

** A Study on the Architectural Appropriateness to the Ceremony and Other Activities in Conjunction with the Change of Chronological Significance in A Cathedral

- With the Reference to the Liverpool Cathedral & the Metropolitan Cathedral in UK -
시대적 의미변화에 따른 성당의 예배의식과 의식 후 활동의 건축적 적합성에 관한 연구
- 영국 리버풀 교회와 메트로폴리탄 교회를 중심으로 -

문정목* / Moon, Jung-Mook

Abstract

성당은 인간의 세계와 신의 세계를 연결해주는 영역적 전환의 성격을 갖는 건축물이다. 그리고 이곳에서 벌어지는 찬송과 주문 등의 일련의 예배의식과정은 신의 영역으로의 전환을 위함이라고 할 수 있다. 전통적으로 성당에서의 예배는 성직자들의 의식 진행 과정이 신도들에게 잘 드러나지 않도록 배치되어왔다. 성직자와 일반신도는 철저히 구별되고 그 거리를 최대한으로 하는 건축계획이 이루어져왔는데 이것은 예배의 의식과정보다 신비스럽고 경외의 대상이 됨으로서 신권을 보다 확고히 하기 위한 의도로 풀이될 수 있다. 그러나 모더니즘의 탄생과 더불어 시작된 자유화는 사회의 각 분야를 변화시키고 성당에서도 예전의 신권 중심의 예배의식에서 벗어나, 보다 인간적인 의식으로의 전환이 정착되기에 이르렀다. 신도는 보다 적극적으로 예배의식에 참여할 수 있게 되고 예배 의식 이후에는 신도들의 인간적 교류를 증진하는 다양한 활동이 제공되었다.

이러한 상황 하에서 전통적 형태의 영국성당은 매우 성스럽고 예배를 위한 좋은 환경을 제공하고 있는데 비하여 모더니즘 이후의 성당은 현대 성당이 요구하는 예배 후의 다양한 활동을 수용한다는 생각이 지배적이었다. 본 연구는 이러한 일반적 견해에 대한 보다 과학적 분석 및 해석을 위하여 스페이스 신택스 기법을 사용하여 정량적 접근을 시도하였고 다양한 문헌고찰을 통하여 이에 대한 보다 면밀한 정성적 분석을 시도하였는데 그 결과 이에 대한 일반적 견해와는 반대로 전통적 형태의 성당이 예배후의 다양한 활동에 적합한데 비하여 현대적 형태의 성당은 예배의식에 보다 적합하다는 것으로 판명되었다.

키워드 : 리버풀교회, 메트로폴리탄교회, 예배의식, 스페이스신택스

Keywords : Liverpool Cathedral, Metropolitan Cathedral, Liturgy, Space Syntax

1. Introduction

1.1. Background and Purpose of the Study

It has been widely believed that the spatial organization of a building is related to its contents, such as activities of people, and the contents reflects its social institution. In the case of cathedrals, the spatial organization of interior spaces is associated with their many contents. In particular, it is related to the form of liturgy which is deployed differently according to the social background.

With the beginning of the Modernism, the liberalized social

environment required the modification of cathedrals, especially in terms of the liturgy. The sacred cathedral which asked for strict separation between laity and clergy during the liturgy was modified to accommodate the laity's active participation in the liturgy. After the liturgy, the sacred cathedral which did not accept informal activities, was changed to a human cathedral where people could communicate with each other. Now the cathedrals asked clear visibility between clergy and laity during the liturgy.

However, people in the cathedral during the worship still asked the church feel which the traditional form of cathedral normally has rather than the modern one does. Therefore, it is widely believed that in western countries, the traditional

* 정희원, 상명대학교 디자인대학 실내디자인전공 조교수, 공학박사

** 본 연구는 2006년 상명대학교 교내연구비 수혜로 수행 되었음.

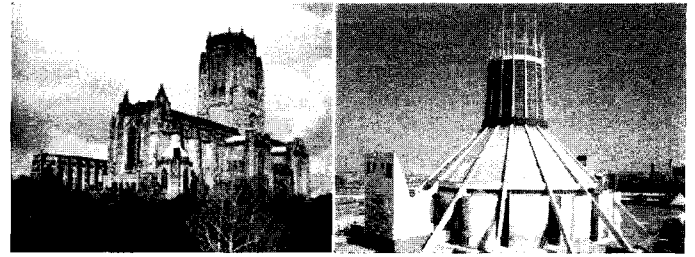
form of cathedral has a sacred and exclusive space while the modern form of cathedral has an informal and democratic one. Especially in the city of Liverpool, in which two different cathedrals in terms of architecture and chronology are, there has been an arguments about this.¹⁾

This study is to clarify if the traditional form of cathedral accommodates the ceremony well during the worship rather than the modern one does and if the modern cathedral is appropriate to the activities after the worship rather than the traditional one or not.

1.2. Methodology and Case of the Study

To do this, the morphological aspect of cathedrals will be investigated with the activities of people and social background. For the morphological analysis, the study introduced Space Syntax which is the mathematical approach to the space for the quantitative observation. Space Syntax is a kind of tool which represents and quantifies the syntactic elements in space and which analyses the spatial configuration through the represented and quantified syntactic elements of space. The complexly shaped and configured space is identified by a simple representation to be understood easily and calculated for the research. Then, the syntactic elements of space are revealed, representing the spatial configuration. Space Syntax has been developed by Bill Hillier and Julienne Hanson of Advanced Architectural Studies in the Bartlett School of Graduate Studies, University College London, since they established and launched the institution. The Space Syntax is also investigated with the analysis of the people's movement in pursuit of extraction of the behavior pattern from the proposed space. The results of the analysis will be interpreted with the form of the knowledge that the society provide.

For cases, two important cathedrals which are distinct from each other in terms of both appearance and background²⁾ will be introduced. Liverpool Cathedral³⁾<fig 1> is the traditional form of cathedral and Metropolitan Cathedral⁴⁾<fig 2>



<fig 1> Liverpool Cathedral

<fig 2> Metropolitan Cathedral

is the modern form of cathedral. These analysis is going to be performed with each cathedrals' worship and their other activities after the liturgy.

2. Main Body

2.1. Modification of Liturgical form in History

If religion is a kind of mirror on society, worship will be drawn on or, at least, be affected, by the social environment. With the beginning of Modernism, liberalization spread to every field, changing the nature of society. In the western church, liberalization modified the relationship between celebrant and congregation during worship. The strict separation between celebrant and congregation was changed to active participation by the congregation in the liturgy. These changes made the very sacred cathedral a more human place through which the congregation could actively participated in worship. The modification of the liturgy affected the spatial organization of the cathedral. The separation in the traditional form of liturgy appeared in the cathedral through a rood, a kind of translucent screen between the chancel and the nave in every medieval church.⁵⁾ As a result of this separation, the congregation in the nave could not clearly see the celebrant in the sanctuary. This poor visibility made the worship more mysterious and sacred for congregation. Therefore, the social distance between laity and clergy was extremely far and the cathedral design was based on the maximum possible distance between the sanctuary and the nave. The congregation's active participation in the modern form of liturgy made the celebrant beyond the screen come out of the sanctuary. G E Kidder Smith, in his book 'The New Church of Europe' stated that "a distinct tendency in today's

1)Institute for the study of worship and religious architecture in the University of Birmingham, The Multipurpose Church, the University of Birmingham, Birmingham, 1971, p.121

2)Edwin Smith & Olive Cook, British Church, Studio Vista, London, 1964, p.157

3)The Liverpool cathedral has finished the construction in 1900 since it started the construction in 1800.

4)The Metropolitan cathedral has completed the construction in 1900 since it started the construction in 1800.

5)Edwin Smith & Olive Cook, British Church, Studio Vista, London, 1964, p.125

churches pries the altar loose from the sanctuary wall and places it so that the priest or minister can stand behind and face the congregation during much of the service"⁶⁾ This means that the congregation not only see the ceremony clearly but also actively take part in it. Therefore, the social distance between laity and clergy has become minimized.

2.2. Essence of Liturgy

The cathedral is a kind of represented boundary between the human world and the divine one and it plays a mediating role between them. Through the physical cathedral, the abstract situation of meditating between two worlds is formed.⁷⁾

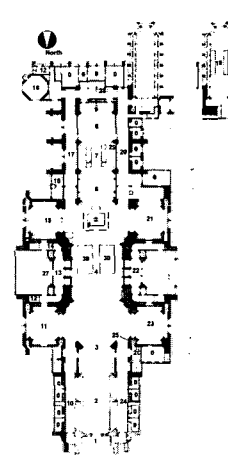
Since Aristotelian philosophy dominates the Western world, logic is common sense. However, in most religious doctrines with their ceremony, non-logical (mythological) things such as 'Almighty God' are often found, but people (at least, people who believe in God) do not think that it is beyond common sense. Instead, they take it for granted. The mediating bridge (the cathedral) as a non-logical metaphoric reality, is between the human world (logic) and the divine one which we assume is non-logical (mythological)⁸⁾. The idea of non-logic (mythologic) and logic can be applied to the situations of during worship and after worship. During worship, the activities of people are compelled by non-logical(mythological) liturgy, therefore People have to follow the programmed liturgy and the movement is dominated by knowledge. However, after worship, people are not compelled by liturgy any more. They can move around freely without restriction. Therefore, the logic and non-logic (mythologic) appear in the pattern of movement as well as in its doctrine.

As Levi-Strauss stated, "there is a common theme between the myth and the musical work: both of them are like conducting an orchestra whose audience becomes the silent performer. During the worship of myth or performing of music, they try to suppress time and space to reach other, and the performer and observer are often the same people".⁹⁾ Both performing and observing during the ritual

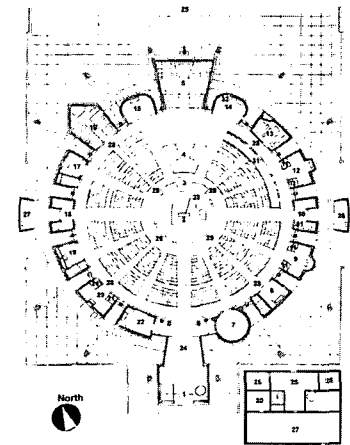
are included in the worship. They need to be seen as well as to see. G E Kidder Smith stated in his book, *The New Church of Europe* "The main purpose of liturgical movement is to set up the closer relationship between priest and congregation and to make the congregation participate in the liturgy, not just observe as a solitary individual to experience the worship".¹⁰⁾ So, clear visibility and layout, which make concentration possible, are essential for active participation in the ritual. These are for a new form of liturgy after Modernism and therefore clear visibility and concentrated layout are important to evaluate the quality of the worship in this study.

2.3. Cathedral during Worship

(1) Relationship between Worship and Visibility



<fig 3> plan, Liverpool Cathedral



<fig 4> plan, Metropolitan Cathedral

room	L	M	room	L	M	room	L	M
entry	1	1	bookshop		22	high alter	9	2
confessional		14,22	baptistry	21	7	nave alter	5	
bishop's chair	6	3	nave	2		choir	7	4
visitor's center	3		refectory	27		derby memorial	21	
central space	4		war memorial chapel	15		chapel house	18	
			chapter houadse	18		Lady Chapel		16

The primary program of any cathedral is worship and it is with this in mind that cathedrals are normally designed. Since modern form of liturgy was established, worship has

6)G E Kidder Smith, *The New Church of Europe*, The Architectural Press, London, 1964, p.12

7)Edmund Leach, *Culture & Communication*, Cambridge University Press, Cambridge, 1976, pp.33-35

8)Edmund Leach, *Culture & Communication*, Cambridge University Press, Cambridge, 1976, pp.33-35 & pp.69-71

9)C Levi-Strauss, *The Raw and Cooked*. trans. J and D Weightman, Jonathan Cape, London, 1970, p.17

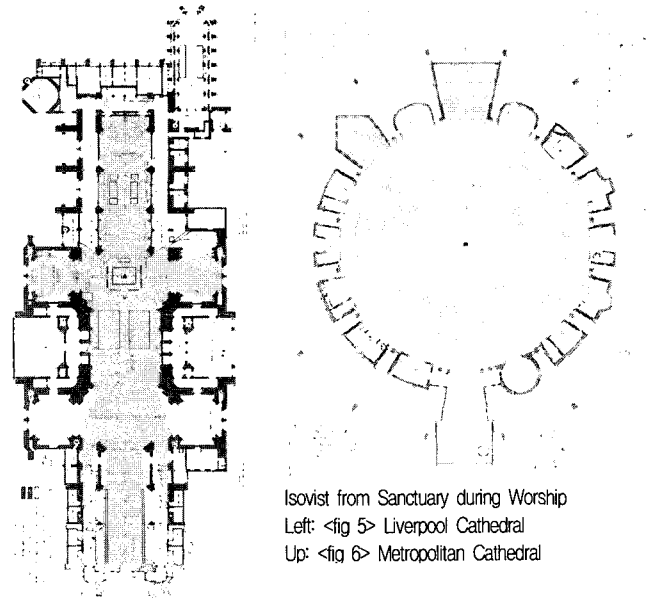
10)G E Kidder Smith, *The New Church of Europe*, The Architectural Press, London, 1964, p.11

been a combination of the performance and observations of priests and congregation during the ceremony. The meaning of liturgy comes out of a combination of all the performing and observing, not from each individual performance and observation. Through the liturgy, the participants can suppress their normal time and space to reach the other space and time in which God exists.¹¹⁾

The main purpose of liturgical movement is to set up a closer relationship between priest and congregation and to make the congregation participate in the liturgy: not just to observe as solitary individuals, but to actually experience the worship. A closer relationship between priest and congregation affects the whole design of a cathedral.¹²⁾ G E Kidder Smith stated in his book, 'The New Church of Europe' that "The Choir, many of who are concerned with the church feel, should never be placed as an intruders between the altar and congregation. A Choir distracts-if pretty-and always makes more remote the sanctuary itself. Moreover, the famous-infamous divided choir constitutes an affront to the conductor. The rear gallery is more and more the favoured location for choir and organ".¹³⁾

The importance of visibility during worship lies at this point. People who attend the worship need to see what the priest is performing and the priest should control the people's performing.

The enclosed plan of Liverpool Cathedral allows people in the chapels (the Lady Chapel, the Chapel House and the Chapel of the Holy Spirit) to avoid interruption by the tourists because they are physically isolated and independent and visually inaccessible.<fig 3> However, at large-scale services, the enclosed spaces with their complex ceilings create visual interruption, which decreases the quality of service, during service and it is impossible to perceive the whole cathedral and its events simultaneously. For example, at the John Moore University Graduation Ceremony Service, some people in the North-West Transept (Derby Memorial) cannot see some of the clergy in the Choir stall nor the Choir or the congregation in the Central Space.<fig 8>



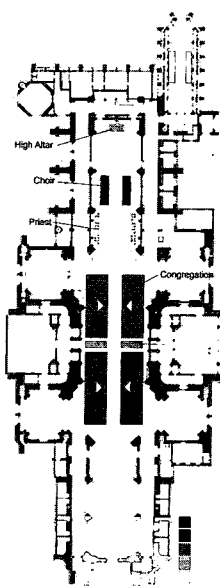
Isovist from Sanctuary during Worship
Left: <fig 5> Liverpool Cathedral
Up: <fig 6> Metropolitan Cathedral

One of the reasons why the Nave Altar in the Central Space is used instead of the High Altar during the Sung Eucharist, which is the most important Sunday service at 10:30 am, is the better visibility gained through its use. As the isovist indicates, the location of the Nave Altar gives the largest visual field <fig 5>. In most services and other events, the layout in the cathedral is arranged to avoid visual interference. This is achieved by changing the location of the Bishops Chair, Choir, High Altar, clergy's chair and even the pews for the congregation. However, despite this efforts, no arrangement is sufficient to provide good visibility. For example, during Sung Eucharist at 10:30 am, Sunday, some people in the congregation cannot see the Bishop and during the Choral Evensong in the Chancel, the people who attend have some visual difficulty seeing the clergy and Choir who are located at the side of the people. This became clear during the interview with Canon Noel T Vincent in Liverpool Cathedral. He stated that "The structure of the building often interrupts the visibility of both the congregation of the cathedral, and priests. Thus, it is not easy for everyone to see what is happening, even if the building has an uninterrupted view from the West end to the East end". Clearly, then, the cathedral has visual weaknesses. However, the cathedral has tried hard to minimize these by adopting movable layouts for services.

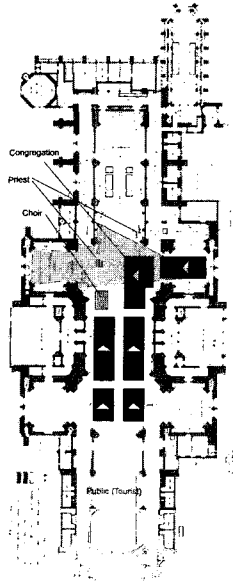
11) Edmund Leach, Culture & Communication, Cambridge University Press, Cambridge, 1976, pp.44-45

12) G E Kidder Smith, The New Church of Europe, The Architectural Press, 1964, p.11

13) G E Kidder Smith, The New Church of Europe, The Architectural Press, 1964, p.12



<fig 7> Collegiate Style Service



<fig 8> John Moore Univ Graduation Service

On the other hand, Metropolitan Cathedral has an open plan and a simply changing ceiling. There is no visual interruption at all in the whole cathedral, giving a simultaneous perception of the whole space and its events.<fig 4> As the isovist shows the High Altar has the largest visual field in this cathedral<fig 5>, as the Nave Altar has in Liverpool Cathedral. One of the reasons why the layout of the furniture has not been changed is that cathedral and its layout are visually ideal for mass. In the interview with Canon Peter Cookson, he stated that "Everything is under control during the mass, because of the visibility".

The side chapels are composed of one convex space, so there is no visual interruption here either. However, the downside to this is that chapels (the Blessed Sacrament Chapel, the Lady Chapel and the Side Chapels) are expected to be interrupted visually and even physically by tourists (except St. Columba Chapel), because they are not isolated and independent. Therefore, as Canon Peter Cookson stated in the interview that the tourists had to be quiet not to interrupt the prayer and sometimes they are restricted to enter whole cathedral except for Lobby and Visitor's Centre.

(2) Relationship between Worship and Layout

The layout of furniture as pews for the congregation and chairs for the clergy, and its relationship to the location of the Sanctuary, are important for evaluating the quality of

space for worship in modern form of liturgy. If the layout makes people concentrate on the sanctuary, a worship without interference or diffuseness is expected. On the contrary, if the layout makes peoples concentration scattered by turning their seats in different directions, interruption is expected during worship.

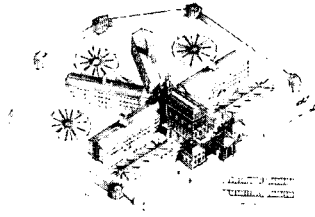
In Liverpool Cathedral, the layout of pews and the clergy's chairs during large-scale services is multi-directional and the foci of each group of people are different, except for Sung Eucharist at 10:30 am and some prayers in the chapels. At the Choral Evensong¹⁴⁾ and Collegiate style Service<fig 7>, people in the congregation split symmetrically and face each other. The members of the Choir and the clergy sit in the same way. Therefore, it is difficult to concentrate on one point. Instead, they simply face each other. At John Moore University Graduation Ceremony Service, the layout of seats provides totally different foci for the people<fig 8>. So, the quality of service is expected to have lost something from the layout

In the case of Metropolitan Cathedral, the radial layout allows the congregation and priests to concentrate on the Sanctuary. The priests who need to control the worship can easily observe the whole liturgy and the congregation<fig 6>. One of the merits of this radial organization of space is the ability to control. Thomas A. Markus states in his book 'Building & Power'¹⁵⁾ that in prisons or lunatic asylums, which require proper surveillance facilities, radial organization of space was often used to watch and control prisoners and patients in the 18th and 19th centuries<fig 9 & 10>. In schools too, the radial organization of space plays a strong role in control. As Jeremy Bentham stated "the sentiment of the invisible omniscience · The principle of central and complete inspection, which a simple architectural contrivance affords, has been proved so wonderfully to augment the powers of superintendence, that it can not fail materially to improve the influence of the teacher in a seminary of instruction, 1816".¹⁶⁾ In Metropolitan Cathedral, as Canon Peter Cookson stated, everything is under control during mass and people do not have any problem seeing the worship, concentrating on the sanctuary.

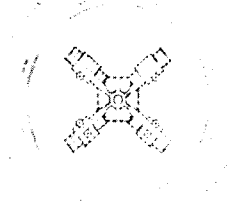
14)A prayer which is held in Chancel at 3:00 pm on Saturday & Sunday, and at 5:30 pm On weekdays

15)Thomas A. Markus, Building & Power', Routledge, London, 1993

16)Thomas Markus, Building and Power, Routledge, London, 1993, p.68

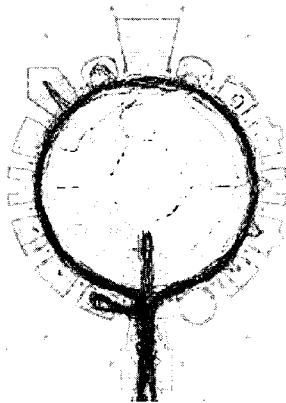
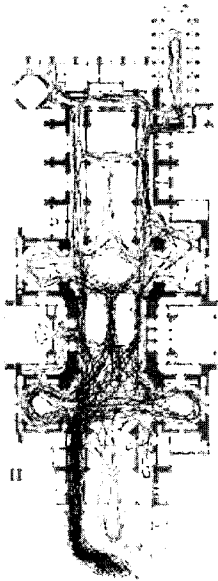


<fig 9> Pentonville Prison

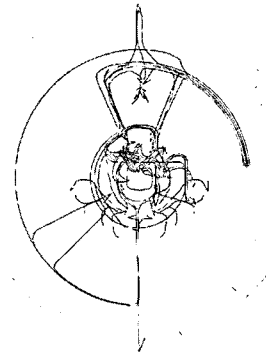
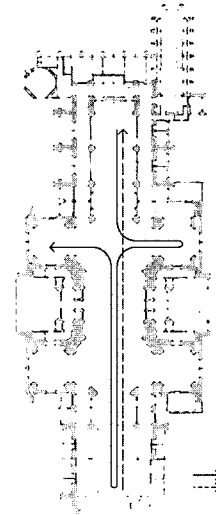


<fig 10> Glasgow Lunatic Asylum

(3) Relationship between Worship and Flexibility



Torist Following after Worship
Left: <fig 11> Liverpool Cathedral
Up:<fig 12> Metropolitan Cathedral



Movement during Worship
Left:<fig 13> Liverpool Cathedral
Up:<fig 14> Metropolitan Cathedral

In Liverpool Cathedral, flexibility was inevitable, because all arrangements in the cathedral were temporary before full completion, which took 74 years. Since construction first began, the space for worship has been changed to make full use of the completed part of the cathedral building. This means that throughout the construction period, it was attempted to get the maximum visibility possible within the partly finished enclosed building. Thus, it is the visibility that seem to have made the flexibility possible.

In Metropolitan Cathedral, basically, the cathedral building was designed to create the maximum possible quality of visibility and there was no need for temporary arrangements because the construction period was just 5 years. There was no other way to increase the visibility within the radial layout of cathedral, as this was the best condition for the mass. Canon Peter Cookson stated that "the initial design sought to have half of the pews movable to accommodate other activities or different forms of mass, but there is no space to store the pews and it consumes a great deal of

time and money to take them out. So, while the arrangement is the best condition for worship but there is no alternative way to arrange the interior". This means that the full visibility of the cathedral makes the pews being fixed.

Therefore, in Liverpool Cathedral, they have to rearrange the cathedral all the time, to avoid visibility problems. In Metropolitan Cathedral, they don't need to rearrange the cathedral, having maximum quality visibility.

2.4. Cathedral after Worship

(1) Cathedral for Other Activities that Modern Cathedral Requires

Accommodating activities other than worship in cathedral is a requirement of the modern religious building. Through other activities, people can communicate with each other, being raising as a Christian.

This is well described in 'The Multipurpose Church'¹⁷⁾, which stated "The church is to be understood in relation to the mission of God. We may say that God is concerned to bring all men into unity with himself and with one another. We may say that God is concerned to make men fully human, so that to join in mission is to be contagiously human heir life must produce the pattern of the life of Christ, the form of servant he church therefore is to be a servant community. It will not define the function of the building in simply self regarding terms, i.e. to provide for its acts of worship, its ecclesiastical organizations; it will include making provision for the human need of the neighbourhood."¹⁸⁾

17)Institute for the study of worship and religious architecture in the University of Birmingham, The Multipurpose Church, the University of Birmingham, Birmingham

18)Institute for the study of worship and religious architecture in the

In Liverpool Cathedral, although the organization is enclosed, the building is frequently used for other activities such as music concerts, dance performances, theatrical plays, exhibitions and even rock festivals. On the other hand, in Metropolitan Cathedral, the cathedral building is mainly used for the mass held on Sunday at 10:30 am, in spite of its open organization. Instead, the Crypt which is below the Cathedral is normally used for other activities. One of the reasons is, of course, that the Liverpool Cathedral has a movable layout, while Metropolitan Cathedral has a fixed one. However, the important thing is that the plans of both Liverpool Cathedral and the Crypt of Metropolitan Cathedral are enclosed. Through these cathedrals, questions are raised about the application of the universal space of Modern Architecture to Metropolitan Cathedral. Whatever Sir Frederick Gibberons¹⁹⁾ intention was, a multi-programme church is a general requirement of religious buildings nowadays. His huge cathedral is used regularly only for Sunday mass for 1 hour per week. The problem of openness is that because it is vacant and open, it is difficult for a certain programme or activity to be defined. In other words, a programme or activity needs an enclosed space to be set up. In case the programme is not proper for the space, the programme should be adjusted, and then unexpected and diverse events can appear. This is what Liverpool Cathedral has tried with flexibility since its construction began.

The organization of Liverpool Cathedral is multi-axial, making the rectangular shape of spatial use inevitable. In the case of Metropolitan Cathedral, due to the circular and radial organization, a radial-shaped space is used. Since human artifacts were first created, the rectangular shape has been more familiar and useful to people than any amorphous form. As this study has already stated, the radial form is useful for some specific functions such as surveillance or concentration, but it is not proper for other multiple uses. This is another possible reason for the accommodation of other activities in Liverpool Cathedral and Crypt of Metropolitan Cathedral.

(2) Cathedral and Events

In Liverpool Cathedral, the results of Tourist Following<fig 11> show that there is no regularity in

tourists' movements. In the case of Metropolitan Cathedral, the circular organization seems to affect people's movement. Most people simply turn round the Sanctuary along the Outer Corridor as a circle.<fig 12>.

There are private spaces, such as the vestry on the same floor as the cathedral in Liverpool Cathedral while in Metropolitan Cathedral, the private space of the sacristy is on a different floor. The Refectory is also on the same floor as the cathedral and the Visitors' Centre is almost in the middle of the whole building in Liverpool Cathedral, while in Metropolitan Cathedral, the Refectory is on the ground floor and the Visitors Centre is connected to the Lobby which is next to the main entrance. For Liverpool Cathedral, the private is mixed with the public and people of different purposes are mixed while for Metropolitan Cathedral, the private is not mixed with the public, and people who have different purposes are not mixed with each other. The movable layout creates diversity in other activities in Liverpool Cathedral while the fixed layout provides simple and fixed activities after mass. The intelligibility²⁰⁾ of Liverpool Cathedral is less than that of Metropolitan Cathedral. This means that way finding in Liverpool Cathedral is more difficult and a more complex situation is expected than in Metropolitan Cathedral.

All of these facts explain that there is an unexpected complex situation in Liverpool Cathedral, while, expected simple situation in Metropolitan Cathedral, after worship. Liverpool Cathedral's complex situation is thought through the mixing of the private with the public and facing people who have different purposes. The lack of regularity in the Tourist Following, the flexible layout and low intelligibility (r-sq value) also indicate unexpected complexity in Liverpool Cathedral<table 1>. Metropolitan Cathedral's simple situation is thought through the separation of the private and the public, and among people who have different purposes. A certain regularity in the Tourist Following, and the fixed layout and high intelligibility (r-sq value) also indicates something expected in Metropolitan Cathedral<table 1>.

To explain the complex situation, the concept of event will be introduced. The event according to Andrew Benjamin's definition, is "not a simple occurrence, nor is it just that which happens. It is the event that occasions what will have

University of Birmingham, The Multipurpose Church, the University of Birmingham, Birmingham, 1971, pp.6-7
19)architect who designed the Metropolitan Cathedral

20)intelligibility is calculated with r-sq value and defined that well intelligible space is well connected space with well integrated space.

occurred. An event is the unforeseen chance or possibility in a history of another history".²¹⁾ The daily and normal happening is not the event. Instead, the event is something new and unexpected. For space, the event is a kind of possibility to experience the new which is dynamically perceived through time. For Liverpool Cathedral, the experience is arbitrary but has the possibility to meet diversity, while in Metropolitan Cathedral, the experience is simple and there is little possibility of meeting the new, just turning round the Sanctuary along the Outer Corridor. Throughout these spatial experiences, people in Liverpool Cathedral meet new situations and encounter more dramatic activities after the service while people in Metropolitan Cathedral meet a similar situation to what they experienced before.

<table 1> New Wave result: public space alone (whole space)

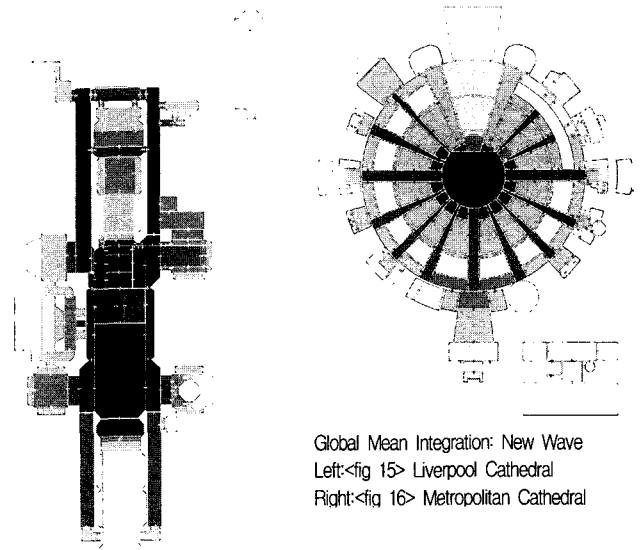
	Liverpool Cathedral	Metropolitan Cathedral
Global Mean Integration	0.734 (0.813)	1.305 (1.312)
Intelligibility (r-square)	0.250 (0.194)	0.374 (0.365)

2.5. Discussion

In a building with strong programme, as Bill Hillier stated in his book, 'Space is the Machine',²²⁾ movement of people is programmed in advanced of syntactic property, aiming to arrange the indispensable occurrence.²³⁾ Cathedral is widely believed to be a strong programme by which movement of people is controlled, not by syntactic property. Therefore, the application of the space syntax tool to the cathedral building during worship seems not to be proper. This is because it is expected that people's movement and space use are determined by the liturgy, not by the syntactic property of the building. That is, the non-logical (mythological) condition of the liturgy requires non-logical space use and people movement during worship. People who attend worship are constrained to keep seated, and they sometimes have to stand up to sing a hymn or to recite the Lord's Prayer and go to the sanctuary to participate in the Bread and Wine ritual during the service. In the case of priests, they show a

certain mode of movement according to their own programme during the worship. Tourists are restricted in their movement around the cathedral during worship.

However, it does seem possible to apply space syntax tool to the cathedral building after worship, because then the cathedral building is expected to be a normal building and the syntactic property expects people movement after the worship. The logical condition of the syntactic property of the cathedral after worship is anticipated to affect people movement and space use. After worship, people who have just finished the liturgy move around freely to greet other people and to enjoy interesting features such as exhibitions, flowers and sculptures. going to the Refectory or Visitors Centre to buy books. Tourists go to the interesting places without restriction. This is the normal pattern of movement and there seem to be no constraints.



If they are applied equally to Liverpool Cathedral and Metropolitan Cathedral, the same things are happened.

During worship, the Sanctuary with the High Altar should be the most important and concentrated space because it is the centre of worship and most of priest's movement as part of the liturgy occurs in the Sanctuary. According to the observation of <fig 13 & 14>, people movement in both cathedrals during worship was found around the Sanctuary. However, as the syntactic property <New Wave: fig 15 & 16> of both cathedrals indicates, the most integrated space for Metropolitan Cathedral is the Sanctuary with High Altar, while for Liverpool Cathedral, it is the north part of the Central Space (behind the layer of pews). So it could be said that the expectation of the most integrated space in

21) Andrew Benjamin, Event, Time, Repetition, Columbia Document of Architecture and Theory, Vol4, Columbia University Press, New York, 1995, pp.139-156

22) Bill Hillier, Space is the Machine, Cambridge University Press, Cambridge, 1995

23) Bill Hillier, Space is the Machine, Cambridge University Press, Cambridge, 1995, p.252

Metropolitan Cathedral is correct and space syntax tool seems to work during worship, while that of Liverpool Cathedral is not correct and the space syntax tool seems not to work. The interesting thing is that, the segregated High Altar <south of the chancel fig 3 no.9> of Liverpool Cathedral is not used and instead the more integrated Nave Altar <south part of the Central Space fig 3 no.5> is used, during the important service, Sung Eucharist at 10:30 am. This indicates that the altar is the most important and concentrated space during worship and both cathedrals want the altar to be integrated and concentrated at this time.

The logic, the opposite concept of the non-logic (mytho-logic) can be applied to the cathedral after worship. There seems to be no constraint on use of space and people movement after worship. People who have finished worship move around freely, greeting and communicating with each other. Tourists can go anywhere they want, except for the private spaces. The Visitor's centre and the Refectory of both cathedrals become busy.

The expectation of people movement through the syntactic property of the cathedral works in reverse at this time. In the case of Metropolitan Cathedral, the most integrated space, the Sanctuary, is no longer used. Nobody dares to enter the Sanctuary. However, the Outer Corridor, which is more or less segregated, comes to be frequently used. Many people who have attended the mass, and most of the tourists, turn round the cathedral along the Outer Corridor, enjoying the sculptures, flowers and side chapels of the cathedral. This Outer Corridor becomes a place for communication among people who have attended the mass and the priests. Thus, the application of the space syntax tool to Metropolitan Cathedral has no meaning after mass. On the other hand, in Liverpool Cathedral, the expectation of people movement through the Space Syntax tool accords with the real use of the cathedral (observation result fig11,17). People stay in the north part of the Central Space after the service and it is the most frequently used space, as the syntactic property expected. Therefore, the Space Syntax tool (New Wave) works in Liverpool Cathedral in terms of the most integrated space.

Bill Hillier mentioned this matter in his recent book.²⁴⁾ What he said in his book is about the difference between

the city which is understood and calculated through the syntactic property and the city which is not understood and calculated through the syntactic property. He pointed out that the former is a city for social production, such as 'producing, distributing and exchanging the goods' and the syntactic property is instrumental. The latter is a city for social reproduction, such as 'governing institution, regulating bureaucracy and dominant ceremonial form' and the syntactic property is symbolic. In most cases, the city with an instrumental syntactic property is for the common people and evolves naturally, while the city with a symbolic syntactic property is for peculiar people and evolves artificially. An example of an instrumental city is the City of London while an example of a symbolic city is Brasilia. In the City of London, the city has evolved naturally and its form is arbitrary. The city is actually for social production and the syntactic property is instrumental. In contrast, Brasilia has been artificially developed and the city form is geometric. The city is for social reproduction and the syntactic property is symbolic.²⁵⁾

If this idea is applied to small-scale buildings, then Liverpool Cathedral is an instrumental building while Metropolitan Cathedral is a symbolic one. For Liverpool Cathedral, the expectation of people movement through the syntactic property of the cathedral building accords with the observation result of the cathedral building after worship and the building was constructed over a period of 74 years. During this time, the arrangement of furniture was changed to accord with the completed part of the building and form of liturgy was changed from separation to participation, by replacing High Altar to Nave Altar. In addition, Canon Noel T Vincent stated in the interview that "the ritual has developed to make use of the building in various ways to enrich the spiritual experience as well as to keep the worship fresh". This is all about the spatial evolution of the cathedral. Thus, Liverpool Cathedral is instrumental: it is for the common people, and social production (interchange in community and mission through tourism) is expected to be there, after worship.

For Metropolitan Cathedral, first, the ritual environment is ideal but people movement cannot be traced through the syntactic property of the cathedral building after mass.

24) Bill Hillier, *Space is the Machine*, Cambridge University Press, Cambridge, 1996

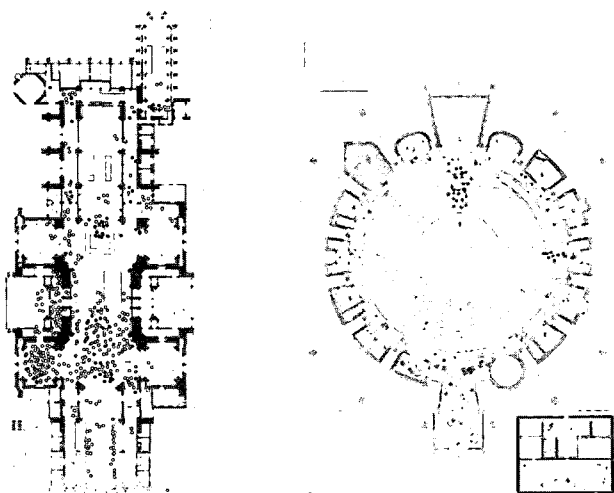
25) Bill Hillier, *Space is the Machine*, Cambridge University Press, Cambridge, 1996, pp.215-232

Furthermore, because the construction period was just 5 years, evolution cannot be expected and it is closer to an artificial thing than a natural thing. Therefore, the building is symbolic.

3. Conclusion

The informal activities after worship and the formal liturgy during worship are equally important for a cathedral. Nowadays, for collectively, they comprise the events of the cathedral.

The general idea which is prevalent in the Europe's cities,



Static People Snapshot after worship
 Left: <fig 17> Liverpool Cathedral
 Right: <fig 18> Metropolitan Cathedral

especially in the city of Liverpool is that: 1. The sacred Liverpool Cathedral is expected to be formal. In addition, it has an exclusively religious environment so that protection and separation are anticipated. Therefore, the traditional form of cathedral is ideal for worship but it is not ideal for the informal activities after worship, that a modern cathedral requires. 2. The sophisticated Metropolitan Cathedral is expected to be informal. In addition, it has a democratic religious environment so that the attraction and participation is anticipated. Therefore, the modern form of cathedral is suitable for informal activities but it is not enough to have consecrated worship.

However, the ideas turned out to be in reverse. Therefore, this study conclude that:

1. The traditional form of cathedral is so instrumental that the space is good for the informal activities that a modern cathedral requires and the modern form of cathedral is so

symbolic that the space is good for the formal liturgy. During worship, movement of people was dominated by the liturgy, not by the syntactic property in Liverpool Cathedral but in Metropolitan Cathedral it was the reverse. However, after worship, movement of people is dominated by the syntactic property in Liverpool Cathedral but in Metropolitan Cathedral it is not. As Bill Hillier suggested, Liverpool Cathedral is an instrumental building for other activities while Metropolitan Cathedral is a symbolic one for worship.

2. The traditional form of cathedral is not as useful for worship in the modern form of the liturgy, as the modern cathedral does. The visual interference in Liverpool Cathedral due to the enclosed organization during services indicates that the cathedral is not ideal for this purpose, while the visual clearness in Metropolitan Cathedral due to its open organization makes it ideal for mass. Because, the clear visibility is an essential thing for performance and observation, among communication methods.

For the layout of furniture during worship, Metropolitan Cathedral's radial organization is more appropriate for mass than Liverpool Cathedral's multi directional one. Because, in the former, concentration of foci is expected while in the latter, scattering of foci is inevitable. In addition, movement of people during worship occurs around the sanctuary which is the most important space.

Liverpool's flexible layout enables people to have a diverse spatial experience during the services. In contrast, in Metropolitan Cathedral, it is impossible to have a diverse spatial experience.

3. After worship, the modern form of cathedral is not useful for the other activities, than traditional form of cathedral. The enclosed rectangular organization of Liverpool Cathedral, contrary to the general idea for this, turned out to be more suitable for the other activities that a modern cathedral requires than the open radial organization of Metropolitan Cathedral. This is because the enclosed rectangular space is more suited to set up a certain program and more useful for the human artefacts, whether physical or abstract, than a vacant radial space. The comparatively irregular movement of people and the flexible layout in Liverpool Cathedral indicates unintelligible space use but it means a possibility of unexpected situation, while the comparatively regular one in Metropolitan Cathedral indicates intelligible spatial use but it is an expected situation, after

worship. Therefore, the traditional form of Liverpool Cathedral is a place of diversity which other activities requires, while the modern form of the Metropolitan Cathedral is a place of constraint which is not suitable for other activities. The traditional form of cathedral which had been strongly expected to be sacred and formal, turned out to be sophisticated and informal, while the modern form of cathedral which had been broadly thought to be sophisticated and informal proved to be sacred and formal.

Bibliography

1. Andrew Benjamin, Event, Time, Repetition, Columbia Document of Architecture and Theory, Vol4, Columbia Univ. Press, New York, 1995
2. Owen Chadwick, The Reformation, Penguin Books, London, 1964
3. Robert Audi, The Cambridge Dictionary of Philosophy, Cambridge Univ. Press, Cambridge, 1995
4. David Cole, The Work of Sir Gilbert Scott, The Architectural Press, London, 1980
5. G.H. Cook, The English Cathedral through the century, Phoenix House LTD, London, 1957
6. Vere E. Cotton, O.B.E. The Liverpool Cathedral Official Handbook, Little Bros. Liverpool, 1927
7. C Levi-Strauss, The Raw and the Cooked, trans. J and D Weightman, Jonathan Cape, London, 1970
8. Liverpool Cathedral (Canon Noel Vincent), Liverpool Cathedral (guide book), Pitkin Guide Ltd. Liverpool, 1997
9. J Fleming, H Honour & N Pevsmer, The Penguin Dictionary of Architecture, Penguin Books, London, 1966
10. Bill Hillier, Space is the Machine, Cambridge Univ. Press, Cambridge, 1996
11. Bill Hillier & Julienne Hanson, The Social Logic of Space, Cambridge Univ. Press, Cambridge, 1984
12. Institute for the study of worship and religious architecture in the University of Birmingham, The Multipurpose Church, the University of Birmingham, Birmingham, 1971
13. Edmund Leach, Culture and Communication, Cambridge Univ. Press, Cambridge, 1976
14. Thomas Markus, Building & Power, Routledge, London, 1993
15. Metropolitan Cathedral, Metropolitan Cathedral of Christ the King, Liverpool (guide book), Bessacar Prints, Doncaster, 1990
16. J. O'Connell, Church Building and Furnishing: The Churches Law, Burns & Oates, London, 1955
17. Edwin Smith & Olive Cook, British Church, Studio Vista, London, 1964 Peter Kennerley. The Building of Liverpool Cathedral, Carnegie Publishing, Lancashire, 1991
18. P Thirty, R Bennett & H Kamphoefner, Church & Temple, Reinhold Publishing Corporation, 1953

<접수 : 2007. 2. 8.>