Concepts began to come easy after doing the research and exercises on hospital design. I realized that hospital design was a complexity of departments, functions, and users. Separation and control of interplay of these parts was realized at the beginning. Doing the sketches on relationships of spaces gave me the foundation to start from, also in programming the separation of functions help me to add to that foundation.

Three main ideas came up from studying other works of how to relate patient to services. These are:

1) Base and Tower (vertical)
2) Base and Base (horizontal)
3) Combination

Studying the site gave me a clue of what to choose in the basic organization concept. The nice views made me realize to choose the vertical concept, but the vast amount of space allowed on site suggested horizontally. The combination looked good.

In keeping the combination in mind I sat down to organize what needed to be. I realized that such services as emergency, radiology, outpatient, receiving, trash, psychiatric, and admitting needed to be on ground floor. Services such as surgery and delivery needed to be near the nurse units of intensive care and obstetrics. The other nurse units such as medical,
surgical, and pediatrics good make up a vertical element of the hospital. Understanding many options of organizational possibilities I needed to set on order to this complexity.

I felt the best place to start was with the patient. He is the customer of the facility. I started to study the room and the nurse pod. I found that the most efficient geometry for a nurse pod was the triangle. Within the triangle the patients' room could make up the perimeter. The nurse services would become the central core of the pod. This would allow shorter distances for the nurse to travel to the furthest room away and also psychologically the patient would feel secure if he would need a nurses' service.

In the patients room I tried to deal with such issues as privacy, encouragement to get out of the room, and views outside the hospital. I felt each patient should have his or her own window, and privacy by manipulating the geometry of the room. I tried to encourage the patient to explore the surroundings outside the room. I felt playing with ins and outs within the corridor allowed the patient to stop and have a conversation with another patient. The main item of interest to the patient was a lounge of green plants and good views that were different from his room.

From establishing these ideas of order within the patient pod, I established a grid system based on the size
of the patients' room. Bays ended up being 3½ feet from center to center, allowing 2 feet for the structural system and mechanical ductwork. This structural system was established throughout the hospital.

On the ground floor circulation control was going to be the key. Following the triangle I had three functions to control.

1) visitors flow and inpatient admissions.
2) service flow and housekeeping
3) ancillary flow and doctors.

Using three sets of elevator systems in each area allowed separation of these traffic flows and only allowing interaction when interaction needed to happen.

The main concept I wanted the hospital to express was a sense of community involvement. I wanted the hospital to open up to the community physically. I felt a glass atrium on the south side of the hospital filled with greenery might do the trick in the surrounding nature and opened up the hospital to the public.

Education was also a main concern. Allowing areas adjacent to the atrium area that would have lectures and seminars on health care. The following illustrations will hopefully make a point of the concepts that will generate a final design.
CONCEPTS

PLAN

HOSPITAL SPECIAL PROCEDURES
(PRIVATE)

PRE-HOSPITAL
(PUBLIC)

MAJOR ENTRY

GRID BASED ON NURSE POD SYSTEM (TRIANGLE)

ELEVATION

SERVICE CORE

ENTRY

PUBLIC

PRIVATE

MECHANICAL

NURSE STATION'S

ANCILLARY SERVICE

MECHANICAL FLOOR SEPARATES HOSPITAL ANGULAR SERVICE FROM NURSING UNIT FUNCTIONS

HOSPITAL / PATIENT
CONCEPTS

GRID SYSTEMS

ELEVATION

THE CONCEPT IS FOR TOWER TO EXPAND ACROSS THE BASE AND IMPRISON THE BASE TO THE GROUND.
Trying to establish an order to a geometrical concept.
Understanding orientation and circulation was the key to putting things together.
Relationships were important. Earlier studies made it easier
Again trying to put areas where they needed to be. Understanding the geometry.
Here I started to see the site to circulation against the building. Trying to establish a total control over the whole system.
Another generation of the idea previously stated.
LEVEL 1

Documentation of 1st quarter presentation.
LEVEL 3
LEVEL 4
LEVEL 5 & 6
East Elevation
After reviewing a quarters worth of work, I decided to analyze what I had done. I need to go back and rework the program and understand my concepts. I had to make a decision, is this really what I want to do?. At this point my geometry was set, my grid system established, and my program was 90% done.

My answer was yes. I felt the direction taken was in my mind the right step to find a solution.

Some of the faults I needed to work on were as follows:

1) Circulation throughout the hospital.
2) Circulation around and through the site.
3) A sense of orientation for the patient and visitor.
4) A sense of scale.
5) Departmental relationships.

Some of the areas that I had not touched as of yet, I needed to get started:

1) Elevational proportions
2) Sections
3) Perspectives
4) Doctors' office complex relationship

Throughout the project models played a great part of the development. Models allowed me to bring sketches into a hard form and help make decisions along the way. Models allowed me to study proportions and scale of my sketches. It brought to my attention a sense of realities that I could not get from sketch work.

Research continued through this stage of development. They confirmed my ideas of hospital design and they also brought
up new ideas for further research. Overall the project took shape from the ideas brought up from conceptual and site development.

The major concern of the entire project was the patient tower. The views had to be right, with northeast and northeast light. There is very little direct sun on these rooms except early morning and early evening. The traffic of visitors had to be right. The atrium on the ground floor is located at the prime spot on the east side. This area would be a greenhouse for welcoming visitors. The vertical circulation would be visible before the visitor entered the building. On each floor, a day room would be provided for visitors to wait to see their loved ones in the hospital.

Overall the design took shape in this phase leaving very little design left in the final stage. I was pleased at the jury in 2nd quarter at the response given to the design. Following these pages are some of the diagrams and plans of the design at this time.
Study of facade treatment

Study of facade treatment
Aerial View

View of outpatient prop-n.
Very little time was left for design. This was the time to put together what I had learned and proposed in earlier pins. I brought all this together for the final proposals. Looking more into elevations, sections, perspectives, and models got me excited of what the end proposal was going to be. I hope that the hard work that was done early had paid off. I'll let you be the judge.
1st Floor

a) Radiology
b) Emergency
c) Outpatient
d) EEG
e) CT
f) Admissions
g) Chapel
h) Doctors Lounge
i) Medical Records
j) Laboratory
k) Psychiatric
l) Morgue
m) Trash
n) Receiving
o) Central Stores
p) Pharmacy
q) Maintenance
r) Sterilization
s) Housekeeping
t) Administration
u) Volunteers
v) Education
w) Gift Shop
x) Atrium/lobby
2nd Floor

a) Cafeteria
b) Kitchen/Cafeteria
c) Food Storage
d) Restaurant
e) Lobby
f) Kitchen/Restaurant
g) Kitchen/Hospital
h) Dietary offices
i) Receiving
j) Central Stores
k) Mechanical
3rd Floor

a) Obstetric Unit
b) Nursery
c) Delivery
d) Father waiting & gown
e) Doctors/Nurse prep
f) Surgery
g) Control
h) Waiting
j) Intensive Care
k) Coronary Care
4th Floor

a) Medical/Surgical Unit
b) Pediatric Unit
c) Central Nurse Core
d) Control
e) Waiting
f) Medical/Surgical Unit
South elevation from west of site

Aerial View
View of the front entry

Front of the hospital (in view)
Aerial view of back hospital.

Aerial view of front of the hospital.
View of front entry

Hospital road view
View of the area's office complex
Addendum A

With the help of Randy Peacock and Mike Coghlan, we put together a post occupancy study on Ball Memorial Hospital in Muncie, Indiana. The following pages are what we learned from Ball Memorial.

We wish to express our thanks to the following people for their help in our evaluation of environments within Ball Memorial Hospital. Their assistance was invaluable.

Roy Erickson......President of the Hospital
Sunny Spurgeon......Director of Public Relations
Janice Laboyteaux......Director of Admissions
Joyce Hartley......Head Nurse, Emergency Dept.
Mike Rector...........Radiology Department
Mrs. Bromely.........Nursing Services Supervisor

I. OVERALL ENVIRONMENTAL DESCRIPTION

A. LOCATION

Ball Memorial Hospital is located in Muncie, Indiana on the southeast corner of University and Tillotson Avenues. The main hospital complex is located along the eastern edge of the site while the western half is occupied entirely by parking lots.

B. HISTORY

The hospital complex has grown immensely since it was first opened in 1929. The following is a synopsis of the major additions to the hospital and the year in which they were added.
percent of the hospitals in the United States when they are ranked in order of size. It offers an unusually large number of special diagnostic treatment services of which the most important of which are listed below:

- Open heart surgery
- Intracocular lens implants
- Laser eye surgery
- Diagnosis and treatment of cancer patients
- 10-Megavolt linear accelerator for cancer treatment
- Acute and chronic renal dialysis treatments
- CT scanning
- Total joint replacement surgery
- Ultrasound procedures
- Nuclear medicine
- Endoscopy and urodynamic
- A hospice program for the terminally ill

Special Care areas within the hospital are:
- a 17-bed Intensive Care Unit (I. C. U.)
- a 10-bed Coronary Care Unit (C. C. U.)
- a psychiatric in-patient facility
- a Chemical Dependency Rehabilitation Ctr.
- an Oncology Unit
- an Emergency Department
- special care nurseries and an isolation nursery
- a Same Day Surgery area.

The hospital also claims to have the fourth largest medical education program in the state, training 28 interns and residents. They also claim to have what is in many ways the most sophisticated laboratory and x-ray facilities in the state.

2. Method

1. Patients: The hospital serves 21,200 patients in a year's time. On the average (1981 statistics) 52 patients are admitted each day and the hospital has 510 patients in it.

In one year's time over 150,000 outpatients are treated. Again, on average of 411 outpatient treatments are done each day.

2. Employees: Ball Memorial Hospital employs over 2,400 people including both full and part-time staff. This breaks down to between 3.5 and 3.6 employees per patient.

3. Visitors: No figures were available on the number of visitors the hospital receives each day. They must, though, be considered as a category of hospital users who need to be considered in the design or evaluation of a hospital environment.

4. Others: The hospital's influence on the community is very great. The administration is dedicated to re-investing in the local area by purchasing as much of their supplies as possible from local merchants. In this manner many of the local bus-
B. SPECIAL MISSION

Ball Memorial Hospital is run as a business as which deals in the commodity of health. We ran up against this assertion in our original attempts to contact the hospital to arrange to conduct this study. We were instructed that the hospital was a special mission to serve its patients in the best and least manner possible.

In our discussion with the president, Roy Erickson, we were informed that the hospital must be run as a business to insure that the costs be kept as low as possible. Health care is a product that Ball Memorial must sell to the public in a competitive manner. In light of this, the costs must be kept to a minimum to remain competitive.

Another of the more important missions which Ball Memorial professes is teaching. This mission was not always very evident in our discussions. It was, however, through this means that we were able to come to an agreement with the hospital administration allowing us to conduct our study.

A. CONFIGURATIONS

The hospital complex suffers from what appears to have been a severe lack of master planning in its original stages of development. This has resulted in what appears both internally and ex-
ternally as an assembly of unintergrated buildings. There are three very distinct styles of articulation evident which help to compound the already confused exterior configuration. On the interior the continued addition of structures is most evident in the circulation system. The circulation is often tangled and convoluted winding its way through each building in an attempt to connect with the buildings around it. This leads to a great degree of confusion while moving through the complex.

5. HISTORICAL REVIEW

The hospital consists of both high and low-rise units. Most of the older (pre-1950's) buildings on the site are low rise structures which contain support and some patient care facilities. These buildings all lie to the south side of the site. Most of the patient rooms are located to the north side of the site. The ten story tower is the largest, most dominant building on the site. It sits atop a three to four story podium which contains mechanical, technical, laboratory, and patient care facilities. There is very little organization to the layout of high and low rise structures. The tower from the older low rise buildings to the south, this is just one of the many problems on the exterior which derive from the rather haphazard looking additions which have
torn made to the hospital.

C. LAYOUT CONDITIONS

To the east of the hospital is the Burris school and campus. This is a low rise school building which fits very well in style and scale with the collegiate gothic buildings of Ball State University which neighbor it. The hospital's delivery and service areas face onto this building. A recent addition of a high rise parking structure has been sited extremely close to the school building, virtually eliminating any views or sunlight on the schools' west facade. This addition is another in a series of poorly sited and poorly articulated structures which the hospital has added in recent years. It shows a great disrespect for the surrounding community on the part of the designer and others involved.

The southern boundary of the site is bordered by a church and surrounding gardens. The green space is well maintained with many mature trees and garden areas. This area is faced by older original hospital buildings which form a very pleasant, well scaled and detailed boundary. On street parking partially detracts from the appealing atmosphere that exists along this boundary.

Along the western edge of the hos-
hospital site is Tillotson Avenue, a very busy north-south thoroughfare. The western side of the street is filled with residential scale buildings. Along this boundary lie a good portion of the hospitals' parking lots. Some attempts have been made to soften the impact of the parking, but much more work is needed to integrate this area with its surroundings.

To the south of the hospital site is bounded by a playing field belonging to Ball State University. The hospital site along University Avenue (the east-west road which runs along the north side of the site) consists of parking areas along the western end of the site and the large vertical tower and podium structure to the eastern side of the site. The great mass of building at the eastern edge is very abrupt and grossly out of scale with its surroundings.

III. PURPOSE OF POST OCCUPANCY STUDY

The purpose of this study is to quite simply determine the fit between the user and the environment; to study how people relate and adapt to their working environment. This is not a study of how people are performing their tasks, rather, how the facilities help them to carry out these specific tasks.

The study itself is broken down into three areas: a guided tour through the facility to gather initial visual impressions; a series of focused interviews with various
members of the staff; and most importantly, the computation of results from fifty questionnaires distributed to members of the staff in both the Emergency and Radiology Departments.*

*Questionnaires were also a tool for this study.
Addendum B

This is some of the work I had done
on Corbin Regional Hospital at Arrasmith,
Judd, and Rapp & Associate Architects.
I hope an improvement has been accomplished
in the thesis.


