable resurgence since the 1848 miracle at Lourdes. And pilgrimages to Our Lady of Lisieux, to Saintes-Maries-de-la-Mer with its attendant customs, and others continued with renewed vigour. Pilgrimage of a decidedly twentieth-century nature was
introduced into avant-garde realms of thinking with Bataille's surrealist concerns in the 1920s. The vast enlargement of pilgrimage facilities at Lourdes, Lyon, Marseilles, Montmartre, Ronchamp, and the plans for Sainte-Baume resulted from this revitalized tradition.

Although the scope of this paper precludes an attempt to trace the full history of pilgrimage churches, it is worthwhile to make some reference to the medieval pilgrimage tradition and to examine some pilgrimage churches built in France within a hundred years of Le Corbusier's Notre-Dame-du-Haut. The more contemporary churches offer insightful examples of how the pilgrimage theme was re-evaluated within its tradition during the period immediately preceding Notre-Dame-du-Haut's conception. A pilgrimage church built by Rudolf Schwartz, although in Germany and post-dating Notre-Dame-du-Haut, will offer an interesting comparison in terms of national and contemporary liturgical interpretation.

The traditional medieval pilgrimage church is characterized by two types of construction. The most well-known type is that associated with the pilgrimage to Compostela: Tours, St. Martin; Limoges, St. Martial; Conques, Ste. Foy; Toulouse, St.-Sernin; and Santiago de Compostela (Fig. 1). These churches are characterized by new spatial configurations developed to accommodate large numbers of congregated pilgrims, visible access to the sacred shrine or holy relic, devotional rituals, and chapels sheltered within a much enlarged basilica plan. Chapels for the pilgrim became more numerous and eventually evolved into the pilgrim's choir allowing the pilgrim's movement through transept and ambulatory to the shrine in the choir. Aisles were sometimes added to the nave to facilitate large crowds, as were confessionals, altars, and space. These pilgrimage churches are marked not only by their large size and complex yet ordered plans, but
also by their luxuriance, which resulted from pilgrimage gifts. Associated with these pilgrimage churches of great wealth and size are hostels and often the temporary shelters of poor pilgrims encamped upon the flanking parvis.\(^{11}\)

A second tradition of pilgrimage accommodation exists in the small shrines built as an act of individual piety or erected communally. They are often the site of miracles, apparitions, a saint's presence, or have acquired religious importance from some long-forgotten pagan or protective association. These are often situated in small and remote villages or places of difficult access.\(^{12}\) Such pilgrimage chapels have in common their small size, usual lack of ostentation, and the importance given to the site in recognition of it as a place of miracle, devotion, and act of beneficence. Examples of these are numerous and at least twelve exist in eastern France alone.\(^{13}\)

At Notre-Dame-du-Haut no single miracle marked its emergence from parish church to pilgrimage chapel. The derivation of the statue of the Virgin venerated there, and the reasons surrounding its initiation as a holy relic are unknown. Instead, a number of events including pagan precedents, Roman occupation, and continuous accessibility through periods of political turmoil, led to a fierce loyalty to the site and to the Virgin.\(^{14}\)

Although churches existed on or near the site as early as 1269\(^{15}\) and perhaps 1102,\(^ {16}\) the latter was dedicated to St. Vincent and the former predates by two years any unusual local event attributed to the Virgin of the Nativity.\(^ {17}\) And although pilgrims are recorded in 1271,\(^ {18}\) continuous occupation of the site is verifiable only from 1308, thirty-seven years later.\(^ {19}\) This, as were the others, was a parish church. In 1734, despite
the presence of the venerated statue of the Virgin (attributed to the early seventeenth century), the hilltop church was so neglected that a new, more accessible church was proposed. Subsequently, in 1741 the old church relinquished its position as the parish church and became Notre-Dame-du-Haut, to distinguish it from the new church below in the village. It retained its dedication to the Nativity of the Virgin, and the custom of the parish church to celebrate its dedication on September 8 was transformed into a pilgrimage for the entire diocese.

Notre-Dame-du-Haut's popularity grew throughout the eighteenth, nineteenth, and early twentieth centuries - primarily because of the chapel's ability to evade Republican closures and the later State Law of Separation (1906) which curtailed many religious practices. The statue of the Virgin was itself greatly enhanced by its apparent miraculous recovery from the fire of 1913 which destroyed most of the chapel. By the post-World War I era, Notre-Dame-du-Haut had become the chief center of Marian devotion of the diocese, attracting pilgrims on September 8 and at other times.

Continuing the pilgrimage church tradition in France in the modern era are: Saint-Odile, Paris (1848): the Basilica of Lourdes (1864 and 1908); Notre-Dame-du-Haut, Ronchamp (1843-1851 and 1923-1936); Sainte-Thérèsa-de-l'Enfant-Jesus, Nancy (1930); Sainte-Baume (1949); and in Germany, Santa Anna, Duren (1956).

Sainte-Odile (1848) is an urban church accommodating worship with a traditionally-placed altar in a raised sanctuary circled by an ambulatory (Fig. 2). It has three additional side chapels along one nave wall. Pilgrimage devotion is served by an easily and independently accessible underground crypt placed in the lower church. The plan of the crypt is
little determined by that of the upper church which is limited by its narrow urban site. However, the additional chapels and ambulatory are conventional to pilgrimage planning and may serve pilgrimage needs here also. Significantly, the 1940 publication documenting the church's existence does not reproduce the crypt plan nor does it extol the pilgrimage function of the chapel.

The pilgrimage to Lourdes has necessitated much construction at its site. In 1858, a comprehensive site plan was projected that included an esplanade with baths along the Cave river and the construction of a park-like setting. This design was inaugurated with the building of a basilica on the cliffs of Massabielle, which consisted of a lower church supporting a very high, narrow neo-Gothic edifice (Fig. 3). In 1883 the lower church of the Rosary, in a neo-Byzantine style, and a double ramp connecting the two churches, were begun. Pilgrimage hostels were also built. In 1908 the basilica of Notre-Dame-du-Lourdes enlarged yet again the pilgrimage services offered at the site. A combination of Romanesque and Gothic elements, conventional masonry and rubble, and a three-part elevation in the nave envelop its reinforced concrete structure. It has a traditional plan: a nave flanked by two side aisles, a projecting transept, and a polygonal apse. Although Munier documents this building as a church evincing an elegant modernization of traditional church architecture, he fails to comment upon its pilgrimage functions or its plan. However, it does provide additional sanctified space for pilgrimage devotion in close proximity to the venerated waters of Lourdes.

Notre-Dame-du-Haut at Ronchamp (1923-1936) was a pilgrimage church built as a replacement for the fifteenth-century structure - with its seventeenth-century belltower and nineteenth-century, five-towered
chapel addition — destroyed by fire in 1913 (Fig. 4). The five-towered octagonal chapel with four additional altars was part of an ambitious building program instigated by the cure of Notre-Dame-du-Haut between 1843 and 1857 in response to increased pilgrimages. In addition to an enlarged, grander church with four subsidiary chapels, an orphanage, a girls residence, and a processional way marked by monumental stations of the cross were envisioned. The building program of 1923 to 1936 produced a neo-Gothic masonry church which accommodated pilgrimage crowds with a makeshift sanctuary created in the exterior porch on the east facade. This exterior sanctuary was marked architecturally by four massive masonry piers surmounted by a gable roof which enclosed the porch. Two sweeping balustrades descended from either side of the porch to encompass the earthen plain before it. The sanctuary was demarcated further by sculptures of the Virgin and angels which adorned the roof. Published documentation of the church gives little information about the plan. However, it is the exterior arrangement which is particularly important here. Photos indicate that pilgrims congregated within the encircled plain before the porch where the altar and officiants presided. Photos also indicate that a procession preceded this (Fig. 5).

Sainte-Thérèse-de-l'Enfant-Jesus (1930) was a projected pilgrimage church for Nancy. It was the featured church in Munier's Un Projet d'Église aux XXe Siècle and was thought to realize the architectural aspirations of the French Catholic Church at that date. It resembled a conventional medieval church in its orientation and arrangement of nave, side aisles, and choir. Three entrances gave access to the narthex fronting the western extremity of the nave, and lateral entrances were situated at the meeting of transept and nave (Fig. 6). The choir was
flanked by two altars, each having a sacristy behind. Pilgrims were accommodated by six additional altars along the nave walls, two of which created a cross-nave with one of the chapels containing the relic of Sainte-Thérèse. These chapels opened directly to aisles that were continuous from the additional entrances adjacent to the major western porch, through the transept, to the ambulatory. The ambulatory encircled the major altar beneath complex parabolic vaults. Thus the traditional pilgrim's choir was retained for the "processional way of Sainte-Thérèse".

Sainte-Baume (1949) was another project for a pilgrimage church. The plan consisted of a nave hollowed from the live rock to be lit primarily by small channels cut through the rock walls (Fig. 7). The nave rose in a steady ascent to a single large area and then narrowed to a corridor eventually terminating in an exterior porch overlooking the sea. The basilica was prefaced by a long, hilly, precipitous path ascending to the cavernous entrance in the rock face that functioned as facade for the nave. Additional access to the interior space was provided by small tunnels bored through the rock which debouched at various concealed spots in the mountain terrain. The major determinants of the plan were the aim to express architecturally the ideas of pylon and grotto that were associated with the legend of Mary Magdalene, the revitalization of past customs associated with the site, and the incorporation of the actual hallowed ground in the design.

Santa Anna (1956) is a pilgrimage church built by the leading architectural representative of the liturgical movement in Germany, Rudolf Schwartz (Fig. 8). It is a church of spare cubic forms and flat surfaces ordered by rectangular geometries. Entered from a side entrance in the south wall, the interior articulation continues the geometric rhythm of
the exterior along the length of the traditionally oriented nave. Pil­grims are served by the clear separation of their activity from the more common devotional rituals focused on the major altar. They are accommo­dated in a trapezoidal space (a narthex) immediately accessible from the south entry. This narthex serves as a communal gathering area for the pilgrim where he may view the crypt or await entry to the smaller chapel which abuts the narthex and sanctuary. With reduced height and less intense illumination than the nave and sanctuary, the pilgrim's space resembles a side aisle and is manifestly subordinate to the major ceremonial areas focused on the major altar. This is perfectly in keeping with the hierarchy interpreted by those within the liturgical movement associated with Schwartz, for whom the collective events associated with the altar are of the supreme significance. The pilgrim's space, actions, and importance are accordingly less celebrated.

Few conclusions about late nineteenth and twentieth century pilgrimage church building in France can be drawn from a mere six examples. However, it will be noted that in these six a great variety of spatial configura­tions were devised to accommodate pilgrimage practice within an existing framework or concept of parish church buildings: the lower church, the simple addition of altars, the reinterpretation of a side altar or a porch. They also show much ingenuity in siting and landscaping. Only the grotto basilica of Sainte-Baume appears less dependent upon, and less derivative of, more conventional basilica plans, yet even here the earliest tradition of the catacombs is an obvious precedent. Three of these pilgrimage churches were likely informative sources for Le Corbusier. Lourdes was common knowledge in France at that time and is constantly used as a term of reference in pilgrimage discussion. Also, Lourdes was
then experiencing renewed pilgrimage interest and, within the decade, it too required a new, larger basilica. Le Corbusier read and marked pertinent sections about pilgrimage in the manual available for pilgrims to Ronchamp. As the architect-in-chief for Sainte Baume, he would have been made aware of pilgrimage practices. Indeed, a 1948 publication about the project which Le Corbusier possessed explained them. His collaboration with Trouin at Sainte-Baume resulted in his access to at least those pilgrimage practices associated with Mary Magdelene.

Le Corbusier's plan for pilgrimage ritual

Notre-Dame-du-Haut has, within its trapezoidal plan, spatial divisions intimating those of a traditional church: eastern orientation, a large central hall culminating in a sanctuary in the east end, a sacristy convenient to the altar, and vestiges of a western narthex, clerestory lighting, a south aisle, and a forecourt (Fig. 9). Lateral entrances from the north and south recall the convenient planning for monks and clergy which can be noticed in many monastery churches. The complication of the geometric configuration of the plan, with curved spaces to west and north, simply serves pilgrimage needs by providing three additional altars and several private enclosures. On the exterior, a sheltered parvis fronts the ceremonial doorway on the south and a large porch extends from the east facade. Like the nearby hostel, these amenities accommodate the pilgrim in a very practical way.

Several paths ascend the hilltop site, one from the carpark below, one from the priest's house to the west, and another from the hostel below the rim of the hill buttressing the grass parvis to the east (Fig. 10).
This plan evidences Le Corbusier's concern to design a chapel that could be walked up to, through, and around. The provision for circumambulation was not typical of recent ecclesiastical architecture and was not a discernable design feature of the six pilgrimage churches already discussed, although procession is discussed at Ronchamp and Lourdes. This is despite the fact that canon law prescribes that a zone of free space surround a church edifice when possible, and that the custom of encircling the church as part of religious processional has always been common.

Uncharacteristically for the time, he designed a hostel for visitors, although none had existed on the site previously. Le Corbusier was also careful to accommodate into his design a sheltered exterior sanctuary suitable for the ceremonials and large congregation of pilgrims on September 8, and other special festive days celebrated annually. On such days and others, the plasticity of the chapel invites approach, circumvention, and ultimate entrance through the south or north door.

Notre-Dame-du-Haut, like its pilgrimage precursors at Compostela and elsewhere, is a multi-chapelled chapel. In addition to this general tradition, the earlier church on the site with its eastern porch and ramps undoubtedly had some influence on Le Corbusier's design of the exterior sanctuary as is demonstrated by a comparison of Le Corbusier's drawings of the site showing the older church with those of the site showing his maquette (Fig. 11).

Of his own initiative Le Corbusier sought to include other less explicit and less tangible pilgrimage accoutrements and symbols. For example, there is no indication that the patron required the inclusion of three chapels, a number so important in church symbolism, or the inclusion of
such pilgrimage symbols as the shell found on the east door. Also, although the hostel and guardian's house were quite suddenly and inconveniently proposed by Curé Bourdin, Le Corbusier elaborated on the demand, including picnic tables and religious murals.\textsuperscript{53} It is likely that these accoutrements were added on the basis of Le Corbusier's own experience and analysis of the problem.\textsuperscript{54}

Notre-Dame-du-Haut is first noticed from afar as a white form perched on the high ridge above the village of Ronchamp, a small, barely modernized village 90 kilometers from the French-Swiss border and 440 kilometers from Paris, its population in 1948 being about 1,864.\textsuperscript{55} Like the religious pilgrimage monuments of the past, it dominates the landscape. One ascends the hill 131 meters to Notre-Dame-du-Haut on foot, following a rough road of red dust and loose stones.\textsuperscript{56}

Closer approach reveals a rounded white tower thrusting upward and a large expanse of white wall etched with the dark voids of windows and sweeping outward in a large concave arc to the southeast(Fig. 12). The tower and wall are parted by the brightly-painted door surface and its wall of "en brut" concrete above. A large brown-grey eave protrudes from the top of the white wall and door area and then slips behind the tower.

At this distance, about twenty yards, the path divides, offering three alternatives. One leads to the east across a broad flat plain - a countryside parvis - to where the curving white wall quickly becomes a sharp vertical urging one's progress towards the northeast. Beyond is a concave space formed by the curved east wall, the angled south spur wall, and the enlarged column in the northeast. The platform beneath is sheltered by the extended eave which soars above these supports. Within are an altar, pulpit, choir loft, bench, sacristy, and a statue of the Virgin
and Child in a prominently displayed glass niche. This is the essential
in church furniture (Fig. 13).

Alternatively, a path follows the curve of the tower wall to the west. Continuing in this direction, one first passes a fountain beneath a gar­
goyle, boldly thrusting from the dipping roofline, and then a rounded pro­
trusion which is the confessional within the west wall (Fig. 14). The
curve of the wall propels movement around the chapel toward the north until
the vertical accent of the north door is encountered (Fig. 15). The door
is inserted within two rounded white bastions and framed by the dark
lines of the expansion joints etched within them.

Further to the north, a thin metal and concrete stairway is perched
against the edifice, and the wall, perforated with the small dark voids of
windows, continues to curve and beckon (Fig. 15). The wall terminates
abruptly and the suddenness is emphasised by the continuing brown-grey
eave cantilevered beyond. Past this point the whole of the open parvis is
revealed, and from the tiered steps of the memorial pyramid the exterior
sanctuary comes fully into view (Fig. 16). In this way Notre-Dame-du-Haut's
expanding and contracting forms and interspersed punctuating details impel
the spectator in a visual way to enact a symbolic pilgrimage.

The third avenue is the middle and broadest path which leads directly
to the sheltered south parvis and the coloured door, flanked by red and
green sidelights, that beckons with its strident motifs of hands and stars.
This is the ceremonial door which allows passage directly to the nave (Fig.
17).

Passing through the ceremonial door, one enters the rear of the nave
and is held in a collecting area, or narthex (Fig. 9). After pausing and
turning right, one sees the nave extend and expand eastward (Fig. 18).
The sanctuary is easily recognized by its separation within the eastern extremity of the nave, its sanctity and traditional configuration acknowledged by the attenuated horizontal communion rail, and the slight ten centimeter elevation of the sanctuary floor with its differentiated paving. The altar is a simple rectangular slab of white stone supported on two rectangular end stones, which in turn rest upon four rectangular stones arranged in a Modular-derived pattern and placed directly on the paving. The essential cult items accompany the altar: bell, cloth, candles, portable tabernacle above, and window niche with the statue of the Virgin and the Cross behind. The Cross, Paschal candle, and statue of the Virgin are directly before the pilgrim at the south door when turned toward the altar. Thus the object sought in pilgrimage is directly and visibly accessible. The placement of the Paschal candle before the statue of the Virgin, at the meeting of the nave and sanctuary, allows orderly fulfillment of devotions. Tapers are placed nearby on a ledge afforded by the window embrasure.

During festivities one proceeds directly to this Paschal candle and offers prayers; the purpose of one's quest accomplished, one may then exit from the southeast door. This path has been guided by the pattern of light and colour along the south wall which leads first to the radiance of light from the Virgin's niche, then to the file of light coming from the brise-soleil, in the southeast corner, and finally to one's release through the constricted east doorway which leads one out of the chapel into the expansive space of the exterior church.

Alternatively, entrance through the north door confronts one directly with the expanse of joyous colour, form, and phrases written on the south windows and often projected by the sun onto the nave floor (Fig. 19).
Nearby, to the right, the two side chapels and west confessionals are easily reached (Fig. 9). An additional chapel lies directly on the left, to the east, within the north wall. Further east is the nave with standing room, pews, and the major altar. This north entrance is used mainly for everyday services, and accommodates the more common rituals of communal worship which are centered on the altar, the Eucharist, confession, and private devotions. A cross of black concrete, embedded within the paving, symbolically directs one to the altars situated at each of its three extremities (Fig. 9).

The clergy are provided with a private entrance through the three-storey sacristy and lounge within the north walls adjacent to the sanctuary and an exterior sacristy within the wall-encased column in the northeast corner. The requisite church furniture is present: elevated pulpits, choir lofts, convenient surfaces suitable for placing ritual implements, a specially-designed Paschal candle for celebrations, a portable tabernacle, and in the exterior sanctuary, a sedile for the ceremonial pomp of festive days.

The interior spatial arrangements indicate that two distinct functions have been accommodated in two integrated spaces. First there appears an inner church conveniently arranged for the common celebration of the Eucharist. The chapel of the southwest tower may also serve as a baptistery; chapel; its proximity to the narthex area of the church and to the ceremonial door suggests the traditional and functional positioning of chapels for this purpose. Each of the three chapels, because of their different sizes, allow optimal accommodation for a variety of group sizes. With its sacristy, pulpit, confessionals, and later its own resident priest, Notre-Dame-du-Haut fulfills the spatial requirements of the parish church.
It lacks only a mortuary chapel, which is provided by the church in the village.

Secondly, the spaces planned for access from entrance through nave to relic in the sanctuary and exit demonstrate the other function planned for. In addition, there is the exterior church with its own altar, pulpit, and choir loft and certain rearrangements to facilitate the intermittent large gatherings which pilgrimage attracts. The exterior sanctuary accommodates its functions much more amply and conveniently and in a more integrated manner than did the porch of the previous church. The open and expansive form of the eastern shelter offers much better visibility than that of the previous church with its massively defined and enclosed porch. Also, greater audibility is achieved by the elevated placement of the pulpit and choir loft near the upward-canted, sound-reflecting surface of the eave than would be possible in the previous porch.

A masterly interweaving of functional and poetic aims is illustrated repeatedly. One such synthesis is evidenced in the nave where the blankness of the north wall prosaically shelters private devotion and ceremonial preparation from the view of worshippers occupying the nave and poetically shields the light orchestrated on the south wall from a competing cross-light that would rob it of its intensity. Likewise, the ability of the clergy to appear from the sacristy suddenly in full ceremonial heightens the drama of their entrance. Another synthesis of function and poetry is found in the coincidence of the roof and drainage with the ancillary cistern so that the normal function of water drainage is made symbolic by the fountain-like receptacle fed by an exaggerated festive rooftop gargoyle. But perhaps the greatest interweaving of function and poetry lies in the planning of the orientation of the chapel. Not only were the practical
considerations arising from the use of natural light pursued, but so too were the symbolic considerations in the coordination of space and its use with light. (This will be developed later in the chapter on light.)

The vertical organization of space is as significant as its horizontal apportionment (Fig. 20). The two-storey sacristy and lounge are skillfully compacted within the main volume of the building and enjoy easy access to various related functions. Priest and choir can move to their intended places without interfering with each other. Vertical planning is also evidenced in the side chapel turrets where the increased height serves to diffuse the intensity of light, to differentiate the chapel from the nave in terms of light quality, to give a sense of greater extent to the small space, and to express the presence of the chapels on the exterior.

The numerous elevations and cross-sections necessary to give a comprehensive description of the planning of the chapel in vertical extent indicate the great concern for this dimension in the design of the chapel. Le Corbusier planned his four bounding walls, ceiling, and floor to better accommodate, "psychophysio logically" and symbolically, his understandings of the functions to be performed within. One example will demonstrate this.

The ceiling height dips to four meters fifty-two centimeters at the altar rail. This is significant in its connotation of earth meeting sky, of man meeting God. Likewise, the evocation of constriction, induced physically, recalls the spiritual constriction described by Rudolf Otto as accompanying the experience of the "mysterium tremendum". The contrast of this four meter fifty-two centimeter height with the expanded space, the greater amount of clear white and intense light, and the symbols of Eucharist, mediation, and redemption in the sanctuaries beyond, emphasise this
confrontation. Le Corbusier indicated in many references to the chapel that such an understanding of this spatial configuration was his intention. The interior was the place where one "was alone with oneself" and a struggle of a spiritual quality is intimated. Thus a symbolic space has surely been Le Corbusier's intention. Moreover, Abbé Bollé-Reddat readily understood and promoted this interpretation of the space. The plan of Notre-Dame-du-Haut manifests a concern with the symbolic, notwithstanding the high degree of functionality shown to exist in the design. The traditional arrangements in the inner-church configuration have both their functional and symbolic roles. So too does the sculptural treatment of the plan that prompts the enactment of a symbolic procession. The approach on foot, the hostel, the proliferation of altars, spaces, and access routes, the grotto-like aspect of the exterior sanctuary, the fissures of light, the ceremonial accents, the departure from convention in order to evoke the peculiarities of the site, and the sensitivity to popular practices and celebration are all marks of the pilgrimage tradition.
CHAPTER IV

CONSTRUCTION, MATERIALS, AND THE CREATION OF FORM

Despite the complexity of its general appearance, Notre-Dame-du-Haut is basically a reinforced concrete post-and-beam structure consisting of fourteen major supports embedded within the north (interior) wall and the south (exterior) wall, with one of the major supports visible in the exterior sanctuary (Figs. 9, 13). The roof, including ceiling and eaves, is comprised of seven flat beams running north-south supported by the fourteen posts with numerous "poutrelles", or small lateral spacing beams between. The beams vary significantly in length, depth, and shape. They cantilever beyond the supporting north (interior) wall and terminate at the enveloping north (exterior) wall. Within the sheltering span of the cantilevered beams, Le Corbusier has created the space for side chapels, lounge, and sacristies (Fig. 20). On the south, the ends of the cantilevered beams support the superstructure which forms the enormous eave of the south and west facades. It is with this simple solution that the roof is made to soar and the walls are freed to curve and lean.

The south wall is composed of five reinforced concrete, inverted V-shaped supports which vary from a thickness of 3.7 meters at the base to a width of 1.4 to 1.5 centimeters at the top (Fig. 21). These support the roof and a secondary framework consisting of angled horizontal crossbeams from which an expanded metal mesh is hung. A 4 centimeter layer of gunnite has been sprayed on the wire mesh to create the bays, deep embrasures, and splays which break up the interior wall but only minimally puncture the facade. The size, depth, and angle of each aperture is controlled in
this way. Consequently, the amount and direction of natural light flowing into and reflected from this mediating wall is regulated.

Unlike the varied concrete posts that are used in the south wall, those of the north (interior) wall are standard concrete posts of square section.\(^5\) Those embedded within the north (exterior), east, and west walls are also of standard square section. The posts in the north (exterior), east, and west walls act as reinforcement for the masonry rubble salvaged from the previous church which was used as infill. The only apertures set into these walls are in the east wall and the eastern portion of the north wall. The light which penetrates them is modified differently than the light from the south wall. The apertures in the east wall consist of small, unglazed voids left by the omission of stones in the enclosing masonry wall and a single window box framed with concrete and faced, interior and exterior, with glass panes.\(^6\) Those on the north are formed by angled concrete embrasures of various splays within the masonry rubble wall. Their voids, which differ slightly in their interior and exterior surface areas, are glazed. Conventional windows set into the masonry rubble wall allow light into the sacristy and lounge on the north.\(^7\)

The seven major beams of the roof are sandwiched between membranes of reinforced concrete 6 centimeters thick in order to create the hollow roof.\(^8\) The beams and lower membrane were poured simultaneously and became the platform to support the formwork for the upper membrane and to facilitate workmen.\(^9\) The roof was then waterproofed.\(^10\) The towers with their half-domes are also fashioned from a combination of rubble and reinforced concrete. The walls are of rubble masonry strengthened by reinforced concrete, and the domes are of reinforced concrete.\(^11\) The complexity of constructing rubble masonry vaults to create the half-domes of the side chapels was
thus eliminated by the easier technique of reinforced concrete.

On its completion in 1955 this structural system of mixed technologies and materials was questioned and the chapel was interpreted as an abandonment of the technological basis claimed for architecture prior to World War II. It was also seen as a new departure in design for Le Corbusier. Two issues arise. To what extent is the complex image presented and its constituent parts a response to imposed limitations and to what extent does it derive its complexity from a new design process and changed architectural intentions imposed by Le Corbusier.

The site offered some limitations to materials and construction. It was inaccessible to heavy transport vehicles and encumbered by the debris of an existing building. Because of stipulations made for the award of indemnities, the rubble from the existing church had to be salvaged, but the poor road and costs made it impossible to remove. Due to the impoverishment of the parish, the indemnity was crucial to the project and its stipulations, of necessity, accommodated. The rubble was later found to be of such poor quality and irregularity that original plans to leave it exposed on interior walls and paving was abandoned. Continual and unexpected reductions in budget may have caused greater restrictions on materials and experimentation with new engineering developments.

Other possible sources of limitations were conditions inherent in the construction industry in post-war France and biases within the French Roman Catholic Church. The construction industry in France was slow to recover after World War II and, although there was a strong desire to explore the possibilities of reinforced concrete in large spans and shell construction in ordinary building, and thus continue the pioneering work done in industrial building before 1920 by Freysinnet and Maillart, the lack of
support from industry and science frustrated this. Consequently, many older technologies were revived. Le Corbusier's schemes using rammed earth for emergency post-war housing is an example of this. Government projects, such as Le Corbusier's Unité d'Habitation, Marseilles, were as much an attempt to inspire the private sector of the lagging construction industry, and to present an image of reconstruction vigour, as they were an attempt to supply necessary housing accommodation. Also, the use of prefabricated structural components at Notre-Dame-du-Haut would have been economically unwise due to the small scale of the project. Lightweight steel was economically unfeasible in France at that time, although Le Corbusier was interested in employing it.

The correspondence between Canon Ledeur and Le Corbusier discloses no official limitation other than economy was imposed on materials and construction methods. Nor were stylistic prohibitions to be expected from the Besançon Commission and those influential within it. Indeed, Canon Ledeur had remarked that it was precisely on the known 'style' of the artist that he was to be chosen. Nor would exposed reinforced concrete have been without examples in French Catholic Church construction. De Baudot's Saint-Jean-l'Évangélist (1903) displayed its barren reinforced concrete frame on the interior and Perret's Notre-Dame-du-Raincy did so throughout. However, both of these, and most that followed, retained obvious reminiscences of past styles within their reinforced concrete frameworks. H.-R. Hitchcock termed such stylistic conservatism "twentieth century traditionalism" which he characterized as having obvious historical allusions presented in forms, applied decoration, and often surfacing materials: Notre-Dame-du-Raincy and Saint-Jean allude to the Gothic. "Twentieth century traditionalism" was ubiquitous in pre-World War II French ecclesiastical
building. Moreover, this conservatism had strong supporters among prominent and influential French Catholic architects immediately following World War II. Significantly, there was an active, officially supported, and numerically predominant section of the French Catholic population who opposed both reinforced concrete and non-traditional architecture. Although reinforced concrete often supplemented brick, masonry, and wood, or formed the major supporting framework, it was characteristically hidden beneath a decorative application of surfacing materials. However, stark and cubic churches openly exhibiting their use of reinforced concrete were built in Germany and Switzerland during the 1920s and continued to be built after World War II. Bartnig's churches, admired by Père Régamey, were of this type. Also, Le Corbusier had essayed a cubic church in the early 1920s. This suggests that despite the limitations of site, funding, industry, and the Church, the decision to abandon the development in austere church building that had already appropriated its images from industrial and housing design appears to have been Le Corbusier's choice.

The incorporation of materials associated with nineteenth-century technologies was not a new departure for Le Corbusier. He had used coarse masonry and exposed timber framing in the Errazuris house in 1930. Exposed brick was used for interior partition walls in his own Paris studio. Economy, available work force, and scarcity of material justified such materials in the former and elsewhere, and suggest this rationale was applied at Notre-Dame-du-Haut as well. Works of the post-World War II period showed the use of traditional materials also. Their use was not restricted to exceptional building programs, but replaced reinforced concrete in industrial buildings as well. Masonry walls displayed within exposed concrete structural members were used at the factory complex at St. Die,
and Le Corbusier designed reconstruction housing using pisé (rammed earth).\textsuperscript{38}

Equally precedent was the sophisticated handling of these materials. The Swiss Pavilion (Paris, 1932) also juxtaposed masonry with concrete,\textsuperscript{39} and the masonry walls at St. Die were precisely separated from, and contrasted with, the reinforced concrete structural members.\textsuperscript{40} The neat framing of the structural reinforced concrete one sees at Notre-Dame-du-Haut in the square, striated, concrete panels framed above the ceremonial door corresponds to this past handling of materials.

The extensive use of gunnite surfacing was attempted at Pessac and used in the houses of the 1920s.\textsuperscript{41} Garches, Savoie, and Auteuil possessed a fine gunnite surface applied to the structural concrete block used beneath.\textsuperscript{42} These surface applications served two purposes, weather protection and the creation of unified forms with homogenous surfaces. They do so again at Notre-Dame-du-Haut. Also, the white surfacing greatly increases the illumination level within the nave.

Despite the use of a material associated with the nineteenth century, the novelty of the forms, and Le Corbusier's implied definition of the chapel as a non-utilitarian structure,\textsuperscript{43} many of the constructional features mark this chapel as a modern work.

Features common to reinforced concrete construction are recognizable. Dilation joints articulated in the west wall indicate the use of concrete beneath the white gunnite surface and the shuttering pattern of the underside of the eave proclaims the poured-concrete method used. Exposed concrete frames the major entrances and announces its use at the major breaks in the enveloping masonry rubble infill wall (Fig. 12). By employing concrete in this way the entrances were easily accommodated in the design and the structural frame around them is intimated.
The use of engineers, technicians, and computers to render the roof construction feasible for Notre-Dame-du-Haut's site and for the materials and craftsmen available clearly show Le Corbusier's continued acceptance of modern methods and technology. So too does the use of gunnite and other industrial products such as the cast-iron communion rail and hand rails. Le Corbusier believed his commitment to continual technological improvement and refinement was demonstrated at Notre-Dame-du-Haut by his attempts to refine gunnite as a surfacing material and his ingenuity in constructing the hollow south wall which he felt was a needed contribution to twentieth-century architecture and an expansion of existing technologies. The glass, window mullions and transoms, enamelled door panels, and candelabrum are also factory products. However, all are especially designed by Le Corbusier and are not mass-produced ready-mades. Le Corbusier's ambivalent involvement with industry – desiring the use of industrially-produced and prefabricated products yet designing his own – is a continuation of past behaviour. Although it seems to be a denial of his own statements regarding the necessity to draw upon industry for the components of architecture, such personalized design is a legacy of the arts and crafts attitude of the late nineteenth century and of the 1920s when products expressing the required aesthetic were unavailable through mass production and were therefore unapologetically simulated.

The cantilever is another element ubiquitous in twentieth-century architecture and is fully exploited at Notre-Dame-du-Haut. On the interior, the cantilever allows the economical lateral expansion of space and, by the placement of beams, permits a vertical expansion as well (Fig. 20). The three stories of the sacristy, the single vertically expanding space of the towers, and the lower height of the northeast corner are fit within
the vertical posts that act as a spacing framework. This interlocking of spaces recalls Cubist and Purist spatial ideas and Le Corbusier's practical concerns with space "cells" as construction modules for apartment buildings. The cantilevering of roof beams frees the north exterior wall from a major supporting role and allows it to take its exterior concave shape. The wall is then able to respond formally to the projecting arcs of the side chapel domes, in addition to adding stability to the masonry rubble walls.

On the exterior, the cantilever is used to create the emphatic form of the eave, the distinctive space of the exterior sanctuary, and the south approach, and to provoke "psychophysiological" responses (kinesgetic and psychological response to stimuli). Significantly, it is the soaring roof and undulating spaces defined by the south and east walls which first attract attention. Le Corbusier has used a design element, the cantilever, not only for its structural economy and strength, but also for poetic expression.

The chapel's structure creates space and forms replete with specifics evidenced in earlier works by Le Corbusier and particular to him. The organization of a central nave-like space abutted by chapel-like spaces may be seen in the plans for the Villa Savoie, the Palace of the Soviets, and the Monul houses. The sense of asymmetry experienced externally at Notre-Dame-du-Haut, effected sculpturally through variations in height, in structural protrusions, and in the organization of light - its modelling and directive forces - was integral to Le Corbusier's design sense and is evidenced as early as 1922 in the Auteuil houses. Alternatively, the particular sense Le Corbusier had for symmetry, to be discovered in Notre-Dame-du-Haut, has its precedence in the Swiss Pavilion of 1932 and the
Additionally, two of the most arresting characteristics of the chapel at Ronchamp, the great distinction made between roof and walls, and the balancing of the roof structure on thin supports, is presaged respectively at the Palace of the Soviets and the house at Lac Leman (Lake Geneva). The curved wall has its precedence at Algiers and in the Swiss Pavilion, in interior partition and exterior fencing walls.

Post-and-beam construction, the cantilever, and gunnite and the resulting free-plan, architectural promenade, and lighting orchestrated to spatial function were important and integral to Le Corbusier's architectural evolution. The structural devices evolved from the Dom-Ino structure of 1914 and had continued use in the Auteuil, Citroen, Garches, and Savoie houses in the 1920s. In these houses Le Corbusier used the structural devices to modulate what he diagramatically demonstrated as initially a six-sided box; Notre-Dame-du-Haut continues this practice as a modulated, but skewed, box.

Thus Notre-Dame-du-Haut is neither a static reaffirmation of past solutions nor a radical revolution. The 10 centimeter light band between the ceiling and wall, with giant brise-soleils and the denial of orthogonals and right-angle corners are all means by which the "cube" is further modified aesthetically to create "rooms that have become fluid and join up and flow in a moving continuum". This is a planning, constructional, and aesthetic achievement which derived its premises, as Bruno Zevi points out, from De Stijl theory and early twentieth-century accomplishments, including those of Le Corbusier.

However, despite the many relationships to be remarked between Le Corbusier's structural means and vocabulary used at Notre-Dame-du-Haut
and his earlier work, Le Corbusier was initially reluctant to pursue the use of his reinforced concrete methods for the chapel. His comment that his "reinforced concrete methods should only be used for utilitarian structures" and his reluctance to use them at Ronchamp implies that he understood the construction of a chapel to entail considerations in addition to openly-displayed structure and materials. Le Corbusier's experiences in ecclesiastical architecture and church program are less known than his experiences in secular architecture and domestic design. Religious structures of the past such as Notre-Dame of Paris and of Chartres, the Cathedrals of Amiens and of Pisa, Hagia Sophia at Istanbul, the monastery at Mont Athos, and various temples, including primitive Egyptian, figured prominently in his sketchbooks. His book Quand les cathédrales étaient blanches posited cathedrals as the yardstick against which modern skyscrapers were to be judged. His personal library contains histories of religious buildings, including one of Ronchamp which he had profusely annotated. And in 1949 Le Corbusier expressed his sensitivity to church architecture with his response to the war-wrought ruins of the St. Die cathedral:

The burned cathedral, in ruins becomes the living torch of architecture by a deferential taking in charge of the misfortunes which have struck it. One will make of it the witness of tragic events to perpetuate through time. The roof has fallen in, and the choir and transept, cut to pieces against the sky allow through their jagged shreds of red stone a glimpse of mountains and of waving foliage of great trees. The nave is henceforth full of light, so that now we shall see clearly the beautiful Romanesque capitals which obscurity hid from our sight. Reinforced concrete, combined with clear and coloured glass offer us the chance of saving this and of handing on to the future a quivering symphony of stone and memories.

So much of this description could be applied to Le Corbusier's chapel at Ronchamp. At Notre-Dame-du-Haut the red stone of St. Die is
suggested in the red northeast chapel, the open roof in the 10 centimeter gap between ceiling and walls, the waving foliage in the painted leaves or the real trees visible through eye-level, clear glass, and a nave full of light in the light-splendoured interior. Finally, the observation of memory-evoking forms made by Le Corbusier at St. Die appears reinstated in the multi-reverential forms of Notre-Dame-du-Haut.

While the ruins at Ronchamp were not magnificent, they, and accounts of the site, were sufficient to stir Le Corbusier's imagination. This is shown in his comments expressing his reaction to the site:

In earlier times pagan temples were built there, then Christian chapels - pilgrim's chapels; and so during the centuries. Wars one after another destroyed them mercilessly because the "high point" of land on which they rested was also a landmark and an observation post. It was the last which destroyed the last chapel.

Le Corbusier's sketches of the site (dated May 1950) demonstrate not only his interest in the site's geography, but also acknowledge traditional architectural forms represented in the ruins of the former church. Vestiges of the latter appear incorporated into the new Notre-Dame-du-Haut. The intention of doing so is indicated by Le Corbusier's later juxtaposition of sketches of the ruined church with those of his completed chapel (Fig. 11). Moreover, the presentation of these sketches is often sequential, suggesting a development from the earlier to the present chapel.

Poetic allusions to the former church are discernable in the prominent south entrance, in the provision for the outdoor ceremony in the east facade, and in the irregular silhouette. The observation post distinctively shown in the first maquette is retained in the inset balcony high on the north facade of the present chapel (Figs. 15, 22). The look-out and fortress-like north facade symbolically offers a defensive front against the invasions which had so frequently plagued the site in the past.
and which Le Corbusier had commented upon. There are also descriptive passages in a published, historical account of Ronchamp owned by Le Corbusier that are comparable to certain details in Le Corbusier's design. These include the Virgin's niche, the arrangement of the sanctuary, and the references to defensive buildings once on the site.66

Forms alluding to the more distant past can also be perceived. The configuration of the exterior southeast corner is suggestive of the paleolithic elements of dolmen-like constructions (Figs. 23, 24). The domed side chapels and their resulting effects on illumination have a specific historical antecedent in Hadrian's Villa at Tivoli (Figs. 25, 26) which is recorded in Le Corbusier's early sketchbooks.67 Le Corbusier had already drawn upon Hadrian's Villa at Tivoli for the 1948 Sainte-Baume project, indicating his preference for its formal devices.68 His synthesis of these allusions to past forms in the chapel suggest a conscious attempt to represent architecturally his response to the site quoted above. Moreover, Le Corbusier's method of synthesizing historical and cultural associations into his chapel is distinctive from twentieth-century traditionalism in that the historical context is wider and less obvious, and the result far from conservative or expected in spatial and formal terms.69 The various identifications possible for the forms are capable of twentieth-century multivalent and cubist interpretation as opposed to nineteenth or even early twentieth century eclecticism with its literary associations and univalent interpretations.

In addition to the poetic and visually elusive suggestions to historical forms, allusions to contemporary forms are also evident. Le Corbusier proposed that analogies with the airplane wing and the ship's hull were applicable to the construction technique and forms used for the
He thus asserted the modernity of the chapel by the use of contemporary forms. Also, Le Corbusier added the seashell to these technically-derived forms as a suitable analogy and inspirational source for the chapel's construction. He thus extended the formal vocabulary of architecture to include his "formes poétiques". These were forms capable of creating an intellectual and emotional response in the viewer. Thus, the inclusion of the seashell in the documentation of the chapel's construction demonstrates that Le Corbusier sought forms provoking "psychophysiological" responses. This, too, is not a recent interest.

A decided interest in "psychophysiological" pursuits is evident in 1938 when Le Corbusier dismissed the importance of new materials and new methods in the creation of architectural form. He also dismissed durability and standardized building. Instead he advocated an architecture that was above any utilitarian objective. Architecture, as distinguished from building, was intended to declare an elevated purpose through its forms and their relationships.

In 1948 Le Corbusier continued his search for such declarative forms through experimentations with sculpture. His sculpture possesses many precedents for Notre-Dame-du-Haut. In his sculpture he applied colour to form to create volume; he described sculptural composition in terms of visual acoustics and he related sculpture physically to the landscape and metaphysically to poetry. These same terms of reference were applied to Notre-Dame-du-Haut. By 1948 Le Corbusier revealed a greater concern for more volumetric compositions in his painting than previously and admitted the applicability of extending formal pursuits of one medium into another.

Le Corbusier dated his increased concern for sculptable designs as originating at this time. Many of the forms, compositional patterns, and
much of the textural richness found in his sculpture are also found at Notre-Dame-du-Haut (Fig. 27). Moreover, the purpose of both architecture and sculpture was to create ineffable space which Le Corbusier equated with the experience of the miracle of faith - the consummation of plastic emotion.79

The architectural and theoretical basis for this approach to construction, materials, and form existed in Towards a new architecture where Le Corbusier stated that:

Finally, it will be a delight to talk of ARCHITECTURE after so many grain-stores, workshops, machines and skyscrapers. ARCHITECTURE is a thing of art, a phenomenon of the emotions, lying outside questions of construction and beyond them.80

(And)

Being moved, we are able to get beyond the cruder sensations; certain relationships are thus born which work upon our perceptions and put us into a state of satisfaction in which man can employ fully his gifts of memory, of analysis, of reasoning and creation. (underlining mine)81

Le Corbusier conceived of Notre-Dame-du-Haut as architecture, as opposed to building. It had an "elevated" purpose, and he was "unconstrained by any programme, other than a brief ritual which, indeed, (ennobled) the elements of the problem".82

Le Corbusier overcame the physical limitations imposed by economy and exterior restraints and explored the more poetic elements of his architectural vision. Despite the many constructional, material, and formal relationships found at Notre-Dame-du-Haut which unquestionably have precedence in Le Corbusier's architectural work, the chapel was understood upon its completion in 1955 to signal an altered position for Le Corbusier.83

The relationship to his sculpture both formally and theoretically, and his conscious search for symbolic forms, appear to be responsible for this. Although the sculptural effect is more pronounced at Notre-Dame-du-Haut
than previously, what appears to be most revolutionary is not the absence of orthogonals but the willingness - perhaps willfulness - with which the architect manipulated memory and form to create a multivalent structure which suggests universalism by the gathering together of forms connoting the wide matrix of historically and socially various symbols related to pilgrimage and spiritual drama.
CHAPTER V

ACOUSTICS

Visitors to Notre-Dame-du-Haut have praised the sound qualities of the chapel:

Ronchamp has superb acoustics and the resonance of a Cathedral space.¹

He (the Canon) stood in the back (of the nave) and sang a canticle. His voice was mellow, resonant, all-pervading. No hi-fi stereo reproduction was ever so able to give the effect of sound coming from everywhere and nowhere. In fact, after some minutes I turned around to express my appreciation, and I found that the curate had disappeared; he had moved silently into the corner chapel, and his voice from there filled the entire main space.²

The experience of sound filling the space is created by means of a long reverberation. The priest has been heard by the (visitor) singing vespers in tune with himself, the reverberation being so prolonged that the singer can even make cords with himself, using the room as a musical instrument.³

And Le Corbusier, himself, has said of Notre-Dame-du-Haut:

Its acoustic architecture in the shape of a musical instrument, will make it 'sing' among the Voges mountains...⁴

There are three important features of the acoustic environment in this chapel. The reverberation evokes the experience of a cathedral space without simulating it. It enhances the voice of the individual. And thirdly, it expresses the architect's emphasis on the analogy between space and sound.⁵ It can almost be said that Notre-Dame-du-Haut was the fruit of these explorations.⁶

Even without the references to his interest in acoustics which can be read in the Modulor, the architect's concern for this aspect of the architecture of Notre-Dame-du-Haut is visually revealed in the building:
the six curving surfaces of the chapel's four walls, floor, and ceiling; the funnel shape of the nave; the deep cavities along the south wall; the very slight banking of the pews, and the precise location of the pulpit, which juts out from a hollow close to the intersection of two major reverberant planes, a curving wall, and the curving ceiling.

Some of the impetus for acoustically-responsive architecture came from the Church. There had been a resurgence of interest in music that was given official recognition by the 1903 Tract of Pope Pius X. The liturgical movement was largely responsible for this. However, there was no contractual or written demand that Le Corbusier create a specific type of sound environment. This was left to his own discretion. But Le Corbusier's sensual and intellectual commitment was of such a degree that it is not surprising that he should have analysed the problem with great sensitivity and solved it with creative ingenuity.

The conventional accoutrements commonly installed in modern churches for sound manipulation include tapestries, carpeting, and resilient wall and ceiling surfaces to absorb sound. For purposes of sound enhancement, there were reredoes, baldachins, and soundboards designed to act as reflectors. More recently modern church building practice had introduced corrective and manipulative surfaces such as sound reflectors suspended from ceilings and loudspeaker systems.

For ordinary needs Le Corbusier used none of these. What he did do was almost unprecedented and related little to contemporary church acoustical control practices. He elected to use only the basic structure, abstaining from remedial devices such as acoustical tiles and carpeting. His approach was to manipulate the path and energy of the sound waves by controlling the shape of the surfaces from which they were reflected.
Pinpointing his sound sources at the pulpit, altars, and pews, the architect then creatively shaped all six of the surfaces of this space into a reverberant container. By further modulating these surfaces with balanced curves, strategically placed recessions such as the cavities of the south wall, and by varying the cant in the wall elevation and distances between bounding edges, Le Corbusier realized his chapel in "the shape of a musical instrument made to sing." The quotes given above attest to his success.

The outdoor sanctuary shows all the careful planning features of a bandshell. The large outward splay of the south spur wall, the angling of the outdoor sacristy in the opposite direction, and the large overhead eave that deflects expansively in a shape recalling an enlarged loudspeaker, serve to project sound outward into the crowd amassed on the adjacent plain. The placement of the church furniture - altar, pulpit, choir, loft, and sedile - maximizes this sound-enhancing setting.

The expansive shape of the outdoor sanctuary, while performing its functional duties, also manages to give visual expression to the acoustical qualities envisioned for the chapel. Le Corbusier intended sound to emanate from the chapel and to filter into the surrounding valleys.

To Le Corbusier, the practical problem of audibility was to be solved by structural considerations. The problem of sound quality was to be resolved in terms of psychological reactions. Given such considerations, he opened up a number of avenues to possible exploration into man's perception and experience of architectural space and form. He affirmed the relationship between music and form, giving greater substance to the analogy often made between music and architecture.

In addition he heightened the pilgrim's awareness of himself, his own voice, and the space enveloping him. Space so strongly (awesomely)
localized becomes place: Ronchamp, site of miracles. With the proposal that atonal music be introduced, Le Corbusier expanded the musical interests of the Church into a realm of avant-gardism not usually associated with the institution. He also suggested contemporaneity with his plans for exterior sound reflectors. These reflectors add sound reality to the visual image of the environment-engaging structure, and together they poetically and actually enlarge the presence of the chapel beyond the confines of its physical embodiment.

Le Corbusier took the traditional sound concerns of the church - music, preaching, and prayer - and made of them poetical and contemporary considerations. In so doing he synthesized a tremendously wide range of sound experiences from numerous and different places.

Le Corbusier drew upon the experience gained from his work with Auguste Perret and especially from Gustave Lyon. The theatre he designed with the latter in 1928-29 contributed theoretical and practical knowledge about acoustics. There is also evidence that Le Corbusier recalled his own past sensations of religious space in terms of its acoustical ambiance. His descriptions of religious sites found in his travel diaries of 1906 and 1911 prove him to be particularly sensitive to the role of sound in religious experience.

In Le Corbusier's ongoing quest for the relationship between the sister arts, music and architecture, Notre-Dame-du-Haut has a significant place. Prior to the chapel, Le Corbusier's concern with sound had been limited to purely practical matters in his designs and realized projects. His work on sound insulation, as found at Unité d'Habitation, Marseille, and his descriptions of the Palace of the Soviets design exemplify this. His analogies between music and architectural composition had otherwise
remained intuitive and abstract. There had not yet been a programmatic opportunity to utilize past practical knowledge of exploring theoretical incentives. Notre-Dame-du-Haut gave Le Corbusier that opportunity.

Notre-Dame-du-Haut constituted a clarification and development of Le Corbusier's ideas about the applicability of musical compositional discipline applied to architectural composition and about the perception of sound as determined by the form of acoustic environments. The importance of this can be judged by what followed. In 1958 Le Corbusier was to build the Phillip's Pavilion in Brussels, a total environment of architecture, light, pictorial image, and sound. The conception was Le Corbusier's own, as was the idea of collaborating with Edgar Varèse, appreciated among the avant-garde for his work in atonal music. He had already been approached by Le Corbusier to compose an atonal mass for Notre-Dame-du-Haut in 1954.

Notre-Dame-du-Haut may be seen as an intuitive response to Le Corbusier's own belief in the importance of all the sensory stimuli in the creation of significant architectural space and form, a belief found stated in Vers une architecture of 1923. There can be little doubt that the program presented at Notre-Dame-du-Haut was understood by Le Corbusier as a demand to create such a significant environment and that he earnestly sought to do so.

Le Corbusier's contribution was not only to aesthetics and architectural design. Long reverberation, a cathedral space, and the sound of an undaunted individual's voice were significant attributes to give a chapel built in the 1950s. The emphasis on the individual, to which descriptions of the sound environment allude, was also innovative and extremely relevant to the post-World War II Catholic Church that wished to reaffirm the importance of the individual within the Christian community. Also, on a poetic
level, the reverberant cathedral space was conducive to the harmonious blending of dissonant and disparate voices such as the Church Universal understood its earthly role to be.
CHAPTER VI

ORNAMENTATION

Notre-Dame-du-Haut is a pilgrimage chapel resplendent with ornament. Images and calligraphy revealed by coloured and clear light bespeak its dedication - a small country parish chapel sheltering a relic of the Virgin and those who seek Her.

The south windows have clearly identifiable butterflies, stars, clouds, leaves, a "moon-face" (or "Janus head"), birds, and flowers painted in bright colours of red, yellow, green, blue, violet, and black. Phrases written legibly and appropriately in the vernacular are scattered over these windows and those of the northeast wall abutting the sanctuary (Figs. 19, 28). Images, colours, or phrases are sprinkled on the tabernacle, a bell-tower louvre, the small altar crosses, and they are strewn on the floor by the action of the sun passing through the painted glass panes (Figs. 29, 28, 19). Images and colours are gathered together to create a focal point at the ceremonial door on the south facade. All these painted signs are a pattern woven into the fabric with which Le Corbusier enwrapped this sacred space.

While the Church had an acknowledged involvement with ornament such as has just been described, Le Corbusier did not. This, together with the fact that such images and literary accompaniment were not originally envisioned by Le Corbusier encourages tantalizing speculation as to his motivation in finally including them.¹

This chapter will look at the general context of ornament in twentieth-century architecture, Le Corbusier's ornament vocabulary, and contemporaneous
liturgical art. It will be the intent of such a survey to assess the possible importance of the imagery to both Le Corbusier and to the twentieth-century French Catholic Church.

Ornamentation in the twentieth century

Ornament is usually considered integral to such twentieth-century architectural aesthetics as Art Nouveau, Art Deco, and twentieth-century traditionalism. But rarely is it estimated important to the aesthetics of Le Corbusier or his contemporaries within the Modern Movement (1914-1965), such as Gropius, Oud, Rietveld, and Mies van der Rohe. I cannot hope to do justice here, but it seems important to provide a general outline.

Beginning in the nineteenth century with the writings of William Morris, Horatio Greenough, and Louis Sullivan, the question of ornament was considered within the contexts of the relationship of craft to manufacture and that of applied ornament to structural form. The social context of ornament, its morality, was here irrevocably introduced. Much late nineteenth and early twentieth-century writing casts aspersion on the use of applied ornament, and the apogee of such thinking was found in Adolf Loos' *Ornament and Crime* (1912), which condemned the use of ornament applied to structure. This denial of applied ornament was an attempt to realign the facts of industrial production with a new aesthetic vision, new building materials, and modern construction. The use of the engineer, the factory, and a Taylorized, standardized, and rationalized approach to architecture became pronounced in the opening years of the twentieth century and influenced the architect's conception of the process of construction and the relationship of ornamentation to it. The contemporary influence
of the engineer dates from the nineteenth century when beauty was discovered in the undisguised structure of cast iron and steel bridges and in the magical effects of such "engineering" feats as the Crystal Palace and the Eiffel Tower. Thus, by the early years of the twentieth century, a distinction was made between applied ornament and that which was integral to the building fabric and structure. In 1932 Philip Johnson and Henry-Russell Hitchcock, under the banner of the International Style, discussed the contemporary work of Le Corbusier, Gropius, Oud, Rietveld, and Mies van der Rohe without mentioning ornament as such. Instead, the effect of materials, surface qualities, and the disposition of solid planes and voids were considered in terms of their "ornamental effect" (visual interest, variety, meaningfulness).

With the single epithet "form follows function" the visual complexity of progressive twentieth-century architecture has often been thought adequately characterized. However, close scrutiny of these same texts show that there were discrepancies between word and deed. Many of their authors were not adverse to the use of ornament and some, including Gropius and Le Corbusier, admitted the possibility of its fully blossoming again at some future date. In addition, the pervasive and seminal influence of Ruskin at the turn of the century must not be overlooked. His perception of ornament as an analogue to the expression of nature's vitality and of God's working had repercussions on Sullivan, Antoni Gaudi, and Le Corbusier.

Writing in 1852, Ruskin stated that "the principle part of architecture is ornament", and that "the architect who is not a sculptor or a painter is nothing better than a builder". Le Corbusier's constant reference to his painting and sculpture as architectural research indicates
his continued, although slightly altered, adherence to Ruskinian thought.

A great influence in Le Corbusier's early years, Ruskin's elevated conception of ornament must remain within the context of any discussion of Le Corbusier's.

In 1935 Le Corbusier stated that "the very conception of organic architecture (i.e., his own) contributes to the arrangement of the exterior, with varied architectural expedients for the enhancing of sculpture in the outdoors". His intentions were made explicit by the expressive sculpture appended to the accompanying facade designs for the League of Nations. Clearly architecture could be embellished. However, to ensure clarity of purpose, Le Corbusier divided what was once considered architecture when appropriately ornamented into equipment, "objet d'art", and its context, architecture.

Importantly, architects of the Modern Movement (1914-1965) reacted as much to the meaninglessness of their contemporary ornament as they did to its structural redundancy. Alongside the technical, structural, and material justifications given for the development of a new approach to ornament, there also developed aesthetic vindications. Design choices were often justified in terms of proportion, psychic sensation, basic geometric form ideals, and enhanced surface qualities. Aesthetic justifications for architectural detail can be traced in the writing of Ruskin, Owen Jones, Greenough, and Sullivan in the nineteenth century, and Loos and Le Corbusier in the twentieth century. Viollet-le-Duc, Choisy, Charles Blanc, and the cubist, constructivist, and de Stijl movements were also contributors to the assessment in formal terms of architectural elements, composition, and detail. From the art movements architecture evolved basic shapes and design patterns which were either
simplified or had been purged of conventional and historic stylistic associations. Ornamental detail had been replaced by floating, clearly defined planes, pure colour (with its space-defining qualities), and the manipulation of light for programmatic demands. Loos, for example, so focussed upon the quality of materials and manufacture that he made them into concerns which are not always justified by practicality or economy and could only be termed decorative.

The question of appropriate ornamentation was therefore present throughout the twentieth century. It was decidedly important at the C.I.A.M. conferences of 1947 and 1949. Here the role of the plastic artist, including the architect, was the topic of discussion. Ornamentation was at this point believed needful of the most serious consideration by the modern architect and society. Although the term "ornament" was still evaded in conference documentation, the strict adherence to "form follows function" as it had come to be understood in the first half of the twentieth century was deemed inadequate. Le Corbusier, who was present at the conferences, was among those who expressed this belief. Subsequently, at the time of Notre-Dame-du-Haut's commission, Le Corbusier denied the purely "functional" classification normally given to him and openly questioned its priority in assessing architectural merit. This was not a revision of his earlier policy, since he had predicted in Vers une architecture of 1923 that a place for the plastic arts would be realized in twenty years. By 1947 the time had arrived.

The ornament vocabulary of Le Corbusier

The writing and work of Le Corbusier show clearly how he related to
and was a part of the twentieth-century pursuit of meaningful ornament. He justified this quest with claims validated by both practical functionalism and aesthetic ideals. He too called for the demise of applied ornament, the embracing of the machine's capabilities, mass production, and standardization. He emulated scientific analysis, Taylorism, the engineer, and scientific discipline. But at the same time, he also admitted entirely aesthetic motivations: regulating lines, the golden section, "objets d'art", "objets pures", the superiority of the Philobean solids, and the ideal of a mathematical order.

Le Corbusier's relationship to the developing thought about ornament can be briefly outlined. He shared in the same experiences as those of any turn-of-the-century craftsman while a young designer and engraver at La Chaux-de-Fonds (1900-1910). At Centiers-Fontainemeion, Switzerland, he participated in a quest for regionally relevant architectural ornament and had helped to decorate a chapel there with motifs derived from local flora. He read Ruskin, Owen Jones, and Viollet-le-Duc at this time, and later Choisy and Loos. He also spoke highly of Sullivan. Although for a short period critical of them all, he did in later writings recognize their influence on his conception of ornament and form. His excursions to Vienna and other cities of Austria and Germany in 1910, and the resultant book Étude sur le mouvement d'art decoratif en allemagne (1912) show him to be personally involved in the controversy regarding craft and the machine, in which he supported the latter. It is also from this date that a strong aversion to Art Nouveau, brought about by the excesses seen in Germany and Austria, can be noted in his writings. In 1925 Le Corbusier again wrote about the question of ornament; this was published again seven years later as L'art decoratif d'aujourd'hui. Here he
presented an evolutionary and cultural rationale of decorative art similar to that described by Loos. From this brief survey it can be ascertained that decorative aspects had long been a concern of Le Corbusier's. It also shows him interested in its social, cultural, and symbolic role, not merely its relationship to essential structure. It is also evident that Le Corbusier had a great exposure to a number of theorists who made some relationship between ornament and the higher realms of architectural endeavour and who perceived in ornament, meaningful relationships between God and nature as well as between economy in manufacture and social responsibility.

Purism was Le Corbusier's personal contribution to the 'stripped down' structure and aesthetic sensibility of his era. It was a philosophical system that influenced design which he developed with Ozenfant in 1918. It concentrated on clear forms and their interrelationships, interpenetrations, and silhouette. However, Purism also proposed the symbolic role of the image by its choice of motifs: typical objects representative of contemporary life. The adherence to natural or recognizable forms in his designs had led to much criticism of his lyricism, sentimentality, and subjectivity in the 1920s and 1930s. Such accusations of sentimentality were repeated about Notre-Dame-du-Haut.

From his justification of forms and architectural detail using aesthetic criteria, Le Corbusier shows himself the successor to a body of thought which developed concurrently with the more publicised attitudes of "form follows function". However, as has been shown, these submerged criteria resurfaced in the post-World War II era.

Raynor Banham, in his Theory and Design in the First Machine Age, concludes that "aesthetics as much if not more than technological
awareness determined the visual appearance of the major masterpieces of the first half of the twentieth century". William Jordy also upsets the conventional definition of modern architecture as being functionalist and preoccupied with the machine. Instead, he sees that the modern movement was propelled by a search for appropriate symbols which would enable an edifice to function as a product of its time, spiritually and physically. Given the symbolic importance which ornament and form may have, as suggested by Jordy, Le Corbusier's past involvements with it, and by the precedents set for such a view by Ruskin and Purism, such ornament as is evidenced at Notre-Dame-du-Haut suggests that its exploration may provide a new viewpoint on the work of Le Corbusier.

At the time of his commission for Notre-Dame-du-Haut, Le Corbusier's self-advertised use of 'modern' forms, striking material juxtapositions, bold sitings, and light orientations were prevalent. His use of paintings, murals, and sculpture as appropriate adjuncts to his architecture was well known. His outspokenness for a synthesis of the arts had been stated as recently as the C.I.A.M. conference of 1949. His willingness to pursue these architectural endeavours within the context of religious architecture could have been predicted by his design for Sainte-Baume.

Also, Le Corbusier's work prior to Notre-Dame-du-Haut did not lack a concern for the symbolic and its role of embellishment, as was seen in the universal symbols sought in Purism. Importantly, the Church specifically opened itself to universal symbolism after the fragmentation of World War II. In the past Le Corbusier had spoken of a universal visual language capable of expressing philosophical concepts. It was in his architecture, its forms, and his manner of ornamenting it that Le
Corbusier sought to reify his philosophical and aesthetic theorizing.

The ornamentation of Notre-Dame-du-Haut

A striking design program at Notre-Dame-du-Haut is evidenced in the geometric forms either cut into or projecting from the building fabric. On the south facade, flanking the ceremonial door, a geometric form projects from the curved wall of the southwest tower. Another rises vertically from the ground on the opposite side of the entrance (Fig. 12). While the former has no apparent structural purpose, it was intended as a support for a future sculpture. The latter bears the dedication plaque and has buried within it the documents recording the history of the chapel. While the permanently displayed dedication stone recalls an ancient tradition it is not requisite according to canon law and is not frequently found in contemporary church architecture. However, portal sculpture is common to Gothic cathedrals as exemplified by Chartres, Notre-Dame-de-Paris or the Romanesque Vézelay, all of which were known by Le Corbusier. In addition, sculpture was a frequent and characteristic device of pilgrimage activity and sculpture marking the pilgrimage routes is one of the identifying characteristics of the medieval tradition. Surpassing functional necessity, the geometric forms 'function' in their own right as sculpture. The projecting horizontal cube responds to the vertical upright cube: they 'activate' the space, giving access to the ceremonial door, and they give human scale to the large expanse of the southwest tower. In their role as place markers, signposts, and space humanizers these forms do fulfill some purposes similar to traditional portal sculptures. (Figs. 30,31).

Another rationale is suggested by the use of geometric forms. The
stone block which serves as a dedication stone is of his 'Modulor' proportions, 113 x 113 x 70 centimeters, and has a rectangle of 'Modulor' proportions carved out of its surface. Thus in their general proportion and geometry these ornamental devices introduce the Modulor and the philosophy that such a reference encompasses. This visual statement suggests that a continual reference to proportion be made thereafter, for to Le Corbusier "it is the Modulor which is the essence of the design - the true basis. Symbolically the entire structure rests upon it". The forms placed within the fountain flanking the west wall are also of Modulor-derived proportion. Additional forms used sculpturally, with intimations of modulor proportioning, are found dispersed about the chapel. They are discreetly carved within the south spur wall on the east facade and are found as hollows and ledges within the chapel. Modulor dimensions also determine the fenestration pattern on the south and north walls and the paving pattern on the floor.

Le Corbusier also uses a sculptural approach to create the equipment for the chapel. Pulpit, choir loft, fonts, confessionals, candelabra, pews, altars, and tabernacle are incorporated into the building fabric or designed as free-standing objects. Le Corbusier shows a fine sensitivity to materials in his choice of rich African wood for the sculptor Savina, whose aid he enlisted for the crafting of the pews. Sensitivity, as well as practicality, is also shown in the use of water-resistant Burgogne stone for the geometrically precise forms of the altars, in the bronze used for the shaped handles, and in the use of concrete and cast iron for the communion rail and hand rails. These are the objects designed by Le Corbusier and he uses the materials with which he is most knowledgeable.

Repetition of form and silhouette is used to give the ornamental
qualities of variety and interest. The most obvious example is the 'family of forms'\(^{54}\) composing the three towers. The cast iron communion rail, in profile and silhouette, coheres both with other railings found on the various stairways and with the contour of the pews. Appropriately, the communion rail is slightly larger and more elegant due to its slight curve than the stair rails and is more monumental due to its placement and isolated position on four slender posts.

The pews, fonts, curved choir loft, and communion rail offer a visual counterpoint to the rectilinear forms of the pulpit, altars, and stairways. The latter also counterpoise or respond to the major curves of the building. In addition, refinement gives precision to the forms and to the function each must perform. The fold of the communion rail makes a convenient nook for praying hands and the hourglass shape and recessed placement of the bronze handles make them easy to grip. The wooden horizontal members of the pews are moulded to the human form.

Texture is consciously used to give both relatedness to the parts and distinctiveness to the elements. The contrast of the roof with the wall (striated concrete against a nubby gunnite surface) is one example. Similar contrasts of concrete surfacing surround the ceremonial door. The repetition of the rough concrete surface on the fountain forms and the nearby gargoyle serves to visually unite the fountain with the chapel. Texture serves to integrate the choir loft with its supporting wall, while it contrasts the striated cube of the pulpit with the nubby surface of the adjacent curved wall.

Form is vigorously articulated to give aesthetic expression to structure and function. The bulge in the west exterior wall declares the presence of confessionals within. The louvered and fenestrated towers
proclaim independent alcoves beneath. The north staircase declares its function and structural independence from the wall. Expansion joints reveal underlying structural and material changes. In this way the intervening west wall between north and southwestern towers is established as an independent wrapped form (Fig. 14).

Curves of changing direction are made to meet at sharp points. This is a Modern Movement detail which distinguishes silhouette and composition from such precedents as Art Nouveau (Fig. 23). The meeting of choir loft with wall, the groove separating ceiling from wall, the deep recession of doors, and the recession of the south windows within the wall also show a concern for clearly defined architectural elements. With such sharp definition of surface and detail the overall sense of precision and rational control is created. Each of these details is also a programmatic necessity: the fountain functions as cistern, the sloping roof drains rainwater, the geometric projections and depressions are not merely abstract references to cubist composition but function as shelves for liturgical implements or devotional offerings.

Colour is also used to ornament the edifice. In addition to the white gunnite exterior, the white plaster interior, and the brown-grey stain of the roof, the wall of the northeast chapel is painted red and the northeast corner is painted purple and yellow. Apart from the possible religious interpretation of these colours (which will be discussed later) they also have an aesthetic explanation. For example, the red may serve to 'activate' the tiny space of the side chapel and the purple and yellow of the northeast corner may serve to reassert a potentially lost wall plane and to heighten the perception of brightness coming through the yellow-rimmed windows. The window images and their method of application
serve as colour accents scattering red, yellow, blue, violet, and green-light-created shapes within the nave. Colour reinforces the different depths of the window placements and acts as a screen partially obscuring vision into the nave while retaining views to the outside.

Light reflected from the painted surfaces of the niche in the east wall onto the statue within serves to enliven the venerated relic. The hint of yellow, green, and red within the niche unites the niche colouristically with the north and south windows and softens the contours of the relic. This adjacently applied colour serves to encase the statue of the Virgin in a suffused and warm glow which otherwise would have been neutral, cold, or of a substance-negating brightness.

Le Corbusier used colour previously for ornamental effect, as an aesthetic tool creating cohesion throughout, and to articulate space and form. The role of colour in creating "psychophysiological" responses had justified its use in the past for Le Corbusier and does so again at Notre-Dame-du-Haut. Drawing upon his studies of the relationship between colour and human response, Le Corbusier expresses the place of pilgrimage as a place of physical awareness and as a place of joy. For the patron this was an understanding and a function deemed important and integral to the building program itself. The repetition of form, the juxtaposition of various textures, the precise articulation of form and detail, and the judicious use of colour and its manner of application were all methods used by Le Corbusier in his previous work to create ornamental effect. It is largely because of details of colour, form, articulation and texture that the chapel is recognized as a twentieth-century edifice. In addition, many decorative details also identify the building as an ecclesiastical one.
Liturgical art

Liturgical art is art which is either an integral part of the sacred liturgy (poetry, music), immediately connected with liturgy (altar), or remotely connected with it (images of veneration, wall paintings, and statues). As is demonstrated above, Le Corbusier's scheme of ornamentation responded to the whole range of these needs. He shaped his spaces and designed a sound-enhancing bell tower and elevated galleries for music and oration. He called forth his skills as a form-giver to create church furniture such as the altar and pews, and he used his skills as an image-maker to create those images of veneration which are wanted in a Catholic church.

Twelve canon laws existed which safeguarded the importance, definition, and use of liturgical art — in buildings and furnishings and their ornamental considerations. Of these only three were of consequence at Notre-Dame-du-Haut. For the most part, the laws concerning liturgical art were merely general guidelines making little reference to specific application. Also, the period of Notre-Dame-du-Haut's construction was one of uncertainty over the issues surrounding sacred and liturgical art, a situation then recognized by the French Church. Despite the ferment, it was recommended that the local curé, a member of a Sacred Art Commission, or the Archbishop himself, guide the architect or artist in his task. Many reknowned avant-garde artists had already assisted the Church in its endeavours to create a contemporary ornament and, as has been noted, Mediator Dei recognized the importance of modern art in serving liturgical needs.

Obviously, Archbishop Dubourg's, and later Archbishop Dubois's,
acceptance of the chapel for consecration acknowledged the fulfillment of canon law. In addition, the advice of leading church figures that a dialogue between artist and church representatives be conducted was followed, and Le Corbusier did receive guidance. Canon Ledeur had instructed Le Corbusier in "the Mystery of the Church and of the Virgin Mary". This took the form of a "long and patient conversation" and was not intended as a request. Thus Le Corbusier was given responsibility for finding appropriate and original ways to handle the matter - for the French Church was not adverse to originality in style or motifs.

The chapel is spangled with symbols easily identified as references to the Virgin Mary. There are also certain textual references commonly used in litanies to Her.

On the painted windows Le Corbusier painted symbols which refer to the place of the Virgin within theology and her role as mediator between Christ and man. In the popular litanies Mary is "the cloud which brought to earth the rain", "the cloud which enclosed the sun", and "the beneficent rain cloud". She is also "the moon" and "the star who announces the advent of great light". She is seen in relation to her divine offspring as "smaller and weaker that the Sun". Clouds, stars, a moon, and darkened skies painted on the windows refer to these litanies. The chapel celebrates her as "Maria Stella", "Stella Maria", and "Star of the Sea". The latter is implied by the words "la mer" written on one of the south wall windows and thereby remind the viewer that Mary is the sailor's or traveller's guide. The statue of the Virgin, the venerated relic of the chapel, enshrined in its glass niche and placed so as to glow, is the "jewel" of the chapel. Such metaphors are found in the history of the churches built at Ronchamp that Le Corbusier is known to have read.
A few traditional symbols allude to Christ's presence. They are his image inscribed on the altar crosses and carved within the major cross in the sanctuary, the cross inscribed in the pavement, and the chi-rho and the fish painted on the tabernacle cross. The concentration of symbolic references to Christ about the altar demonstrates that Le Corbusier was concerned to correctly present liturgical and theological doctrine. His later comments and adjustments within the sanctuary show he was sensitive to the theological questions then being proposed regarding the relationship between Mary and Christ. Moreover, he had sought clarification of this from Canon Ferry. The presence of these symbolic references to Christ are entirely appropriate because, although the chapel is dedicated to the Nativity of the Virgin, it also celebrates Corpus Christi as one of its few yearly pilgrimages.

The denials made by Le Corbusier and his patrons of traditional associations to the windows could be understood as an attempt to reaffirm the modernity of the chapel and were directed at disassociating the technique involved with that of the Middle Ages. Although stained glass was undergoing a revival at that time, and was vigorously supported and made by Père Couturier, Le Corbusier chose not to employ it. Thus, he was able to remain consistent with his earlier definition of the window that included the ability to commune with nature visually as well as philosophically. It was also consistent with Le Corbusier's post-World War II aesthetic aims which included the use of coloured panes of glass. At Notre-Dame-du-Haut Le Corbusier devised painted images and a technique of application that allowed a fusion of his personal tradition of using images and architectural elements with those of the Church. Although he eschewed the medieval tradition of stained glass, he did not ignore it;
a sketch by him reveals that he used a traditional Rose window as a starting point for his own window designs. In this way, he sought to redefine this old tradition in terms of his own understanding of colour, light, and image. Thus Le Corbusier directed Père Couturier's interest in stained glass into wider and more flexible religious expressions.

It is likely that Le Corbusier also used colour in a liturgically symbolic fashion in certain places at Notre-Dame-du-Haut. The red which appears in the northeast chapel, in Church symbolism, may suggest the blood of martyrdom or the joy of celebration. As the colour of rosy dawn, it may refer to Mary as "the Virgin of the Morning Star". The northeast chapel receives the morning light and contains the phrase "étoile du matin" written on its louvre implying its use as a traditional Lady's chapel, a place of supplication. Since to Le Corbusier the colour red denoted intense activity, his choice coincides with all of these religious interpretations. Violet and yellow found on the north sanctuary wall may allude to "Regal purple and gold". These colours, associated with majesty and pagentry, are appropriate symbols for this area from which clergy and choir members emerge in official and festive dress.

The metaphors, analogies, and similies used at Notre-Dame-du-Haut were not merely a part of a long past tradition, they were also a part of contemporary poetry, literature, and painting. Nor were these literary and visual analogies foreign to avant-garde religious uses: at least two of Le Corbusier's contemporaries employed them. Such poetic terms can be found in the writings of Paul Claudel and such visual metaphors were then being employed by Léger at Assy and Audincourt. The themes introduced were also significant to the era. The devotional cults to the Virgin and Mariology were then extremely popular, especially so in
France. The miracles at Lourdes and Fatima occurred within this time period and the Bodily Assumption of the Virgin was officially recognized in 1950.

**Notre-Dame-du-Haut**, with its dedication to the Virgin and its prominently-displayed references to Her, was therefore a representation of a very significant contemporary religious sensibility. And at least one other architect, Antoni Gaudi, who was well-known for his piety and liturgical understanding, had used images culled from tradition and from nature to best give expression to his unquestionably sincere faith. And just as he had infused within his motifs not only references to theology but to architectural philosophy, so too did Le Corbusier.

Significant examples of Le Corbusier's iconography exist within the chapel. They include the motifs found on the ceremonial door, the tabernacle, and the building forms themselves.

Early versions of the design for the ceremonial door reveal that the basic format and placement of the motifs corresponds to preconceived geometric schema, the "starry pentagon" and the "convex pentagon". Le Corbusier justified these geometric figures by comparison to medieval example. He thus intended to represent a modern restatement of traditional religious practice and to affirm the cultural lineage of his concerns. He identified the essential motifs of the ceremonial door as "sun, moon, birds, the convex pentagon, the starry pentagon, clouds, sea, meanders, windows, and two hands...". Each had a precedent within Le Corbusier's iconography, to each he had attributed a specific and personal significance. At Notre-Dame-du-Haut he combined motifs from his notational system employed in urban planning schemes and in his Modulor. Similar motifs also appeared in his paintings and murals.
On the lower left-hand corner of the ceremonial door (exterior face) is a white wavy line, recognizable as the "meander", the slow and wasteeful "natural" pathway unenhanced by man's endeavours. The meander had a contemporary urgency in the context of Le Corbusier's C.I.A.M. grid of 1949. Here it became the "v-4" parameter symbolizing the vestige of tradition and history evidenced in old winding paths still visible in man's environment. First used as a term of derision in *Urbanisme* (1927), and expressed in the words "chemins des ânes", the meander developed into a concept given philosophical implications in *Précisions* (1930) where it took the form of the "loi du meander", "a miraculous symbol used to introduce propositions for urban and architectural reform".

Prominently displayed on the exterior door face are the two hands listed by Le Corbusier as among the essential motifs. The blue hand appears to be in a gesture of action, of receiving, or of giving. The other, red with outstretched fingers slightly curved, suggests a gesture of welcome. The hand had a long and important place in Le Corbusier's development of a personal iconography. As with the "loi du meander", it found its broader application as a philosophical statement, that of the open hand, "willing to give and to receive". The hand was a motif important to Le Corbusier not only for the many rhetorical uses to which he could put it, but also for its formal values. Having its first major sculptural manifestation in the giant hand incorporated in the Vaillant-Couturier monument in 1937, it was later given architectural form at Chandigargh. In both instances it possessed strong emotional attachments. The form itself was to undergo many transformations; the most telling was the metamorphosis of the hand into a bird, much like the one ornamenting the war memorial pyramid at Notre-Dame-du-Haut. Here,
because of the context, the hand-bird takes on the additional association of the dove, bird of peace and hope. (Fig. 16).

The windows to which Le Corbusier refers in *The Chapel at Ronchamp* appear to be the two rectangular forms found between the two hands (Fig. 17). The transparency of glass is suggested by the indication of a background perceived through them. Windows, the views they frame, the "negative" space they introduce into the "positive" plane of the wall, and the problems they present with respect to light, heat, and visibility, had long been among the problems which involved Le Corbusier. Also, the window placement was an expression of the freedom inherent in the use of new construction methods. The attempt to come to terms with this new freedom led to work with "tracés" and the *Modulor*. The window presented a challenge to his philosophical aims of relating man to nature, his functional aims in controlling the interior environment, and his aesthetic aims of creating a balanced, controlled, and proportioned facade. Hence, the window had architectural, moral, and social ramifications.

The clouds also mentioned by Le Corbusier are found on both the exterior and interior faces of the door. For Le Corbusier the cloud was essentially a sign of disguised optimism. It was not an unfavourable sign, but just another ubiquitous aspect of nature and the harbinger of beneficial rain.

Other forms also found on the exterior face of the ceremonial door appear to have specific references, although these are left undefined by Le Corbusier. The small triangular shape rising from the bottom section of the door could be interpreted as a land form. Forms such as this, with the same black mottlings, emerge in his urban study diagrams. The triangular and skewed pyramid shapes of the central area recall a number of
images used by Le Corbusier: pyramids, triangles, geometry generally, and Plato's five solids specifically. All of these have in common their association with the intellectual achievements of man.

Forms with variegated patterns derived from urban planning presentations are also placed on the interior door face. The triangular forms with the orb above are, when viewed together, strikingly similar to Le Corbusier's "jeu de soleil" motif (Fig. 33). It refers to a large constellation of ideas well known to those conversant with the writing of Le Corbusier. The spiral dominating the composition resembles that used by Le Corbusier to represent the Fibonacci spiral which figured predominantly in his work with the Modulor. The small floating forms suggest clouds repeating the function they were shown to have on the exterior. Giving order to these apparently disparate images is the "starry pentagon" and the "convex pentagon" mentioned earlier, which form the geometric framework upon which the images and their background are organized (Fig. 17). The importance of the pentagons lies in the control which they import to the design, a design feature Le Corbusier felt necessary to all great art.

It is obvious that the motifs chosen, and especially those pointed out by Le Corbusier, had a special meaning to him. However, the way in which they were juxtaposed also suggests a meaning has been hidden beneath their apparent random dispersal. When each of the motifs is interpreted independently, a cryptic depiction of the material world as it is manifest through time emerges.

The exterior door face with the "meander" and the natural unorganized forms at the bottom suggest a cultural and geological past. Above this the organization and work of man and perhaps civilization are recalled. Above all are the cosmic forces. The exterior door face suggests man's resources,
his endeavours, and the relationship between sky, earth, sea, and man within his 'paradise' on earth. By using such notational devices culled from urban planning, Le Corbusier sought to draw attention to his ideals and hopes for man in the newly dawning era.

On the interior door face the ascending, truncated triangle conveys a sense of creative force. It passes through an area containing a schematization of Le Corbusier's "jeu de soleil", a symbol referring to the natural order of things, and which signified to him the basis from which all architecture arose. The daily path of the sun, the twenty-four hour day, and the division into night and day is evoked by these assembled motifs. They appear representative of a cosmological order, but also of the making of order with all its creative energy more emphatically portrayed than on the exterior. The interior door face conveys the heat and volatile nature of creation. The containment of this energy by the Fibonacci spiral, with the guiding and beneficent hand above, suggests that even this creative power should, or can, be controlled. The Fibonacci spiral and the Modulor were just two of Le Corbusier's practical and personal controlling devices.

This idea of Paradise and the means by which to attain it were expressed by Le Corbusier many times and through many mediums, in sketches 1910-1965 (Fig. 34), in lithographs 1910-1965 (Fig. 35), and in words:

Habitation is life, knowing how to live! How to use the blessings of God: the sun and the spirit that He has given to men to enable them to achieve the joy of living on earth and to find again the lost Paradise. (1936)

These motifs were relevant not only to Le Corbusier but to the French Catholic Church as well. Abbé Bollé-Reddat, the resident priest at Notre-Dame-du-Haut, finds these 'signs and symbols' readily accessible to
religious implication. For example, in referring to the window motif on
the ceremonial door he adds the exclamation "Annunciation" (window
made to receive the light and allow it to pass into the interior). Below this window, "this sign of the Virgin," he is also able to intuit
"the meeting of the Earth with the Sky" - a hallowed place. It is an
apt description of the ceremonial door and the chapel as a whole. Appropriately, the Church too had its conception of Paradise which found its
symbolic and earthly representations in flowers and the gifts of nature
(Fig. 36).

The tabernacle of Notre-Dame-du-Haut consists of a cubic, cast iron box perched upon three planar supports (reminiscent of a miniature Esprit
Nouveau pavilion raised upon piloti) (Fig. 37). It had its impetus in
traditional prototypes which Le Corbusier refashioned into a form more amenable to his aesthetic. Its white enamelled surfaces are adorned
with images and colour. Although the tabernacle is a necessary piece of
court furniture - one of the most heavily shrouded in mystery and symbolic associations - there is no church stipulation that it be embellished with images such as these. However, it is suggested that the tabernacle
should be an ornamented receptacle which represents "a real dwelling of
God among men". Le Corbusier requested information about the dimensions,
uses, and iconography of the tabernacle and, on his own initiative referred
several designs to Canon Ferry for his selection. The sides have been
divided into three geometric areas with four images placed within: two
birds and two butterflies on the south, two flowers and two leaves on the
north. All of the images are rendered in the same manner as those found
on the windows and reiterate the same general theme. However, the re-
main ing east and west sides are different.
The front of the tabernacle contains free-floating abstract shapes that imply clouds, an interpretation strengthened by their blue colour and use elsewhere as such (Fig. 37). Striations, superimposed on these floating diaphanous shapes, suggest atmosphere and contribute to a sense of forms drifting within an undefined and unusual space. Within this space is a lamb outlined in black with a cross held between its forelegs. The lamb is emphasised by two slashes of blue which inscribe a right angle on it. Although the right angle has a great importance to Le Corbusier, the lamb motif is not known within his repertoire of imagery. It is therefore necessary to search for it within religious iconography.

As portrayed, the lamb is the traditional Agnus Dei representing Christ and signifying the prefiguration of His crucifixion. Le Corbusier emphasised the idea of crucifixion with a black, painted sketch of the crucified Christ on the attached cross above which the chi-rho is inscribed on its reverse. Such layering of analogous symbols was common in religious ornamental schemes and depictions. That Le Corbusier was aware of the analogies possible and the significance of associating these images is indicated by Le Corbusier's familiarity with the Isenheim Altarpiece, where a similar juxtaposition of images appear. Also, the figure of a youth carrying the lamb over his shoulders, which belongs to a group of prototype images for Christ, was known to Le Corbusier. He had a Greek statue of this subject in his Paris studio, and he had underlined the references to pagan precedents and relationships for the Christian pilgrimage to Ronchamp in its published history. It may be that the classical source of the Christian image suggested a universality in the motif and therefore attracted Le Corbusier to it. Le Corbusier enriched the tabernacle with new associations by coinciding the right angle with
the lamb. The right angle was an extremely important symbol to Le Corbusier which signified man standing upright in the landscape. In the same year he had celebrated the symbol in verse in his poem "Poem to the Right Angle".124

The back of the tabernacle contains a number of images which in their combination suggest a landscape scene (Fig. 38). A black line defines the horizon and white dashes allude to waves below it. Jagged shapes rising from a flat base suggest mountains and a barren tree and a variegated form of three V-shaped disks poised upon the horizon line contribute to the references suggesting creation and the separation of earth and water, or perhaps a sunset and the time of the Angelus.

The design of the back face is replete with symbols of death and rebirth, and of the power and beneficence of nature—earth, sky, and water. These are frequent topics discussed by Le Corbusier and essential to his understanding of architecture and planning. The creative process of nature burgeoning beneath the bareness (the tree has no leaves) and within the cosmos is here extolled. The themes of Crucifixion and the winter season, each a part of the cosmic and religious cycle of life, are poised as analogues. And, as if to confirm this metaphysical statement, a reinterpretation of it is found on a window in the south wall where image and reality coincide: the sun's rays signal the rebirth of day in a purple sunrise over a blue-green sea (Fig. 39).

Finally, Le Corbusier contributed new motifs to religious symbolism. He referred metaphorically to the ship's hull and the airplane in describing Notre-Dame-du-Haut.125 These have already been shown to have been important images for the conception of the structure. The use of metaphor was important for it was yet another means by which Le Corbusier sought
Le Corbusier emulated the modern ship for its efficiency in design and believed its modern forms applicable to architecture and industrial design. He also appreciated the ship as a haven. Therefore, although ship imagery has precedent in both architectural and religious thinking, its well-known and personal significance to Le Corbusier endows it with contemporary associations.

Reference to the airplane wing was another means of imbuing the chapel with modernity and an association with efficiency. Like many of his era, Le Corbusier saw in the airplane an effective tool for universal brotherhood and peace. His glorification of the airplane merited special consideration in his 1935 publication Aircraft, and his flying experiences were inspiration for poetic allusions in his writings of the 1930s. The airplane had also served as an image of the "new spirit" which Le Corbusier had associated with modernity in his 1937 Exhibition Internationale de l'Habitation. These images served to summon the ideas of modernity, precision, haven, and the optimism of man's future.

These forms had been used previously and consistently by Le Corbusier to demonstrate man's ingenuity, daring, and fight against mediocrity. The airplane and the ship had offered Le Corbusier architectural forms and influenced his view of the world and of man. They had inspired his philosophy of architecture and life and this inspiration influenced the forms of Notre-Dame-du-Haut. Notwithstanding the purely secular derivation of these two images, they were found to be appropriate by the Archbishop of Besançon and they were used by him as praiseworthy metaphors for the chapel on its dedication day. With the attribution of significance far beyond their structural function, these forms acquired the
significance usually associated with ornament.
CHAPTER VII

LIGHT

The all-pervasive symbol of the chapel is light. Light gives the chapel its mystical qualities, guides pilgrim practices, and gives life to form. Of all the elements that constitute Notre-Dame-du-Haut's greatness the control of light has the most to do with the command of structure. Of all the symbolic, sculptural, or decorative elements, light as manipulated by the architect produces in the spectator the most profound sense of religious mystery, a fact commented upon by virtually every critic.¹ And it is in the program for the handling of light that we can see how brilliantly Le Corbusier could function under the simultaneous conditions of severe economic restrictions and absolute professional freedom.

Prior to Notre-Dame-du-Haut the subject of light in church architecture, or in contemporary Catholicism-inspired literature, is only infrequently commented upon, with one relevant exception: Paul Claudel.² In modern religious thought light has not been given the metaphorical significance it once had as exemplified by Abbot Suger and Dionysian metaphysics. Nor is it especially emphasised in avant-garde architectural thought or practice for other than practical considerations, again save one exception: Sainte-Baume. Church design has tended to concentrate upon simplifying forms and rearranging spatial relationships,³ as in the work of Böhm, Schwartz, Metsinger, and Perret. In modern non-ecclesiastical architecture light has been associated with moral imperatives, and a line of thought in this respect extends from Morris and Ruskin to Le Corbusier and his contemporaries.⁴
There had of course been experiments in modern church architecture before Nôtre-Dame-du-Haut and some are quite interesting with respect to light. In 1923, at Nôtre-Dame-du-Raincy, Perret had introduced light filtered through stained glass embedded in patterned claustras, simulating the order of the spectrum. Dominicus Böhm had introduced a lighting scheme with a single light-intensive area over the altar at St. Englebert, Cologne-Riel in 1930. A similar lighting arrangement had been created in France by Dom Bellot, a Dominican monk, at Audincourt in 1930. The fact that the lighting innovations of Dom Bellot were not appreciated by Père Couturier in particular and not often repeated by other French architects, plus the fact that Perret's poetic statement with light was not emulated nor its possibilities seized upon seems to point out theological disinterestedness in this area.

There was a resurgence of interest in stained glass in ecclesiastical architecture prior to Nôtre-Dame-du-Haut but it was used and appreciated for figurative detail rather than the metaphorical significance of the ambiance of light it created.

Surprisingly, and in general, architectural writing and critiques of the period rarely isolate light as a topic meriting special considerations, other than practical ones, whereas they regularly treat structure, form, and even colour in this way. Père Couturier, the leading French exponent of avant-gardism, provides a representative example in his discussion of the church at Assy, whose decoration he supervised. Nowhere does he use light as a metaphor for religious experience.

A more contemporary and practical problem occupied the clergy and Church at that time - the problem of electric lighting. Imitation candle sticks, visually prominent and distracting light fixtures, and the
proliferation of light-accessorised devotional objects (such as Christ figurines with illuminated hearts), posed aesthetic as well as functional problems. Particularly distressing to the Church at that time were the indiscriminate introduction of electric light and the theatrical effects often sought. As early as 1932 the introduction of electric light had been sufficiently disruptive to merit special comment by Rome. In France the problem was countered by *Les questions liturgiques et paroissiales* in the same year. Although the latter does not have the power of an official proclamation, it does indicate the way in which light was approached in official French Catholic circles as a question of tradition and necessity. The decree states that "electric light (was) never able to immediately serve the cult", but that "it was permitted with the consent of the Ordinary", and if it was seen to "diffuse the shadows and to illuminate the churches with more splendor than formerly with the condition that one carefully evade all theatrical effect and that one respect always the gravity which suits the sanctity of the place and the dignity of the sacred liturgy". At Notre-Dame-du-Haut, Le Corbusier made minimal use of electrical light.

It is obvious that the introduction of electric light took interest away from the older systems of interior illumination, undermining its role in determining spatial hierarchy. Natural light had established the dim nave and predominantly-lit sanctuary. For those who still advocated that the sanctuary be shrouded in obscurity and mystery, the introduction of elaborate light fixtures above or within the space was viewed as a disturbing element. However there was no consensus in the literature of the French ecclesiastical avant-garde as to what light quality was best. Furthermore, in *Mediator Dei* of Pope Paul XII of 1947 there is no
specific mention made of light. The only reference made to architecture is a general exhortation "to use modern materials, but to do so prudently and to preserve the correct balance among styles, tending neither to extreme realism, excessive symbolism, nor that which will openly shock".

To summarize, just prior to the Ronchamp project, ecclesiastical criticism overlooked the poetical potentials of light in its concern with the abuse of electric light. Where light does figure predominantly as an organizing element, it tends to take one of two standard forms: light is either focussed on the altar, as with Dom Bellot, or the nave is flooded with light, as with Perret.

It is important to note, however, that while light as a religiously significant metaphor does not occur in official Church decrees prior to the completion of Notre-Dame-du-Haut, and while it is not emphasised in the writings of Père Couturier or Père Régamey, light does occur as a theme in less specialized and more widely read literature. In Paul Claudel's drama, L'Annonce Faite à Marie, light indicates the religiously significant times of the day, which are given their traditional association. Early dawn or the still evening of the Angelus signify the presence of the Virgin. Furthermore, in this play the connections between the Catholic cycle of daily and seasonal time to that of the natural world is strikingly similar to the connection between light and the day to be discovered in the ornamentation at Notre-Dame-du-Haut. Significantly, this very play by Paul Claudel is cited at some length in Le Corbusier's Modulor of 1949. Also, Le Corbusier requested the quote from Paul Claudel that Archbishop Dubois had used at the consecration ceremony at Notre-Dame-du-Haut; and a line from Paul Claudel appears in Le Livre du Ronchamp:
"comprends cette parole a l'orielle de ton âme".  

Given the extent of Le Corbusier's references to Paul Claudel and, through him, the extent of his response to the traditional correspondence between light and the sacred experience, it seems that Charles Jenck's criticism of Notre-Dame-du-Haut as "ironic" is unfounded. Le Corbusier earnestly sought the incorporation of modern poetic sensibility into his edifice.

Perhaps more indicative of the architect's attitudes than these literary parallels of thought is the single modern architectural predecessor where light does figure as an important spatial element, his own Sainte-Baume project of 1948. Le Corbusier's design was as "of its day" and "reality-infused", as was Claudel's visionary church for Chicago of the 1930s where 'futurist' images and 'realist' acceptance of modern technology and materials were to be expressed. It was also an opportunity for Le Corbusier to practice his luminary vision since the lighting scheme was left entirely to his direction.

One earlier project should perhaps be mentioned. Much earlier than Sainte-Baume was Le Corbusier's participation in the interior decoration of the 1907 chapel at Cernier-Fountainemelon, near La Chaux-de-Fonds, which was replete with cosmological motifs and expressive of an awareness of the natural order in which the sun and life-forms figure prominently.

At Notre-Dame-du-Haut, the importance Le Corbusier gave the problem of light is demonstrated by its high priority in design decisions. Initially the chapel was designed to be composed of simple shapes united into a single mass that would stand out effectively upon the summit. It is in the later plans marked 'éclairage' that the most significant changes are noted (Figs. 40, 41). For instance, an interior vestibule at the south
door was eliminated, thereby removing an intrusive element into the nave space. The door became a single large expanse hung on a central pivot. In this form the south door plays a greater role in the lighting scheme; with the opening of the ceremonial door one great shaft of light is introduced, substantially adding to the illumination offered by the sidelights which in the revised scheme now directly illuminate the nave. In addition, this light adds dramatic emphasis to the act of entering. In the earlier scheme no light from the door would have been visible in the nave, due to its screening by partition walls.

Other changes indicate the developing concern for the light of the chapel. The elimination of the window of the northwest chapel and the consequent reliance on the light from the lantern demonstrates the desire to create a unified method in the lighting scheme. As a result of the change, all the chapels are now lit directly only by their own lantern towers, and since each is oriented in a different direction, the light is caught at different times of day.

The changes initiated at this time had an effect not only on the interior but also on the exterior. Light considerations affected the forms of the four facades at an early stage in the design. This interest accounts for the vertical and inward cant of the south wall, which is responsive to the vertical position of the sun, and the convex and concave line of the walls, which is most responsive to the horizontal movement of the sun. In the later (1951) 'éclairage' plans, these curves are accentuated. In addition, the roof was altered to increase the eave overhang on the south and east while reinforcing the abrupt end of the roof at the meeting point of the north and east walls. This alteration had an important effect on the south and east facades, greatly increasing the range
of light to shade and shade to light. The variation in window types found in the north wall, despite its consistent structural system, and the unnecessary, although poetic, battering of the south wall (unnecessary because reinforced concrete, not gravity and masonry account for its stability) emphasise the priority given to light over structural expression.

The changes made to the plan in 1951 follow the acceptance of the design by the Commission for Sacred Art for Besançon in January of that year. The patrons asked only that the design be reduced in size. The reduction in size, however, does not account for the other modifications, whose greatest effect was on the light qualities of the chapel.

The writings of Le Corbusier abound with discussions of the significance of light; it is found in his exposition of architectural theory, in urban planning, his poetry, and in his emotional responses to architecture, more specifically historic, religious architecture. In his own architecture this sensitivity can be seen in the light wells of the Villa Savoie, the lighted stairwells of his own apartment, the lighted 'architectural promenade' of the Auteuil houses, and the designing of facade forms to best relate to the direction and height of the sun's rays, as for example as Algiers. He had also invented the brise-soleil, first applied at Rio de Janeiro in 1939, to control the flow of light into the building. The treatment of the facade at Notre-Dame-du-Haut is consistent with an earlier definition given the facade by Le Corbusier:

The façades are considered as the carriers of light...the façade no longer carries the floor nor the roof; it is no longer but a veil of glass or of masonry, enclosing the house.

The importance which light assumes at Notre-Dame-du-Haut is also perfectly in keeping with one of his most important tenets of urban theory, "the essential joys: sky, trees, view and sun." The early priority
given the sun in design decisions was not rooted solely in aesthetic concerns, but also involved a philosophical and moral interest. Le Corbusier believed that the solar day is the controlling factor in all our activities, and that since light was thought linked to good health, its provision was a moral responsibility of the architect. Thus even the pronounced aesthetic role given to light at Notre-Dame-du-Haut has its initial impetus in social, moral, and structural imperatives. Light remains "aesthetics directly connected to utility", the implied meaning of functionalism given by most adherents of the Modern Movement and Le Corbusier. The fact that the Church and the congregation find that the chapel functions "perfectly" confirms that the social and functional requirements of light have been met. However, the "psychophysiological" effects of light were Le Corbusier's major concern at Notre-Dame-du-Haut and poetically restate, and almost cause the viewer to forget, his original moral rationalization of his interest in this element.

Le Corbusier's 1932 epigraphic statement about the 24-hour day developed into a ubiquitous diagram of the sun wave traced by the sun in relation to the horizon. It was this diagram which Le Corbusier used to indicate what he believed to be the starting point of architecture, namely, a consciousness of the cycle of the day and therefore the daily cycle of man's life. This statement is most emphatically and repeatedly made throughout his writings, more so and more consistently than any claims of the same magnitude about technology, mechanization, or materials.

Le Corbusier's major interest in light is shown in his 1927 description of the light effects at Auteuil. Even at this date, the aesthetic is given equal importance with the technical and utilitarian:
One follows an itinerary and the perspectives develop themselves with great variety, one plays with fluctuations of light illuminating the walls and creating shadows.48

In 1923 at the Maison la Roche, Le Corbusier had manipulated light into the very center of the house. He speaks about giving light a priority in the following way:

...tormenting the plan because of the site...the need for the sun from the south and channeling it into the house.49

The light design at Notre-Dame-du-Haut can be explained in terms of economy and efficiency. It is apparent that the incorporation of adequate electric light was not foreseen for the immediate future and the design of the chapel would have had to accommodate the restrictions inherent in relying heavily on natural light.50 The light shafts of the side chapels can be seen as an ingenious solution to the problem of illuminating an interior space requiring both privacy and differentiation from the main part of the interior without the introduction of partition walls or numerous separate light fixtures.

Light plays an important role in the modulation of the interior spaces. It not only defines different areas in terms of liturgical functions, but its quality also corresponds to the appropriate religious experience. The lighting of the interior - dimmer in relation to the exterior - contributes to the sense of quiet and peace experienced within. The dimness is essential in creating the calm and meditative atmosphere so frequently mentioned in visitors' references to the interior 51 and is the most important quality of sacred space to Le Corbusier. Each area with its specific liturgical function has been given its own lighting characteristic: each is rendered distinct yet not divorced from the total space of the interior.53 Nor are the distinctions static. The nave and
subsidiary chapels all have their own particular time of prominence as marked by a greater degree of illumination which each receives in relation to the others at different times of the day. Thus intensity of light announces when each area may be optimally used. The sanctuary with its bright pinpricks of light - their brilliance increased by their smallness in relation to the wall - provides a focus in the early morning. The intensity of the sanctuary light contrasts the coloured, diffused, and therefore less intense light of the northeast chapel. The duration of direct illumination is greatest in the nave due to its long stretch of windows along the south wall and their varied dispositions within the wall embrasures. The southwest chapel, which is the largest and most used, has also been given the most steady light, 'the dependable north light'.

The shape of the light turrets proclaims their function of channeling light downward into the side chapels. Candles lit on the altar and the Paschal candle to its left aid in the illumination and demarcation of this special area. Unobtrusive electric light was added and later supplemented. It was placed at floor level to complement the orchestration of natural light.

In addition to the areas within the chapel, light serves to create a space of a more dynamic nature. Flowing through the ten centimeter crack between the wall and roof, and between the junctures and infoldings of the curving wall planes, through the brise-soleils over the north and east doors, and through the sidelights beside the south door, it unites the outer spaces with the interior and imparts to the inner space a sense of unbounded expansiveness.

Visibility of the outside world, especially as glimpsed through the small windows of the south wall, also serves to expand the space outward.
Thus the light not only defines an interior space, but simultaneously initiates an experience of dynamic space beyond and around the "bounding walls". The tension of interior and exterior space being viewed simultaneously results in a dynamic equilibrium, expressing another long-held architectural tenet of Le Corbusier's and providing another appropriate metaphor for the Church as a modern dynamic institution. The tension between interior and exterior is also appropriate to a Church which often defined itself in terms of dualities.\(^{56}\)

On the exterior, light is again used to shape and heighten the experience of both localized and expansive space. Controlled by the surrounding surfaces, the light creates nuanced pockets of space interrelated with the environment. Shadows create a constantly changing pattern which provides a sensation of movement both horizontally in response to the sun's movement, and in depth.

The use of light to unify the edifice with its surrounding environment aesthetically relates it to a pronounced feature of the Modern Movement. It is a reflection of such ideas in painting and sculpture as are expressed in the painting and sculpture of Boccioni, Picasso, and the painting and sculpture of Le Corbusier.\(^ {57}\) In architectural parlance, it is closely associated with those advocating an integration of architecture with the site—physically or metaphysically. Not only is this an aim of Le Corbusier's which finds realization in his work at Auteuil, Pessac, Poissy, and the more contemporary Rob et Roq,\(^ {58}\) it is also a major concern of church officials attempting to provide siting guidelines for parish churches within the newly developing suburbs.\(^ {59}\)

The space created and evoked by the light has an ecclesiastical significance as well. The role in giving meaning to liturgical spaces
has already been mentioned. It should also be noted that the desire for an aesthetic and spiritual experience of expansive space is particularly appropriate to the Church at this time, especially to the avant-garde patrons for whom Le Corbusier was working. Expansiveness is a fit metaphor for the ideals of those clerics during the span of freedom they enjoyed between 1935 and 1955. The interior-exterior tensions which contribute to the creation of "l'espace indicible" is also an astute metaphor for an edifice whose purpose is a spiritual union which in the final analysis is left inexplicable.

But the control of light and light symbolism goes even further. As did Paul Claudel, Le Corbusier has synchronized the apperception of light within the chapel to the times of day. At Notre-Dame-du-Haut the sun has been given controlling power by the arrangement of the apertures transmitting its light to the interior. The shape and cant of the south wall windows, the orientation of chapel domes to three cardinal points, and the variations in the ratios of light to dark and solid to void all contribute to this. Light has been controlled and distributed to animate as well as to illuminate the edifice.

Light flows from pinpoint holes in the east wall. It flows from huge files of space above the north and east doors and from the sidelights flanking the ceremonial entrance. It appears at junctures in the building fabric and points out passageways. It distinguishes nave from sanctuary and side chapel from nave in an orderly progression from light to dim, and alternately from dim to light. In addition, the sun has been used to create crescendos of light within the edifice. As the sun rises in the east, it enters the chapel from the tiny holes in the east wall. As it rises higher in the sky, the light admitted from the east tower becomes stronger,
as does the light from the east wall, until, towards noon, a blazing file of light bursts forth from the tall brise-soleil in the southeast corner. The sun then continues towards the west, its path monitored by the south wall. Although the angle of the embrasure of these windows appears random and does diffuse an even light, there is a greater number of them angled towards the center of the nave and directed so as to focus the rays of the mid-afternoon sun. This crest of light is not obtrusive nor distracting. It has been controlled. The shape and recession of the south brise-soleil and the large overhanging eave in both east and south moderate the extreme points of the light passage. However, the two most emphatically 'illuminated' points in this crescendo of light, late morning and mid-afternoon, are the times of the Masses held for the Virgin, 11:00 a.m. and 2:30 p.m. While the actual light of the sun dictates these periods, one is reminded of the reference to the "etoile du matin" in the northeast chapel and the ready association to the Virgin.

Light is asked to play no functional role on the exterior of the building save providing visibility in the exterior sanctuary, and this purpose is served by the large light-reflecting, open curve within which the exterior altar is set. Brightness is emphasised on the exterior, in contrast to the dimness in the interior. But here too the path of the sun is monitored, its passing recorded in the changing forms of the shadows. What is marked on the inside by the movement and intensity changes of light is marked on the outside by the nuance of shade and shadow. The manipulation of light over the surfaces and within spaces for other than practical purposes, as was done at Notre-Dame-du-Haut, can only be called ornamental. In recalling Le Corbusier's high expectations of ornament this becomes significant. At Notre-Dame-du-Haut he emphasised:
The key is light
and light illuminates shapes
and shapes have an emotional power. 63

Although Notre-Dame-du-Haut has been termed 'lyrical' and personal
in its imagery, 64 its significance to the architect and to traditional
church architecture have not been explored in the depth merited. Le
Corbusier had often asserted that architecture played a major, perhaps the
major, role in determining the happiness of man. He was equally convinced
that architecture meant something beyond its engineered parts. 65 One of
the materials that Le Corbusier used to create his architecture was light.
In this he was preceded by Phidias, Callicrates, Ictinus, and Michelangelo,
all creators of sacred space. There is a great tradition and precedent
for the linking of light and that "something more" within religious thought
and architecture attested to by Abbot Suger. In the more recent past, there
is the nineteenth-century heritage of the Impressionists' preoccupation
with light and that of the architects', first heralded with the Crystal
Palace. 66 There is also the emphasis given to the creation of sacred
space in terms of light at the Sainte-Baume project and Pere Couturier's
tangential interest in stained glass which would have impressed upon Le
Corbusier the still significant power of this expressive architectural
component. Light also figures greatly in other religious cults; Le
Corbusier noted this similarity in the Egyptian and the Greek as well as
the Islamic. 67 There is a large cultural context to which Le Corbusier
may be referring with his emphatic and suggestive use of light, and he
translated that tradition into modern terms, including references to
modern thought such as that of Paul Claudel. By infusing light with
sincerely felt ideas he sought to infuse his whole chapel with relevance
to its contemporary context.
CHAPTER VIII

SUMMARY AND CONCLUSION

The initial inspiration for this study of Notre-Dame-du-Haut, Ronchamp, originated with two major issues. The first was the relationship of the chapel to Le Corbusier's established aesthetic. The second concerned the relationship and appropriateness of Le Corbusier's architectural theory and forms to that of French Catholicism.

The chapel was shown to possess many recognizable and established Corbusian characteristics. The use of memory through the culling of the most prominent features of sacred building evidenced, I believe, an architectural manifestation of Purism and a continuation of the interest in symbolic form discoverable in Le Corbusier's architecture of the 1920s. The use of pure forms and their massing in light confirmed Le Corbusier's definition of architecture that was formulated in Vers une architecture in 1923. The selection of forms which had some semblance of functional application betrayed a twentieth-century interest that sought aesthetic justification by reference to utility. The basic attitude to form, materials, and structure was shown to have had its first theoretical statement in 1923 and its application in Le Corbusier's buildings of that era. The curves, inclined surfaces, and skewed geometric forms were a synthesis of pre-existing aesthetic aims and established practice that included the transposing of discoveries made in one art form into another and current formal explorations. The study suggested that the particular forms found at Notre-Dame-du-Haut were inspired by their independent and simultaneous discovery in nature (the shell), mathematics (the Modulor),
human shapes (the ear, the hand), and Le Corbusier's contemporary sculpture. The expressive aims which appear to have directed the creation of form at Notre-Dame-du-Haut were demonstrably consistent with Le Corbusier's 1923 definition of Architecture that distinguished the latter from building by its inclusion of expressive concerns. Moreover, these aims did not impair the functions of the chapel. As a comparison with the former church illustrates, Le Corbusier greatly improved their accommodation.

The use of ornament was shown to have had its basis in early Corbusian theories of aesthetics and society. However, Notre-Dame-du-Haut also proved to be more than a restatement of earlier design solutions; it was an evolutionary step proceeding from them. The ornament at Notre-Dame-du-Haut reaffirmed the uses it served in his chapel of 1907, which were to establish the human contact Le Corbusier attributed to the collective, participatory realm of conventional decoration and to act as a "clue" to those uninitiated to the higher realms of pure objective form. Additionally, it participates formally and objectively in the design, contributing colour, form, and rhythm. The motifs at Notre-Dame-du-Haut clarify the realistic aspects of Le Corbusier's theory while they simultaneously continue and enrich the poetic and visual traditions of French Catholicism (Figs. 42, 43).

The religious context of the commission was the second issue explored in this study. The importance given to style, the act of creation, and human initiative by the focus placed on the arts and their attendant controversies by Père Couturier, Père Régamey, and Canon Ledeur were shown to have had much significance to Notre-Dame-du-Haut and to Le Corbusier. These ecclesiastics and others possessing similar aesthetic aims created the context in which the cultural and social importance which
Le Corbusier attached to his architecture could be recognized. For in the contemporary catholic literature the experience of art, religion, and social and economic change were interrelated. They were thus prepared to believe that a sincere and individualistic statement such as Père Couturier had already applauded in the work of Léger expressed a positive contemporary spirit.

Indeed, the study revealed that interesting parallels of aesthetic theory and spirituality existed between Le Corbusier and his French Catholic patrons. These parallels give substance to the many metaphors and visual analogies that were discovered in the chapel. Le Corbusier defined the creation and experience of architecture as "a direct call into the absolute...a sermon on the mount". The Church too was concerned with the essence and mainspring of creativity and its relationship to faith, genius, and the inexplicable manifestations of inspiration or divinity. Just as Le Corbusier had related the experience of the ineffable with that of faith and spirituality, so too did Père Couturier equate the artist and the religious man. For these reasons the Church, and especially the small group of ecclesiastics then experiencing exceptional freedom, were willing to recognize Le Corbusier as "an artist with the greatest sense of the sacred".

Le Corbusier enriched the popular image of a religious edifice by the inclusion of his many secular and aesthetic aims. They were not whimsically, but sensitively, included. Thus the exploration of acoustics and visual acoustics, colour, light, space, and decoration aptly represented a contemporary catholic concept; meditation paralleled spiritual communion, the individual's voice demonstrated the integral importance of private devotion, expansive space suggested freedom in faith, decoration
recalled human and earthly responsiveness, and metaphors referring to creativity recalled the miracle of life and cosmic order. Finally, the Le Corbusier persona, known for its concerns of human welfare and human habitation aided the popularization of the Church as the House of God, a metaphor emphasised in *Mediator Dei*. With the incorporation of forms evocative of several civilizations and different eras, including the present, the chapel epitomised the traditionalism combined with universalism which the Church wished its image to be. Moreover, the high design priority given to the psychophysiological responses appropriate to pilgrimage and devotion to the Virgin demonstrated the analogous situation then felt to exist between aesthetics and spirituality. The immediate responses crafted by Le Corbusier served magnificently as analogues to the spontaneous sense of the sacred so much desired by reformers within the Church.

In summary, it has been shown that the chapel has many features pertaining to the larger context of French Catholic philosophy and involvement in the arts than that which the attribution of the chapel's date or architect would fully convey. For instance, it can be shown that the chapel expresses the thematic concerns and displays the imagery of the contemporary catholic poet, Paul Claudel. It incorporates the literary and schematic devices of contemporary, avant-garde French Catholic art, such as that found at Assy, Audincourt, and Vence. The chapel also demonstrates an interpretation of pilgrimage planning with an inclusiveness equal to its contemporary Lourdes as well as its Medieval prototype. In its political dialectic the chapel bears witness to the heroic actions of the Dominicans and the patrons involved in the Commission in their efforts to revitalize Christian art and exhalt the freedom of faith. In its incorporation of obvious Corbusian and secular references the chapel
extends the pilgrimage beyond its purely religious context to the wider, uninitiated world beyond, giving a place of refuge to anyone - so appropriate to the ecumenical era of the 1950s.

Thus, the chapel was shown to be a nexus of contemporary spirituality and a succinct expression of those ideals shared by Le Corbusier and French Catholicism.

In conclusion, it has been shown that Notre-Dame-du-Haut did not, like Athena, spring from the head of Zeus fully formed. Notre-Dame-du-Haut evolved out of an architectural theory first presented in Vers une architecture in 1923 and was prompted by the spiritual milieu which formed its programmatic context. Notwithstanding the intriguing and heavy indebtedness which the chapel's conception was shown to have to Ruskin and the nineteenth-century philosophy which informed Le Corbusier's earliest sense of the sacred, aesthetically and spiritually the chapel celebrates the twentieth century (Figs. 44, 45).
FOOTNOTES

INTRODUCTION


8. Rogers, "Il metodo di Le Corbusier," pp. 3-6; Couturier, "Le

9. This is especially noticed in the writing of Rogers, "Il metodo di Le Corbusier," pp. 3-6 and Abbé Bollé-Reddat, Notre-Dame-du-Haut à Ronchamp (Zurich: Verlag, Schnell and Steiner, 1976).


CHAPTER I


15. Couturier, "Le Corbusier, Ronchamp," p. 29; Bollé-Reddat, *Notre-Dame-du-Haut a Ronchamp*, p. 3. A letter from Canon Ledeur to Le Corbusier dated 14 April 1951 indicates that the project was only awaiting the necessary financial approval of the parish.

16. Abbé Besançon to Le Corbusier, 13 March 1951, Fondation Le Corbusier, Paris. These are Old French francs. They have the exchange rate of 100 Old French francs to 1 New French franc, and were changed 1 June 1960.


25. ibid.


34. Jordan, le corbusier, p. 132.


36. ibid., p. 6.

37. ibid.

38. ibid.


42. Canon Ledeur to Le Corbusier, 23 April 1951, 1 May 1951; Le Corbusier to Canon Ledeur, 19 April 1951, Fondation Le Corbusier, Paris.


44. Le Corbusier, Oeuvre complète 1946 - 1952, p. 88. Finances
were assured between 1 May 1951, at which date a letter from Canon Ledeur to Le Corbusier indicates discussion concerning finances still continued, and spring 1952 as indicated by Le Corbusier in his Oeuvre complète 1946–1952.

CHAPTER II


2. ibid.

3. ibid.


5. ibid.; Hammond, Liturgy, p. 9.


7. ibid.

8. ibid.

9. ibid.


17. Pichard, Églises Nouvelles, p. 139.

18. ibid., pp. 24-25; Regamey, Religious Art, p. 228; Pope Pius XII, Mediator Dei, p. 63.


21. Pope Pius XII, Mediator Dei, p. 65.


23. Pope Pius XII, Mediator Dei, pp. 45, 62.

24. ibid.


42. Couturier, "Religious Art," pp. 3-6; Rubin, Modern Sacred Art, p. 171.

43. Rubin, Modern Sacred Art, p. 36; Gauthier, Le Corbusier, p. 19.

44. Jordan, le corbusier, p. 132; Couturier, Se Garder Libre, p. 49.

45. Montalte, La Basilique, lacks pagination.

46. Couturier, Dieu et l'art, pp. 256, 288-89.

47. Jordan, le corbusier, p. 144.

48. ibid.

49. Le Corbusier, Le Livre de Ronchamp, p. 166.


52. ibid., pp. 62, 63; Doncoeur, "Esthétique Moderne et Art Sacré," pp. 89-97.


63. Ibid., pp. 23, 183.

64. Ibid., p. 183.


68. Ibid., "Comité de Patronage," p. VII.

69. Ibid.; Ibid., "À Propos d'Art Sacré," p. VII.

70. Ibid., "À Propos d'Art Sacré," p. XI.


72. Ibid., p. 232.


74. Ibid., p. 224.

75. Ibid., pp. 229-30.

76. Ibid., pp. 20-21.
77. ibid., pp. 222, 225.

78. ibid., pp. 230, 226, 227.

79. ibid., pp. 83, 29.

80. ibid., pp. 132-33.

81. ibid., pp. 24, 25.

82. ibid., pp. 83.

83. ibid. pp. 17, 18.


93. ibid.

94. ibid.

95. ibid.

96. Marcel Ferry to the writer, 25 June 1978, Vancouver.

97. Ledeur, "Célébration" p. 20.

98. ibid.

99. Canon Ledeur to Le Corbusier, 23 April, 1951.
100. Ledeur, "Célébration," p. 15.

101. ibid.


104. ibid., p. 17.


106. idem, Le Livre de Ronchamp, p. 18.


109. idem, Towards a new architecture, pp. 18, 47. This is a translation of the 1923 Vers une architecture.


111. Ledeur, "Célébration," p. 16.


113. ibid.

114. Each of the three stages added its contemporary concerns to the evaluation of past Church building achievements. The second stage is represented by a group of books that appeared after World War II in which many of the churches that were considered exemplary of a modern style in Munier's book of 1932 were deleted. Additionally, an expanded historical context was thought an appropriate editorial accompaniment and social context was much emphasised. Les Églises Nouvelles (1960) by J. Pichard, Modern Church Architecture (1962) by A. Christ-Janer and M. Mix-Foley, and Liturgy and Architecture (1961) by P. Hammond are the major books of the second stage. These three books, and especially Hammond, stressed the importance of the liturgical movement in shaping the new and varied developments of modern church architecture.

The third stage in the documentation of modern church architecture shows a shift in historical perspective. This is noticeable in L'Architecture Religieuse Contemporaine en France (1968) by G. Mercier and Guide des Églises Nouvelles en France (1969) by J. Capellades. Here a greater number of churches considered modern in the earlier surveys were deleted. Most of the remaining examples were relegated to the status of precursors and few of the examples cited in either of these surveys date from before the completion of Notre-Dame-du-Haut, Ronchamp.


121. Champigneuille, Perret, p. 47.


123. Schnell, Architecture in Germany, pp. 41-48.

124. Champigneuille, Perret, p. 38; Collins, Concrete, p. 240.

125. Pichard, Églises Nouvelles, pp. 61-64; Régamey, Religious Art, p. 231.

126. Rubin, Modern Sacred Art, p. 44.

127. ibid.


129. Pichard, Églises Nouvelles, pp. 24-25; Rubin, Modern Sacred Art, p. 77.

130. Rubin, Modern Sacred Art, pp. 45-63.


133. Rubin, Modern Sacred Art, pp. 45-63.

135. ibid., p. 16.


CHAPTER III


2. The completion of a pilgrimage imparts a sense of accomplish­ment, and therefore pride to the participants. This is expressed in Paul Claudel's Annonce Faite à Marie (1912). Père Couturier also emphasises the personal and human aspects of pilgrimage in his personal journal. Couturier, Dieu et l'art, p. 230. Le Corbusier also associates pride in personal achievement and quest with pilgrimage, although of a secular kind. Le Corbusier, When the Cathedrals Were White, p. xix.

3. Hammond discusses numerous types of plans, historical and con­temporary, but he makes no mention of pilgrimage churches or plans distinctive to them, see Hammond Liturgy. The same situation can be noted in Pichard, Églises Nouvelles; Mercier, L'Architecture Religieuse; Capellades, Guide; Munier, Un Projet.


5. Montalte, La Basilique, lacks pagination.


10. ibid., p. 93-94.

11. ibid., p. 93.


14. Canon Belot, Notre-Dame-du-Haut a Ronchamp (Manuel du Pelerin) (Lyons: Editions Lescuyen, n.d.), pp. 9, 12, 13, 24-5. It is merely the Virgin that is referred to in most documentation, including that of Abbé Bolle-Reddat. However, the statue is of the Virgin holding a child in her arms. The chapel is dedicated to the Nativity of the Virgin. Capellades, Cocognac, Couturier, Les Chapelles, p. 108.

15. Belot, Notre-Dame-du-Haut, p. 3.

16. ibid., p. 10.

17. ibid., p. 17. Belot states that the first mention of an event associated to the Nativity of the Virgin occurs in a thirteenth-century document dated the first Friday after Nativity of September 1271 that granted special safety in the vicinity by Count Othon IV of Burgundy. This would be important in establishing the association of refuge so important and recurrent in the popular accounts of the chapel's history.

18. Bolle-Reddat, Notre-Dame-du-Haut, p. 5. Although Bolle-Reddat records the presence of pilgrims in 1271, Belot does not. The pilgrims mentioned by Bolle-Reddat may have been on their way to Compostella and took advantage of the newly granted safe passage.

19. Belot, Notre-Dame-du-Haut, p. 25. It was probably at this date that the chapel received its dedication to the Nativity of the Virgin because it is difficult to change the dedication given to a church according to canon law.


22. ibid. The new church became Notre-Dame de la Sainte Vierge or Notre Dame de Septembre.

23. ibid.

24. ibid., p. 25. In 1778 exvotos attest to attributions of the miraculous with the site. In 1873, 3,500 pilgrims gathered at Ronchamp on September 8 and in 1926 12,000 pilgrims gathered for Corpus Christi. Notre-Dame-du-Haut was able to evade the repercussions of the Republican era which confiscated the sanctuary as a national good because it was bought by forty-five parishioners and became private property. Consequently, when the Law of Separation confiscated Church property in 1906 the chapel was again saved by its status of private property. This greatly enhanced the chapel to neighbouring parishes who had no other access to a church. Belot, Notre-Dame-du-Haut, pp. 23, 27, 50, 23-25.

25. ibid., p. 37.
26. Bollé-Reddat, _Notre-Dame-du-Haut_, p. 22. Bollé-Reddat refers to September 8 as a traditional regional pilgrimage and adds that there are pilgrimages from Easter to All Saints. Belot states that the major pilgrimages are Corpus Christi and the Nativity. Belot, _Notre-Dame-du-Haut_, p. 4.


28. ibid.

29. ibid.

30. _Dictionnaire des Églises de France_, 1967 ed. s.v., "Lourdes".

31. ibid.

32. ibid.


34. ibid., pp. 166-67.

35. ibid.

36. ibid.


41. ibid., p. 297.

42. ibid.

43. Montalte, _La Basilique_, lacks pagination.

44. ibid.

45. ibid.


ibid., pp. 8-11, 17-29, 49, 60.


Some of his writing and drawings demonstrate an interest in Chartres cathedral and Cluny. In a letter to Ledeur he refers to Chartres as a precursor to Notre-Dame-du-Haut. Like Abbot Suger at St. Denis he placed an emphasis on the ceremonial door and on the metaphysical possibilities of light as an exhaltation of the pilgrims' movements. Le Corbusier, *l'art decoratif d'aujourd'hui*, p. 202; Le Corbusier to Ledeur, 25 April 1955, Fondation Le Corbusier, Paris.


Maissonier to Le Corbusier, 1 January 1951, Fondation Le Corbusier, Paris.


Le Corbusier, *The Chapel at Ronchamp*, p. 103.


CHAPTER IV


2. ibid., pp. 92, 99.
3. ibid., p. 99.
4. ibid.
5. ibid., pp. 91, 102.
6. idem, Le Livre de Ronchamp, pp. 131, 134.
7. ibid., pp. 102, 120.
8. ibid., p. 120.
9. idem, The Chapel at Ronchamp, p. 91.
10. ibid., p. 120.
18. Abbé Bourdin to Le Corbusier, 21 January 1952, Fondation Le Corbusier, Paris. Former problems experienced at the site were the absence of water, its susceptibility to lightning, and the prevelence of high winds from the north and southeast. Belot, Notre-Dame-du-Haut, pp. 32, 35, 40. Le Corbusier underlined these in his copy of Belot's book and the operable cistern and the partommeter on the south tower and perhaps the use of reinforced concrete resulted from consideration of these problems.
22. Samuely, "Concrete up to Date," p. 331.


27. ibid., pp. 531-53.


30. ibid.


37. idem, Le Corbusier 1910 - 1965, p. 70.


40. ibid., p. 137; idem, Oeuvre complète 1946 - 1952, pp. 15-17.


43. Le Corbusier, The Chapel at Ronchamp, p. 126.

44. ibid.

46. idem, Le Livre de Ronchamp, pp. 163-65.


48. Le Corbusier, Radiant City, p. 143; idem, Creation is a Patient Search, pp. 160-61.


50. ibid., pp. 36, 114, 135.

51. idem, Oeuvre complète 1946 - 1952, p. 117.


56. ibid.

57. "a hilltop chapel," p. 35.


59. Le Corbusier, Cathedrals, p. 3.


62. idem, The Chapel at Ronchamp, p. 88. Belot, Notre-Dame-du-Haut. Le Corbusier's underlinings are particularly insightful into possible conscious attempts to re-evaluate tradition.

63. idem, Oeuvre complète 1946 - 1952, p. 8.

64. idem, Le Livre de Ronchamp, pp. 122-23.

65. ibid.


68. idem, Le Corbusier 1910 - 1965, p. 255.


70. Le Corbusier, Le Livre de Ronchamp, p. 140.

71. idem, The Chapel at Ronchamp, pp. 89, 95, 117.

72. idem, New World of Space, p. 64.


75. ibid.

76. idem, New World of Space, p. 21.


78. idem, New World of Space, p. 21.

79. ibid., p. 8.

80. idem, Towards a new architecture, p. 19.

81. ibid., p. 17.

82. idem, Modulor 2, p. 253.


CHAPTER V


6. idem, Modulor 2, pp. 151-54.


8. ibid., Pope Pius XII, Mediator Dei, p. 64.

9. No acoustical demands other than audibility are evidenced in the letters or the literature published by the Church or the patrons.


11. ibid.

12. This is a simplified definition of the architect's role that has been derived from Doelle in Environmental Acoustics, pp. 3, 4, 12.


20. idem, New World of Space, p. 14; Le Corbusier et Pierre Jeanneret, Oeuvre complète 1929 - 1934, p. 24; Collins, Concrete, p. 249.


CHAPTER VI


9. Le Corbusier, Towards a new architecture, p. 64.


12. Mary Sekler, "Ruskin, The Tree and The Open Hand," ed. Walden, The Open Hand, pp. 61,62; Le Corbusier, Cathedrals, p. xviii, 3; Le Corbusier,


14. Le Corbusier, New World of Space, p. 20.


17. Le Corbusier, L'art décoratif d'aujourd'hui (Paris: Les Éditions G. Crès et cie, 1932), p. 120.


19. Ruskin, Lecture on Architecture and Painting, pp. 112-12; Kristine Offesen Garrigan, Ruskin On Architecture His Thought and Influence (Madison: The University of Wisconsin Press, 1973), pp. 29-61, 62; Owen Jones, Grammar of Ornament (London: Bernard Quaritch, 1910), pp. 1-2, 5-12; Benton, Benton and Sharp, Form and Function, pp. xxi-xxii; Zurko, Functionalist Theory, p. 7. Ruskin's descriptions in the Stones of Venice betray his greater concern for ornament and ornamental qualities than for structure, as does his Bible of Amiens. Le Corbusier read both of these and appears to have been much impressed with the underlying precepts expressed in them. Le Corbusier, L'art décoratif, pp. 123, 134-35.


25. Le Corbusier, Towards a new architecture, p. 64.

26. idem, L'art décoratif, pp. 81, 101, 120.

27. Le Corbusier, L'art décoratif, pp. 85, 96; idem, Radiant City, p. 151; idem, Towards a new architecture, p. 3-19.


29. idem, Towards a new architecture, pp. 13-20, 95-103.
30. ibid.


33. Sekler, "Ruskin," p. 76, figs. 20, 21, 22; p. 79, figs. 23, 24.

34. Le Corbusier, L'art decoratif, p. 83.


36. The effects of this trip are discussed by Turner, The Education of Le Corbusier, pp. 120-21. They are also evident in L'art decoratif, p. 96.

37. Le Corbusier, L'art decoratif, pp. 85, 122, 137, 144.


42. ibid.

43. Pope Pius XII, Mediator Dei, p. 63; O'Connell, Church Building, p. 30.

44. Turner, The Education of Le Corbusier, pp. 120-21; Le Corbusier, Towards a new architecture, pp. 72, 75, 153, 159.


52. *idem*, *The Chapel at Ronchamp*, p. 118.


55. *idem*, *Le Corbusier 1910 - 1965*, pp. 301, 305, 306, 309. By enlarging the expansion joints to create black, shadowed lines, Le Corbusier neatly encised forms similar to those found deftly encased in black lines in his painting.

56. *idem*, *Le Livre de Ronchamp*, pp. 71, 82.


63. *ibid.*, pp. 5-6.

64. *ibid.*, p. 6.


66. *ibid.*


70. ibid., p. 465.

71. ibid., p. 466.

72. ibid., p. 465.

73. The jewel is a motif often associated with the Virgin. Hirn, Sacred Shrine, p. 437. It is so used in Claudel's Annonce faite à Marie. A diamond shape is found painted on one northeast window.


75. Le Corbusier to Ferry, 8 April 1957, Fondation Le Corbusier, Paris.

76. Belot, Notre-Dame-du-Haut, pp. 4-5.


79. Le Corbusier, Le Corbusier 1910 - 1965, p. 89; idem, The Nursery Schools, trans. by Eleanor Levieux (New York: The Orion Press, 1968), pp. 41, 42. Nor should Le Corbusier's proposal to use coloured panes of glass in the reconstruction of the St. Die church be forgotten. see footnote 62, Chapter IV.


81. Couturier, Dieu et l'art, pp. 207-08, 209.


84. Le Corbusier, Cathedrals, pp. 102, 151, 165.


86. Rubin, Modern Sacred Art, p. facing 120.
87. Laurentin, Mary's Place, pp. 9-11.


89. Casanelles, Gaudi, pp. 97-103.


91. ibid.


93. idem, The Modulor, pp. 169; idem, Moduler 2, pp. 53, 55, 116, 150, 151, 157.

94. idem, Précisions, pp. 142-43.

95. idem, Oeuvre complète 1946 - 1952, p. 110.

96. Gauthier, Le Corbusier, pp. 87-88.

97. Le Corbusier, Précisions, p. 5.

98. idem, Radiant City, p. 15; idem, "Le Poème de l'angle droit." L'architecture du bonheur, lacks pagination.


101. Sekler, "Ruskin," p. 76, figs. 20, 21, 22.


105. idem, Cathedrals, p. 5; idem, Le Corbusier 1910 - 1965, p. 305.


107. idem, Towards a new architecture, p. 159.

108. idem, Cathedrals, pp. xviii, xix


111. idem, *Cathedrals*, pp. xviii, xix, 31, 146, 173, 176, 205.


113. idem, *Cathedrals*, p. xviii.


115. ibid.


120. Le Corbusier to Ferry, 8 Avril 1957, Fondation Le Corbusier, Paris.


125. idem, *The Chapel at Ronchamp*, p


127. idem, *Cathedrals*, p. 93.


129. The analogy between the Church edifice and the ark is common: it was often made to Notre-Dame-du-Haut. It was also used for Notre-Dame-du-Raincy. *American Architect* 126 (10 September 1924): 249-52.

130. Le Corbusier, *Cathedrals*, p. 93.


CHAPTER VII


3. Perret gives much greater emphasis to structure and materials than he does to light at Nôtre-Dame-du-Raincy in his comments about the church. Hammond gives much greater emphasis to the plan than to light. He attributes great symbolic value to the plan because he felt it indicated a response to new liturgical concerns. Hammond, Liturgy, pp. 83-90.

4. Le Corbusier, Radiant City, p. 47. The concern with siting and orientation for maximum sun penetration into interiors via a south exposure is a functional consideration found in the work of Alvar Aalto, and to a lesser extent in the work of B. Taut and Gropius, among others. The concern with maximizing natural interior illumination in the last decades of the nineteenth century and the first half of the twentieth century was prompted by commercial, economic, and health demands. This pragmatic (and programmatic) concern for light by Gropius, Aalto, and others differentiates it from Le Corbusier's approach to light at Notre-Dame-du-Haut. Paul Sheerbart is perhaps the most prominent twentieth-century architect concerned with the poetic and functional aspects of light. Yet he realized very little of his ideas.

5. Collins, Concrete, p. 243. However, this light scheme probably originated with Maurice Denice who was associated with the project.

6. Pichard, Eglises Nouvelles, p. 23, figs. 17-19; Schnell, Church Architecture in Germany, pp. 40-41, figs. 21, 26-29.


10. Rubin, Modern Sacred Art, fig. 51.

11. Sigfried Giedion, in Space, Time and Architecture, and Talbot


17. ibid.

18. ibid.


21. ibid.


33. These plans were furnished by the Fondation Le Corbusier, Paris.

34. Le Corbusier's sensitivity to both the horizontal and vertical movement of the sun is evidenced in his many diagrams showing the relationship between the sun's movement, latitude, and the resulting interior illumination. Le Corbusier and Pierre Jeanneret, *Oeuvre complète 1938 - 1946*, pp. 104, 106.


37. The other modifications include the decrease in the number of confessionals from three to one (with one more portable), the reorienting of the roof slope from the north to the west and the consequent relocation of the cistern in the west, and the changes made to the exterior exposed column in the east that became enclosed in a wall and made into an exterior sacristy.

38. For the importance of light in Le Corbusier's architectural theory see footnote 31 above. His projects for Algiers and Dr. Currett-chet's house at La Plata, Argentina show the extent to which he distorted facades in order to accommodate natural lighting objectives. Le Corbusier, *Oeuvre complète 1910 - 1965*, pp. 327, 82-85. The significance Le Corbusier attributed to light is exemplified in his *Radiant City*, p. 47. Light is given poetic form in his poem published in *The Chapel at Ronchamp*, p. 27. His spiritual response to light is exemplified in his *Voyage d'Orient*, pp. 66, 72, 76-79; *L'art décoratif d'aujourd'hui*, p. 198, and the 1907 chapel at La Chaux-de-Fonds. Sekler, "Ruskin," p. 58, fig. 17.


40. Le Corbusier, *Radiant City*, p. 86.

41. ibid., pp. 78, 85, 104.

42. ibid., p. 47.


45. This sign was used on numerous occasions and in several different contexts. Le Corbusier, Oeuvre complète 1946 - 1952, p. 149; idem, Cathedrals, pp. xviii, 171, 176; idem, Creation, p. 305.

46. Le Corbusier, Radiant City, p. 104.

47. Although Vers une architecture (1923) is most often characterised as a manifesto advocating technology and mechanization, references to light are also frequent. Statements supporting a technological viewpoint are balanced with statements advocating an architecture based on plastic emotion. It also contains his statement: "Architecture is the masterly, correct and magnificent play of masses brought together in light." Le Corbusier, Towards a new architecture, p. 29.


49. ibid., p. 64.


52. Le Corbusier, The Chapel at Ronchamp, p. 103.


54. Banham, Theory and Design, p. 217. North light is the light preferred by artists due to its general day-long consistency.

55. These can be seen reproduced in Le Livre de Ronchamp, pages 46 and 96. Although these may have been temporary lights added to enhance the photographs, Bollé-Reddat does state that some lights were added in 1956 and still more in 1968. Bollé-Reddat, Journal, 56:11.

56. This is exemplified by the concepts 'actio' and 'meditatio' used by Stoll in his book Ronchamp in reference to the Church and Notre-Dame-du-Haut, Ronchamp. Stoll, Ronchamp, p. 3. The idea that the Church should be both a place of celebration and of meditation appears in the writing of both Père Régamey, Père Couturier and Pope Pius XII's Mediator Dei, pp. 45, 46.


60. Rubin, Modern Sacred Art, pp. 62, 62. The idea of tension is very important to Le Corbusier philosophically and, as Notre-Dame-du-Haut demonstrates, architecturally. Le Corbusier felt that man lived in a state of tension with nature. He stated "man must struggle against nature to survive.... Happiness is not a reality, it is a fiction, it is a relation, a tension. It is a force drawing its energy from one thing - a thing that is in us, and therefore subject to change - and directed towards another which is a contingent and therefore likewise to change". Le Corbusier, Radiant City, p. 83.

61. Stoll, Ronchamp, figs. 15, 19, 35. In his next church project at Firminy, 1961, Le Corbusier indicated in his sketches that he intended to focus the sun's rays over the altar on Easter morning. In 1960 Le Corbusier showed an interest in the way in which 'the cosmic hours' were incorporated in church lighting schemes in the past. He mentions Santa Sophia, Constantinople and Stonehenge. Kidder-Smith, The creative method of Le Corbusier at Firminy (Harvard: M.I.T. Press, 1965). In 1961 Le Corbusier had referred back to his 1936 sketchbook which contained a sketch of the light effects of Santa Sophia. It may be that his renewed interest in Santa Sophia originated with Notre-Dame-du-Haut, Ronchamp, for there is a strong relationship between the 1936 sketch and the south wall at Ronchamp. Also Le Corbusier was in the process of reviewing his earlier sketchbooks at the time of the Ronchamp commission, as his recalling of Hadrian's villa demonstrates.


63. Le Corbusier, The Chapel at Ronchamp, p. 120.


65. Le Corbusier, Radiant City, pp. 28, 37; idem, Towards a new architecture, pp. 5-7, 16-17.


CHAPTER VIII

1. Le Corbusier, L'art décoratif d'aujourd'hui, p. 211.

2. ibid., p. 120.


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René-Jean. "L'Art et l'Église Pour une Renovation de l'art sacré." Le Monde 22 Juillet 1948


**UNPUBLISHED MATERIAL**

**Letters**


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