THE OFFICE:
An Analysis of the Evolution of a Workplace

by

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ⓒ Linda Stewart Gatter 1982

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ABSTRACT

Much of the historical discussion concerning the office building
has operated at the level of image. In this reading architects,faced
with specific program requirements and technical possibilities,adopt
a language for the expression of the facade which refers to certain
ideas considered to be important - whether these relate to structural
expression or historical allusion.

In the process the assumption is made that the planning of the
interior space of the office is the solution of a rational equation
whose terms are well understood. While issues like economy and flexibil-
ity have been the explicit basis for a rationalized approach to planning,
these issues have often been interpreted in ways that produce a homo-
geneity and rigidity that does not have any real basis in the program of
the office.

At its most general level,the office presents us with an environ-
ment in which individuals work together in concert with a larger group.
This relationship - of the individual to the collective - presents a
range of conflicts between territorialtiy and needs for communication
that must be understood if the physical organization of space is to
respond to the nature of the institution served.

An analysis of the development of the office which evaluates the
degree to which this relationship has been considered and its manner of
expression allows us to approach the problem of the design of the office
with a critical perspective.

A discussion of the development of the typical office before and
after World War Two is combined with an analysis of two office buildings;
Frank Lloyd Wright's Larkin Building of 1904 and Herman Hertzberger's
Centraal Beheer of 1972. While the typical office responded to contempor-
ary assumptions about the important determinants of spatial organization
in the workplace, often sacrificing territoriality and variety to
perceived needs for order and economy, the two buildings chosen as case
studies are exceptional to the degree that their organization was
developed, in large part, from a more conscious concern on the part of
the architect for the social relationships which characterize the work
environment.

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ACKNOWLEDGMENTS

T A B L E   O F   C O N T E N T S

INTRODUCTION

"My active life, if I ever had one,
 ended when I was sixteen...I got
 the job and the job got me. Everything
 that really matters to me had happened
 before that date. Well, they say that
 happy people have no histories,and
 neither do the blokes who work in
 insurance offices."

Mr. Bowling in George Orwell's
Coming Up For Air

Hertzberger's Centraal Beheer Building, designed in 1972 for an insurance company located in Apeldoorn, raises questions not only of how it relates to his own work, but also of the general relation between architectural production and the program of the office.

The most immediate question that springs to mind from a consideration of his novel approach to the planning of the building has to do with why, in fact, such experimentation has been so little in evidence in the history of that program. The answer can be sought not only in conditions peculiar to the program itself but also in the nature of architectural ideologies.

From the rise of the office building as a separate type of building with its own requirements, certain factors have conspired to make the kind of analysis undertaken by Hertzberger the exception rather than the rule. The typical nature of these buildings as speculative investments encouraged a rationalization of the design process in terms of maximum economy and flexibility. In turn, when the client was a particular corporation, emphasis was often on issues of corporate image, so that the design became an elaboration of facade and lobby spaces for the purpose of projecting an image of power and authority. The large office building in an urban setting was subject to restrictions imposed by the grid and by legislation. One might speculate, as well, on the inertial effect of the large-scale bureaucratic firms which became 'specialists' in the design of such buildings.

Aside from these 'external' constraints, there is the larger issue of the way in which architects have seen their role in relation to the investigation and expression of human institutions.

While the modern movement in architecture had emphasized the link between building and social relations, its translation in the 'International Style',which had so profound an effect in this country on the architectural image of the modern corporation, tended to shift the focus from the expression of a set of values about work to the higher
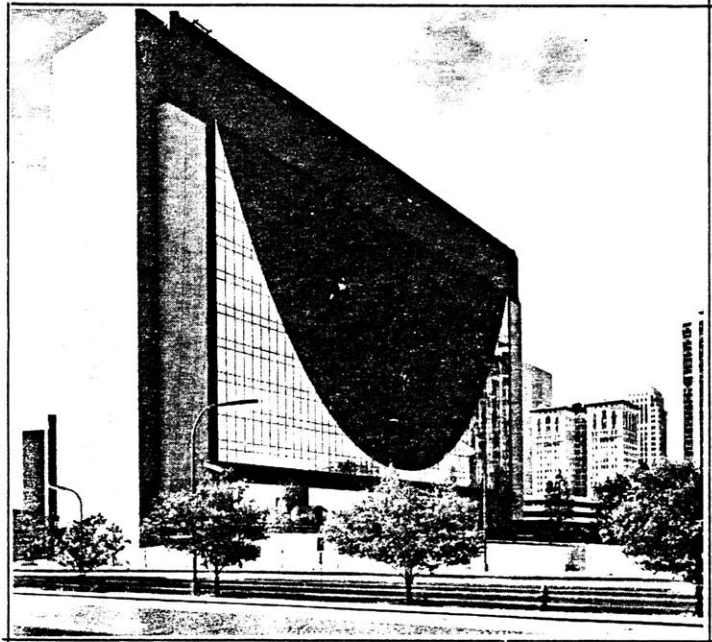
fig.1   Federal Reserve Bank of Minneapolis

'morality' of structural expression. Confronting the 'chaos of the times' with the order and rationality of the machine process, this morality exercised a powerful hold on the architectural imagination. Even Kahn, who spoke so movingly on the nature of institutions, criticized the 'beautiful bronze lady' that was the Seagram Building only because,by failing to acknowledge the force of the wind, she was structurally dishonest.

As a result of all these pressures, interior design split off as a separate activity in the design of the office and, in the absence of other criteria, flexibility became the supreme goal, reaching its extreme (one hopes) in buildings like the Federal Reserve Bank of Minneapolis, which,by supporting the office floors on catenary members anchored in the concrete towers to either side, produces open spaces of 60' x 275' undefined by any columns or walls. The relationship
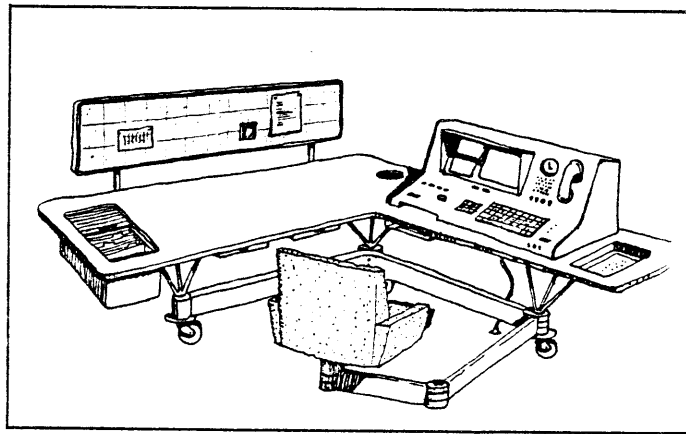
fig.2   Proposal for a 'mobile' workstation, from
        J.Pile's Interiors' Second Book of Offices

between such containers and the activities taking place within them
became more and more disassociated. An article in a book on interior
design from the late 60's proposes a work station on wheels, providing
a maximum amount of mobility. (While suggesting interesting possibilities
for a kind of corporate bumper car, one wonders if some type of inter-
mediary definition then becomes advisable if only in order to know
where to park one's desk.)

     The fact that white collar workers refer to their jobs as
'positions' implies some type of connection with a spatial hierarchy,
which, if ignored by architects, manages to find its expression
nonetheless, often in ways that operate purely on the level of status.

     Thus, 'the brass gets the glass' and 'a title on the door rates
a Bigelow on the floor'. In government offices, where status is
institutionalized, one can tell the civil service level of an employee
by whether their desk is grey steel or wood veneer, and by the presence
or absence of a plant from the government greenhouse.

     If one moves beyond issues of status,however,the work environment
presents a complex field of needs for territoriality,privacy,and
communication. At its most general level, the architectural investigation

of the workplace would have to confront the ways in which the individual
finds her/his place in a collective situation - the meeting of the
private and the public realms.

The way in which this 'meeting' takes place has varied over the
history of the office program - different amounts of definition and
enclosure, degrees of openness, and individual control have marked
the transition from the early cellular offices of the late 19th
century to the modern 'open' office, with its almost total lack of
permanent partitions.

For the most part the architectural history of the office has
limited itself to the building shell. Condit's classic book The Chicago
School of Architecture,which deals primarily with commercial and office
buildings, has 193 illustrations, but only one of these is a plan, and
there are no interior views of office spaces. In the absence of critical
analysis, the perception of the nature of office space is that it is
the result of a scientific analysis of certain needs for communication
in the office. Influenced by the early 'scientific managers' who
followed in Taylor's footsteps,the planning of office space was seen
as the solution to a rational and neutral equation. Attention to the
office itself which went beyond the bounds of such 'scientific'
planning was regarded with a certain amount of suspicion. Joedecke
writes of the Johnson Wax Administration Building; "Is there any point
in generating emotional values of this kind in an office block?"[1],and
Rowe, echoing this conception of the neutrality of office planning,
writes; "The office block...requires elementary circulation and a well-
lit floor area but apart from these it neither can nor should present
any spatial elaboration."[2]

In this neutral view of the planning activity, certain organizational
changes are seen as prompting certain types of spatial arrangements.
How adequate is this view? In a sense. it parallels the view of that
other workplace, the factory, which gives priority to the determining
role of the mechanical process of production. As changes in the organi-
zation of the business unit are seen as producing and determining changes
in spatial relationships in the office, so the introduction of machines
and the requirements for their operation are seen as determining the

form of the factory. But as Robin Evans points out in his study of the
development of the factory, it is possible to view the factory as a
form of social organization which predates the Industrial Revolution -
to that degree the new machines only rendered a certain spatial
arrangement more purposeful and profitable. Without discounting the
importance of the machine, this reading sees a certain system of needs
projected against a preexisting system of regulation and control.In
looking at the office, it is possible to see a similar overlay - a
system of needs that relate to requirements for communication and change
are projected against a system which, especially in the absence of the
kind of machine standardization of the factory, has to promote regulation
through an even stronger system of spatial and behavioural standardiza-
tion. Thus the rational process of planning applied to the office has
operated against a background of hierarchy and control.

The spatial layouts which have characterized the office at varying
times are the result, then, not only of organizational and technological
changes, but also of certain values which limited the types of solutions
which could have been offered at different times. To that degree alternate
proposals came about not only through a rethinking caused by changes
in 'objective' determinants, such as technological innovation, but also
when a designer's perception of what issues were of importance conflicted
with accepted ideas.

The two case studies chosen, Wright's Larkin Building and Hertzberger's
Centraal Beheer, are illustrations of the point. Although the use of
technology was, in both cases, progressive, it was not technical
innovation that characterized the novel nature of the design but
rather the way in which a concern for certain social relationships
was translated into physical form. While both buildings were influenced
both by the organizational structure of the businesses they housed, and
by the nature of existing technologies - the new models they created
for the spatial organization of the office derived in large measure
from a set of values which they brought to the design of the buildings.

The thesis, then, will trace changes in the spatial layout of the
office in an attempt to see what ideas and values have influenced its
development. Two sections will focus on the 'typical' office in America

before and after World War 2 - while the two case studies will look more
closely to individual buildings, in an attempt to understand how
concerns for certain issues, in this case the relationship of the
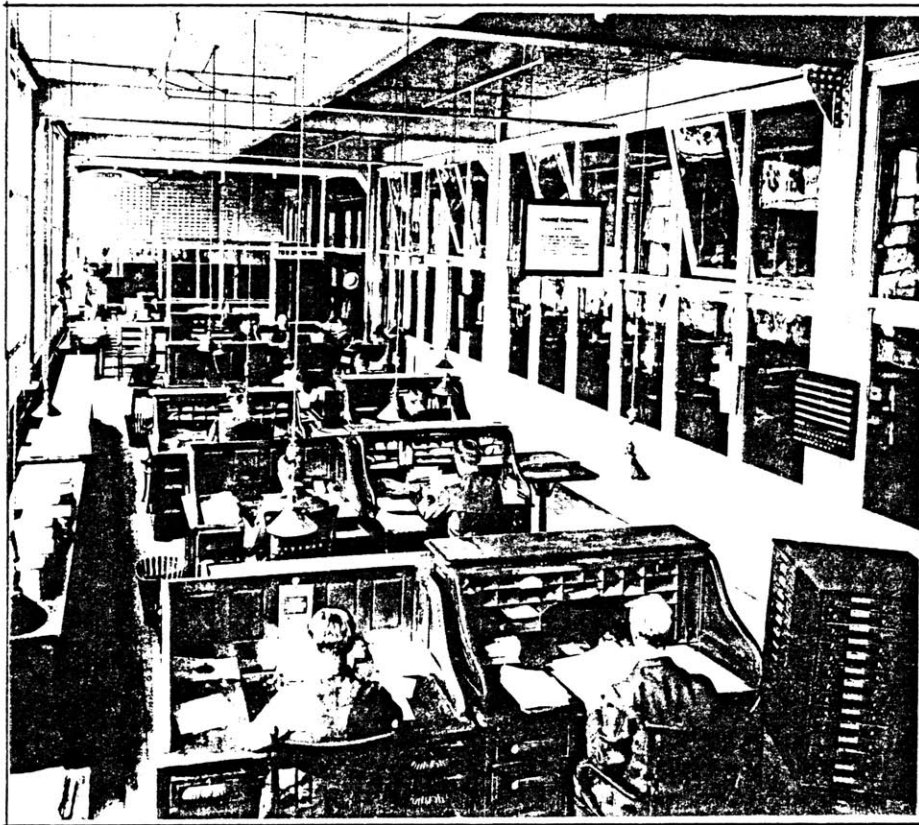individual to the larger social group, found physical expression.

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THE EARLY OFFICE
1890 - 1930

The office program is as old as the need to regulate,administer, and control activities. But until the Industrial Revolution the scale of such operations was small and the office function could be accommodated within other building types. The machinery of government developed within the royal palaces, the affairs of the church were administered from the cathedral chapter house,while the market place,coffee houses, counting houses,and homes of the merchants contained all the office functions necessary for trade.

But the financial and administrative arrangements necessary for rapid industrialization are formidable; the apparatus of distribution and marketing requires a great deal of coordination and control. Because of this growing complexity and intricacy, the office function began to separate itself on a city wide scale during the 19th century. Its growth outstripped the astronomical growth of cities. London,for example,had a population increase of 78% between 1851 and 1891. The number of commercial clerks increased, during the same period, by 476%.[1] In this country the growth was equally pronounced. But while the period after the Civil War saw the rise to power of large corporations, in 1870 a third of all those occupied were still self-employed entrepreneurs (what C.Wright Mills would call the old middle-class). At the same time that business activity was being concentrated in places like Chicago's Loop, much of this activity was characterized by the small scale nature of each business unit. The early office buildings were generally built around the unit of these small offices. Such offices not only answered a real need but were attractive to the clients commissioning the buildings, as they could charge a higher rate per square foot for smaller tenants. The size of this cellular office determined an appropriate structural bay, and their dependence on daylighting influenced the general massing of the building. The maximum depth to which light would penetrate was seen as being approximately 20 feet. A classic early office building like Burnham and Root's Rookery Building of 1885 had a total of 5,000 tenants distributed in approximately

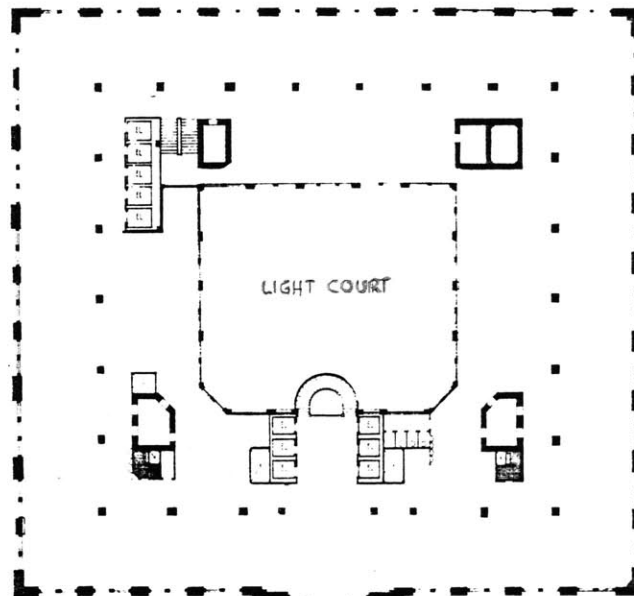fig.1   Rookery Building,Chicago (1898) Elevation

LIGHT COURT

fig.2   Rookery Building, Plan of typical office floor

fig.3   Typical double-loaded corridor of office building of the 1890's

600 offices. While some of these must have been large spaces, the majority
of the offices were 10' x 20' spaces arranged on either side of a
central corridor which received light from transoms over the office doors.
In this case sufficient light for all the offices was ensured by notching
the building mass to produce an interior court, but buildings also
took the form of slabs or towers to assure an adequate supply of daylight
to the interior spaces.

Such offices were private cells, much like hotel rooms. When Adler
and Sullivan were designing the Schiller Building,the client was unsure
whether the project should be an office building or a hotel and so
instructed the architects to plan a building that could be used for
either purpose. The small office, then,provided space almost exactly like
that in the converted dwellings that were their predecessors. A man
went into his office for privacy and to have at hand the records that he
needed. Much of his work might be done outside the office as the

transaction of business before the widespread use of the telephone required

him to make personal calls. The tenants were mostly brokers,agents,and

lawyers who needed or were content with this type of individual room.

The typical desk of the 1880's reflects this orientation toward

solitude. A man faced into his desk and confronted pidgeonholes and

drawers.One author describes the ambiance of an early office.

> Inside the office one found the musty smell
> of stale tobacco ashes, and sooty chimney breasts
> and ceilings. Dust covered the floors,desks,tables,
> papers,and books. Red and blue ribbons and sealing
> wax gave an official atmosphere. Black tin file-
> boxes lettered in gold, advertising the names of
> important clients and estates, impressed the caller.
> Dark oil cloth covered walnut tables, and flat
> top desks with hinged covers were in style.[2]

In time the landlord would take responsibility for cleaning and

maintaining each office, and the fireplace would be replaced by radia-

tors. Ventilation was provided by the exterior window of the office,
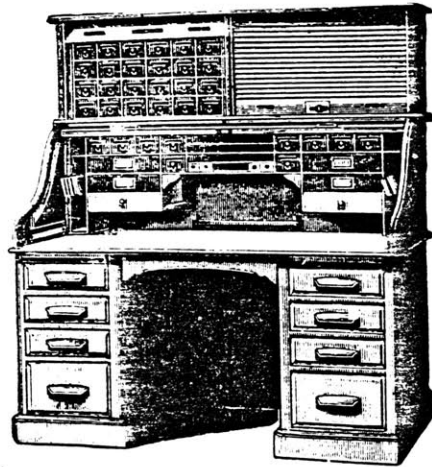
shaded from the sun by an awning.
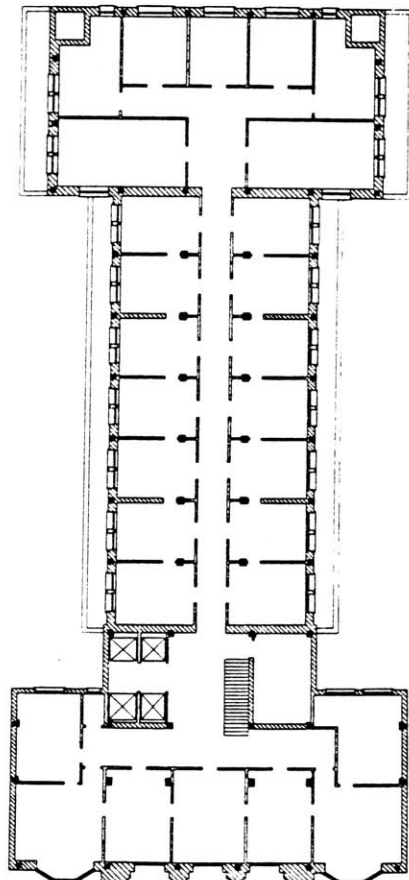

fig.4   Roll-top desk of the 1890's

fig.5   Schiller Building,Chicago
         Plan of typical office floor

It was not uncommon to include facilities for dining in such buildings, and, aside from the more well known examples of the Auditorium and Schiller Buildings, there were other mixtures of office and commercial use. Burnham and Root's Masonic Temple of 1890 featured a central court ringed by galleries which led into offices and shops. The upper floors were to be named rather than numbered,"... allowing Mrs. Brown to be shot up to Smith St., instead of starting with the idea of going up to the nineteenth floor."[3]

While most office spaces were the small cells just described, there was some range of spaces possible. The Masonic advertised that on the upper floors, tenants could lease offices as small as 10' x 14' or as large as 60' x 100'. In the Phenix Building of 1885 the entire extent of the ninth floor, 9,750 sq. ft., was opened up for the use of a single tenant.

Flexibility, then, was an early concern in the office program, as tenants' needs might change over the life of the building. The Montauk Block (1881) had had to be demolished only twenty years after its completion because of the inflexibility of its interior partitions of brick - the 'movable' partitions developed in response to this need were either corrugated iron lath, stiffened by being secured to small I beams, or hollow clay tile - both coated with rock plaster.

As the majority of these buildings were speculative, the final layout and planning of the interior spaces was not finalized until after the building's completion; thus separating issues of exterior and interior design. While architects like Adler and Root placed great emphasis on the importance of sound planning, and while much of Sullivan's discussion in his essay on the tall office building would derive from the regular module of the cellular office, much of the focus was placed on the issue of how the exterior of the building would express both the repetitive and regular nature of the office cell while at the same time signalling the sobriety and solidity of the business world.

Meanwhile, businesses were increasing in size. A company like the Mutual Life Insurance Company, founded in 1843, had become by 1879 the largest corporation in the world, with more than 19,000 policies and gross assets of $90,000,000. Along with the increase in size, the introduction of the typewriter and telephone into the business world
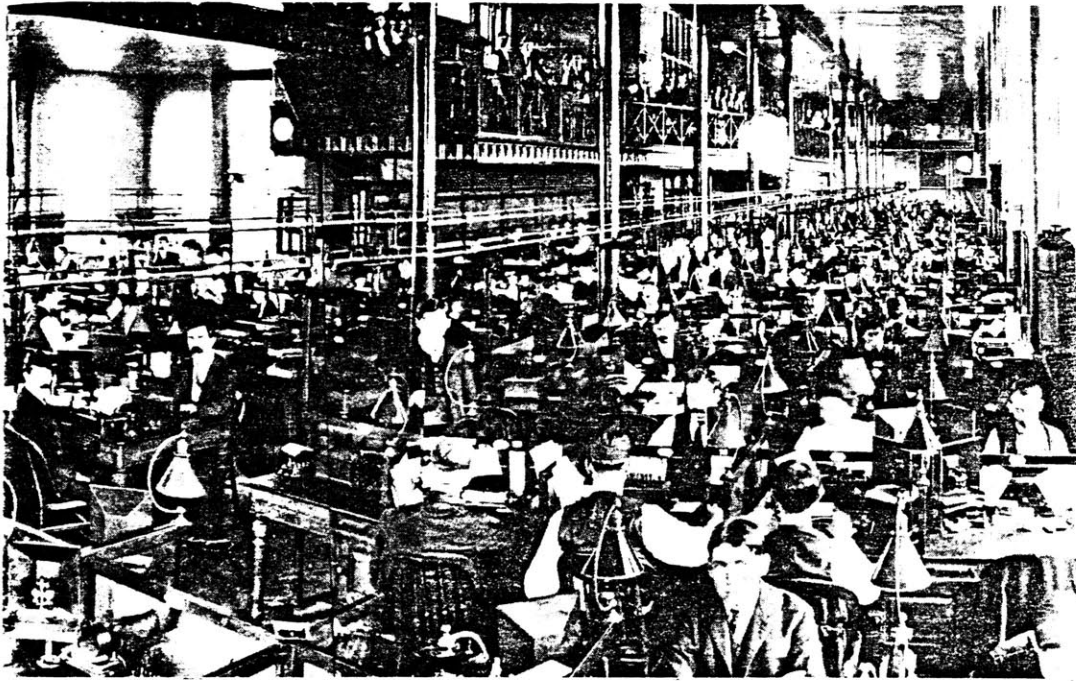
fig.6   Phenix Building,Chicago (1885). A single tenant occupied the
         entire ninth floor.

tended to increase the volume of the information which needed to be
processed.

While Sullivan, in 1896, was writing on the design of the tall
office building - "How shall we proclaim from the dizzy height of this
strange,weird,modern housetop the peaceful evangel of sentiment,of
beauty,the cult of a higher life?"[4] - Frederick Taylor was beginning
his researches into scientific management at the Midvale Steel Company
in Nicetown,Pennsylvania.

While Taylor's theories dealt with a wide range of management
issues,the aspect of his work which had the most impact dealt with his
attempt to apply 'science' to what had previously been considered business
problems. Taylor took the ideas of mechanical efficiency which had
become central concepts in engineering and applied these to the
production activity of a machine and its operative. In Taylor's system,
each operation of work was broken down into its smallest components. These
elements were then rearranged into the most efficient combination. By
invoking the precision of the stop watch and the techniques of measurement
and experimentation, such a process made claim to the inevitability and

objectivity of the scientific method. Once work was so scientifically
plotted, there could be no dispute about how hard one should work or the
pay one should receive. "As reasonably might we insist on bargaining about
the time and place of the rising and setting sun."[5]

Taylor's factory was to be one big machine with all tasks organized
and distributed accordingly, and with men of special training placed
to see that the gears meshed. The worker himself became part of the
process of the machine. One of Taylor's followers wrote

> My dream is that the time will come when
> every drill press will be speeded just so,
> and every planer, every lathe the world over
> will be harmonized just like musical pitches,
> so that we can standardize and say that the
> drilling of a 1-inch hole the world over will
> be done with the same speed. [6]

The Gilbreths extended Taylor's researches by using the technique
of the movie camera. Recording the traces left by a light attached to the
hand as it moved through different operations,they developed a set of
sixteen fundamental elements of hand motion, called Therbligs. Working
with the idea that mental states have physical correlates, they pre-
dicted that their study of motion might even pry into the mind. In The
Psychology of Management,Lillian Gilbreth talks of quantities called
'happiness minutes'.

In the Eastern Rate Case of 1910-11,Louis Brandeis, testifying for
eastern business concerns ,argued that the railroads would not have
to raise rates if they followed the principles of scientific management.
The case was followed with a great deal of interest by an inflation-
weary public and the ideas of efficiency became enormously popular.
An Efficiency Congress in New York in 1911 which featured Taylor as
principal speaker drew 69,000 people. Articles began to appear about
the efficiency of the home. Housekeeping Experiment Stations were set
up to discover the 'principles of domestic engineering'. The home was
"...part of a great factory for the production of citizens."[7] The Effi-
ciency Society of New York included a Church Efficiency Committee.
From the point of view of its members the Crusades were "... only a mob
impulse and a terribly wasteful undertaking in life and time."[8] An
analysis of universities led to the proposal of standardized lecture
notes and the adoption of the 'student-hour' as a unit of measurement.

fig.7   Cyclograph of a surgeon tying a knot.
         Frank Gilbreth c.1914

Classification and standardization became the goal. As human motion
was broken down into 16 fundamental positions, human knowledge was broken
down into 10 major categories (the last by a man who often spelled his
name Melvil Dui for the purposes of efficiency).

Gideon saw studies like the Gilbreths' as being part of a new
consciousness of the Machine Age and paired the delicate records of light
produced by the manipulation of tools with artifacts like Duchamp's
Nude Descending a Staircase. But if the techniques adopted by the
Gilbreths were new, the concerns they exhibit for a precise and
regulated world have roots which extend much further back.

In Foucault's study of the significance of discipline in the 18th
century we see, in examples drawn from practices in educational, religious,
and military institutions, similar concerns for the breaking down of
movement into small time units, the analysis of motion, the prescription
of certain defined postures for given tasks; all of which predate
industrialization yet are strikingly similar to the kinds of formulas
presented by the 'scientific' managers as being mechanically efficient.

Thus Prussian military regulations of the early 18th century broke
movement down into small components; there were six stages to bring the
weapon to one foot, four to extend it, thirteen to raise it to the
shoulder - "...the more time is broken down, the more its subdivisions
multiply, the better one disarticulates it by deploying its internal

elements under a gaze that supervizes them."[9]

One begins to count in quarter hours, in minutes, in seconds.In the early 19th century, the following time table was suggested for the Ecoles Mutuelles

```
8:45 entrance of the monitor
8:52 the monitor's summons
8:56 entrance of the children and prayer
9:00 the children go to their benches
9:04 first slate                              10
```

Activities are stricly cued into a group framework.

> 'Enter your benches'.At the word 'enter',the
> children bring their right hands down on the
> table with a resounding thud and at the same
> time put one leg into the bench;at the words
> 'your benches' they put the other leg in and
> sit down opposite their slates...'Take your
> slates' At the word 'take' the children,with
> their right hands, take hold of the string by
> which the slate is suspended from the nail
> before them,and,with their left hand,they
> grasp the slate in the middle.At the word
> 'slates'they unhook it and place it on the
> table. [11]

Certain educational practices, in their prescription of a use of the body in which nothing is useless or idle,parallel Taylor's 'one best way'. Foucoult notes the routine used in handwriting.

> A gymnastics...whose rigorous code invests the
> body in its entirety,from the points of the feet
> to the tip of the index finger. The pupils must
> always 'hold their bodies erect,somewhat turned
> and free on the left side,slightly inclined,so
> that ,with the elbow placed on the table,the chin
> can be rested upon the hand;the left leg must be
> somewhat more forward under the table than the
> right. A distance of two fingers must be left be-
> tween the body and the table;the part of the left
> arm from the elbow to the hand must be placed on
> the table.The right arm must be at a distance from
> the body of about five fingers from the table,on
> which it must rest lightly. The teacher will place
> the pupils in the posture that they should maintain
> while writing. [12]

The serial space introduced into the classroom made possible the supervision of the individual and the simultaneous work of all. "It made the educational space function like a learning machine, but

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also a machine for supervising, hierarchizing, regarding." [13] The
spaces created by discipline are mixed spaces, "...real because they
govern the disposition of buildings,room,furniture,but also ideal
because they are projected over this arrangement of characterization,
assessment,hierarchy."[14] In the factory this distribution of individuals
in a disciplined space where they could be isolated and mapped is
overlaid with the process of the machine. But as regulation in the
factory was seen as being a neutral consequence of industrialization,
so those writers who called for standardization in the office did so
by invoking analogies to factory work. "An office is a huge machine
with many delicate parts."[15] "There is no reason why the tool of the
office employee should not be chosen with as much care as the tools
chosen for the factory mechanic."[16] In his book Office Management:
Principles and Practice,Leffingwell writes

> If we picture modern business as a hugh machine,
> designed to transform raw material into finished
> products or use values,through a series of
> processes,we see that there is a cycle or a
> number of cycles in which one operation follows
> another...Let us picture to ourselves all these
> functions being performed in their order,like,
> let us say, the progressive assembly of an auto-
> mobile,where the various parts come from many
> sources and are gradually united into various
> sub-assemblies.Visualize the functions of finance,
> production, sales, accounting, and so forth, as
> sub-assemblies each traveling in its cycle on
> and by the same kind of a belt conveyor and
> finally uniting on a single belt. In this picture
> the clerical operations taking place at every
> stage of the process all along the line are
> operations which tend to connect one transaction
> with another,and are therefore analogous to the
> links in a belt conveyor.[17]

In fact there are significant differences between factory and
office work.Like many service related jobs, office work tends to be
multifunctional and therefore less susceptible to the type of precise
breakdown into components which sometimes characterizes factory work.
Even a fairly simple job like typing is not as amenable to the 'one
best way' approach that managers saw as being efficient in the
fabrication of objects. Although the introduction of machines has
affected office work,the office till recently has been much less

machine intensive than the factory. As late as 1951,the amount of
machinery investment varied between $2,659and $19,375 per industrial
worker while for his clerical counterpart the maximum figure did not
exceed $1,000.

Despite these differences, Taylor's factory-based researches
were used as a basis for most writers concerned with office organization
and planning. In the preface to his 1917 edition of Scientific Office
Management,Leffingwell notes;"About ten years ago I began the application
to office work of the principles of the Taylor system."[18] J.W.Schulze,
in The American Office of 1913,cites Taylor's Shop Management and
Muensterberg's Psychology & Industrial Efficiency as being important
influences.Taylor's influence continues to be felt not only in books
like Galloway's Office Management of 1919 and Benge's Cutting Clerical
Costs of 1931,but also in journals like that of the Efficiency Society
(1912-1917),and "Office Management" (1918-1922).

Office planners influenced by these writings used all the para-
phernalia of science in their activities. Maps were drawn showing lines
of communication, a language of abstract visual symbols replaced that
of words, the stop watch was introduced and time charts broke the
hour into 10 six minute segments (even though office workers were
seldom paid by the hour or the day). 'Scientific' methods were enlisted
in the recruitment of employees. Schulze notes with approval one
company's practice of having a catalogue of appropriate characteristics
which could be checked by a foreman before hiring an applicant. In the
case cited, a foreman needing to hire a 'grinder' would find that the
man selected should display the following characteristics.

> Nationality.: Polish,Lithuanian,or American,if
> experienced,or Americans who want to try the job
> after being told that the work is hard,and wet,
> and that the majority of the men are Polish,but
> that the job pays good money.[19]

Psychology is enlisted in providing work incentives.Leffingwell
points to the efficacy of mottoes left on the worker's desks."'Never
Late' cut down tardiness eighteen percent in a week - 'Be Friendly'
had the effect of breaking up an office feud that had hindered
office routine for many weeks."[20] Schulze cites the efficacy of
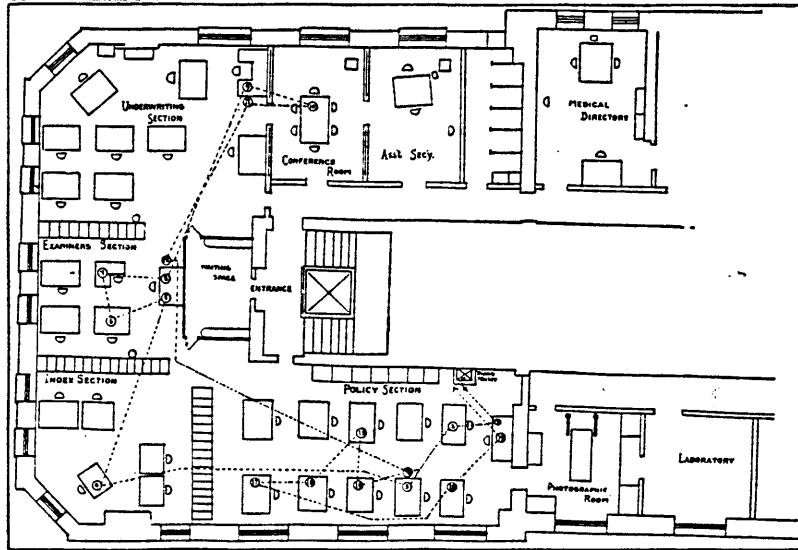competitive races among clerical workers for highest rates of

Figure 12. Departmental Arrangement Under New Organization
Under the new method the course of a policy is confined to one room; its journey is shown by the dotted lines lead-
ing from desk to desk.

fig.8   Diagram of paths of communication in an office c.1917

SYMBOLS	
Typewriting	I
Stenography	+
Dictating to machine	∧
Dictating to stenographer	∨
Interviews (between two persons)	II
Conferences (three or more persons)	=
Absent from department for any reason	⊕
Absent from office	—
Lateness	~
Unoccupied time	○
Miscellaneous work not classified	.
Revision work pertaining especially to section	‡
Supervising work by section heads	◇
Reading, sorting, and routing mail	◈
Messenger service of all kinds	◇
Information service to other departments	◈
Ordering supplies	‡
Preparing bulletins	⊠
Filing correspondence	∥
Checking figures or proof-reading	△

fig.9   Chart of symbols designating duties of
         employees.Designed to facilitate
         supervision

COMPTOCARD
TRADE MARK

NOTE. To find ELAPSED TIME deduct lesser cancellation
from greater and point off one place to the left.

121	122	123	124	125	126	1
111	112	113	114	115	116	1
101	102	103	104	105	106	1
91	92	93	94	95	96	9
81	82	83	84	85	86	8
71	72	73	74	75	76	7
61	62	63	64	65	66	6
51	52	53	54	55	56	5
41	42	43	44	45	46	4
31	32	33	34	35	36	3
21	22	23	24	25	26	2
11	12	13	14	15	16	1
1	2	3	4	5	6	

Elapsed Time 7 Hours   Rate per $ Hour } Ton

BACK

Form No. 555-100M-8-13
CRUCIBLE STEEL CO. OF AMERICA
SPAULDING and JENNINGS CO.

Date _____ Order No._____
Emp. No._____ Name_____
Mach. No._____ Dept._____
                Grade _____
                Size Started_____
                " Finished_____
                Weight_____
Remarks:_____   Day Shift ★
                                Night Shift ★

Hour	Minutes								
6	6	12	18	24	30	36	42	48	54
7	6	12	18	24	30	36	42	48	54
8	6	12	18	24	30	36	42	48	54
9	6	12	18	24	30	36	42	48	54
10	6	12	18	24	30	36	42	48	54
11	6	12	18	24	30	36	42	48	54
12	6	12	18	24	30	36	42	48	54
1	6	12	18	24	30	36	42	48	54
2	6	12	18	24	30	36	42	48	54
3	6	12	18	24	30	36	42	48	54
4	6	12	18	24	30	36	42	48	54
5	6	12	18	24	30	36	42	48	54
6	6	12	18	24	30	36	42	48	54

FRONT

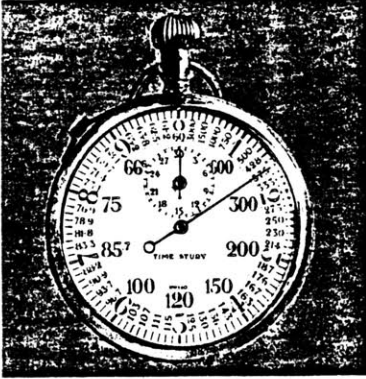fig.10   Time chart divided into
          6 minute intervals.

fig.11 Stop watch used in time-and
motion studies

efficiency - the results to be marked on a blackboard prominently
displayed in the office.

The only direct parallel with the efficiency strategies of the
factory, which concentrated on wasted motion ; related to activites
like folding letters - an operation that was broken down into four
steps.In fact, although procedures were described as being adopted
as motion saving strategies,they were more often for purposes of
supervision and regulation. Schulze writes

> By also standardizing the use of the drawer in the
> desks through the office, it is possible to cut down
> waste of stationery and loss of motion. For example,
> in one concern, the general rule is that the top left
> hand drawer is used for current unfinished work. The
> lower left hand drawer is used for towels and personal
> articles. The top right hand drawer is filled with
> convenient sized compartments for lead pencils,erasers,
> rubber bands,pink slips,letter heads,and envelopes.
> The lower right hand drawer is used for loose leaf
> binders containing instructions issued by the office
> manager and other officials from time to time. The
> office manager knows that he can go at any time to
> any desk and discover all the work that is unfinished
> by looking in the upper left hand drawer. [20]

In the interests of supervision, writers argue against the use of
private offices - the office space is opened up and workers are
centralized. The roll top desk is replaced by one that makes it possible
for everyone to be clearly seen. Clerical workers face in one direction
so that their attention is focused either on the work in front of them
or at the clock at the head of the room - the essential office 'machine'
which produces information in an ordered and segmented sequence.
"Lessening the causes of confusion the environment is congenial and the
control of the force is more easily maintained."[21]

26

THE WRONG WAY TO OPEN MAIL

In even so simple an operation as opening mail there is a right way and a wrong way. Compare this illustration with the one on the right, showing a motion-studied table which increased the output one fourth

THE RIGHT WAY—20% SAVED

This "motion-studied" mail opening table made possible a 20% increase in the output. This girl takes out money and letters and pins and sorts them at the rate of 310 an hour. Note the sunken baskets and the footrest

fig.12 'The one best way' to open mail,from Leffingwell
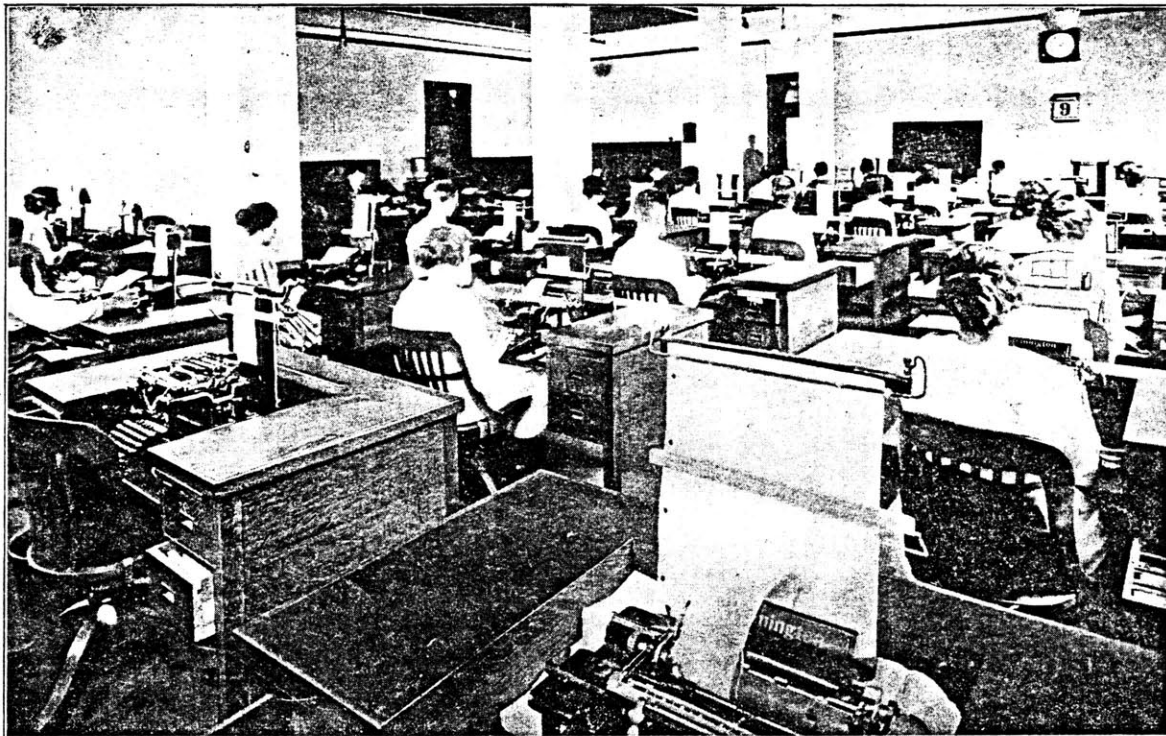
Figure 26. A Well-Arranged Stenographic Department

A well arranged and completely equipped stenographic department in which the utmost use is made of the space available without -overcrowding. Note the position of the clock and calendar in full view of all operators.

fig.13 Recommended arrangement of workers, from Schulze

In the organization of space, the appearance of efficiency is as important as efficiency itself. Leffingwell captions one photograph of an office interior; "Although this office is arranged in a fairly effective manner, it does not look well, and cannot be efficient throughout because of the lack of standard equipment."[22] Another author notes; "The appearance presented by uniform desk equipment throughout the office suggests the existence of well-ordered method. "[23] The office thus accomodates for its lack of machine regulation by appearing more machine-like.The rectilinear arrangements of desks recommend themselves less for the way in which they facilitate communication as for the way in which they refer to the assembly line of factory production. "The desk is a tool for making the quickest possible turnover of business papers."[24] At first glance,the secretarial desk and chair presented in one book appear odd,since it would seem that the desired result could be more easily achieved by simply raising and lowering the machine. But if the desired result includes the creation of something which looks like a 'contraption',the device succeeds admirably.Not particularly efficient in its use of space (the area behind the typewriter is unusable), it nonetheless 'appears' to be efficient. The table/desk arrangement shown also allows physical movement without having the worker move away from her/his assigned position. Each individual has his own place,and each place its individual. Schulze, in discussing partitions,writes; "It is also claimed that movement about the office is considerably hampered (by their use),but this is, in the long run, an advantage, as there should be as little movement as possible anyway." [25] Like the disciplinary spaces of the 18th century 'manufactories' discussed by Foucoult,the aim of this positioning is to establish presences and absences, to know where and how to locate individuals - "One must eliminate the effects of imprecise distributions, the uncontrolled disappearance of individuals, their diffuse circulation, their unusable and dangerous coagulation."[26]

The rigidity and lack of variety within the workplace is given a scientific basis. Benge writes

> Distractions may be defined as unnecessary stimuli
> presented to the senses.Bright light, darkness,or
> alterations of the two ,vivid colors,flashily dressed
> employees, and moving objects within the field of
> vision are the principal sources of visual distraction.

A COMMON SENSE OFFICE

This illustrates a large office equipped without luxury, effectively laid out, well lighted, and containing many conveniences. One does not associate an office like this with extravagant salaries or with waste or wasted effort

AN UNSTANDARDIZED OFFICE

Although this office is arranged in a fairly effective manner, it does not look well, and cannot be efficient throughout because of the lack of standard equipment. Almost every desk is of a different pattern from every other

fig.14 'The appearance of efficiency', from Leffingwell
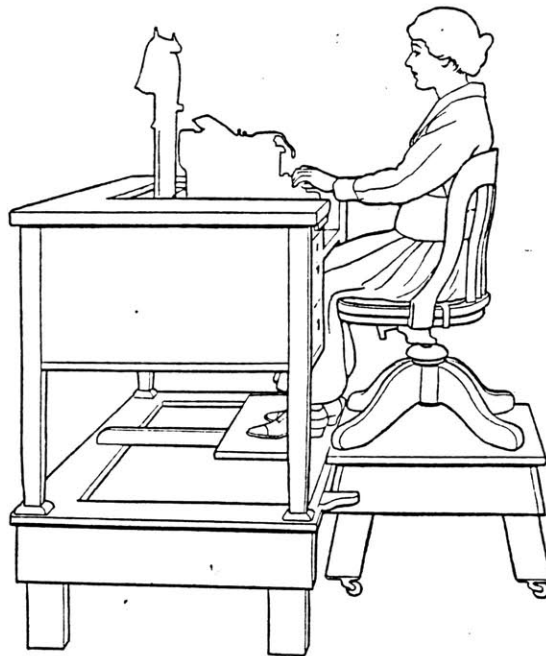
Figure 29. (a) Adjustable Desk—Stenographer Sitting
The desk and chair are placed on platforms so that the operator can work either in a sitting or standing posture, as she prefers.

fig.15 An 'efficient' adjustable desk, from Schulze

> Psychologists state that for each stimulation of a
> sense organ there must be a corresponding response,
> usually expressed in some form of muscular movement.
> Distractions, therefore,waste energy. Aside from
> the scientific basis underlying, it is a matter
> of common knowledge that employees do their best
> work under a minimum of distracting elements. Hence,
> management should endeavor to eliminate those factors
> which, consciously or unconsciously,rob the employee
> of his time, attention, and energy.[27]

The rationalization called for by managers leads to an increasing

homogenization of the office, as standardization extends to issues of

dress, speech, and behaviour. The aprons and sleevelets worn by women

employees received approval not only because they protected the

worker's clothing,but also because they gave uniformity of appearance.

Galloway complains of the deficiencies found in the speech of office

employees, resulting from incorrect pronunciation, "aggravated by the

presence of foreign accents"

> To have the incidental speech of the organization
> smooth and accurate is at least as important as
> to have the office equipment in good order...great
> as is the waste resulting from ineffective correspondence,
> it has been much less than the waste resulting from
> inefficient talk...standardization of the speech
> of the organization will make for increased product-
> ivity as truly as does adjustment of the procedure in
> a factory. [28]

As a remedy to the 'indistinct and confused' nature of ordinary

speech, the author proposes 'tactful supervision' as well as the

provision of a number of forms which supply the worker with the

proper phrasing of often used phrases.

Such standardization follows the worker into his home. Galloway

provides tips on making the newcomer welcome into the office hierarcy.

"As soon as conditions seem to justify it, his home surroundings are

investigated and helpful suggestions offered,if necessary;of course,

tactfully, to avoid any appearance of paternalism."[29]

This type of regimentation evokes comparison to military life-

an analogy not infrequently made by the authors of management manuals.

Sculze recommends the use of swatches of colored cardboard in laying out

a floor plan."The swatches, cut approximately to scale,can be arranged

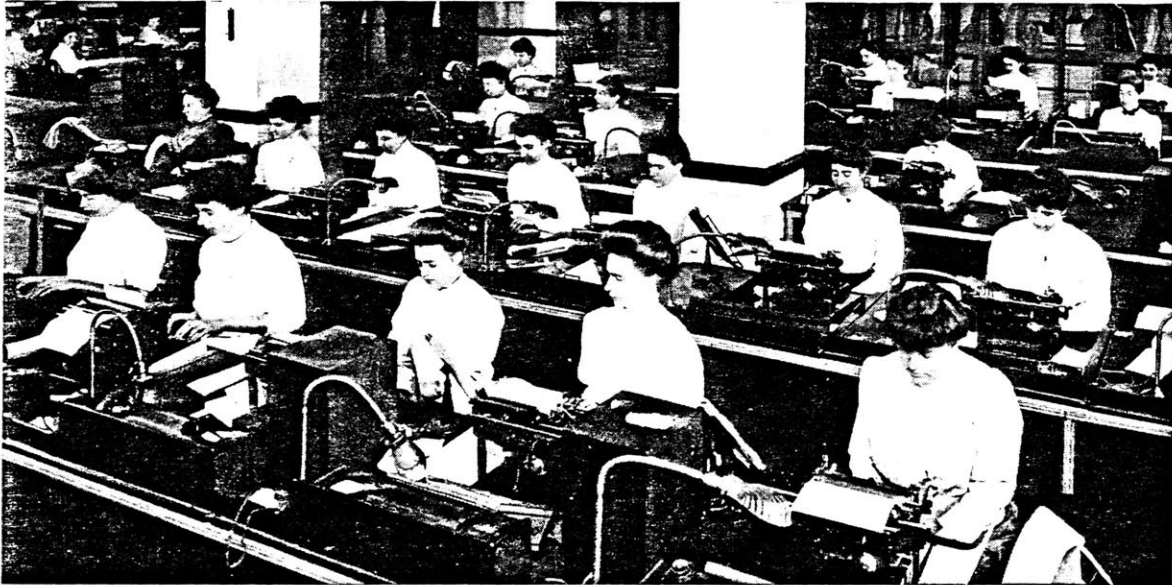on a large sheet of paper on which the floor plan is drawn, just as a

fig.16 Layout of workers c.1917 showing uniformity of appearance

fig.17 Leffingwell recommended this layout, with the exception
of the center aisle,which he considered to be wider
than necessary

general would position his troops on a map showing the field of battle."[30]
Galloway,in referring to certain habits which should be inculcated in the
office worker,writes that with time they will become automatic,"...like
the military carriage of a properly trained soldier."[31]

The 'look' of the office which developed in response to these
pressures remained largely unchanged until after the Second World War.
The pattern of the cellular office continued to be used where appro-
priate. Schreve, in his 1930 essay "The Economic Design of Office
Buildings",calls attention to this basic unit, the 20' x 25' 'cell'
which multiplies around the central core and so determines the floor
plan. But in the case of larger firms, where clerical staffs outnumber
managerial personnel, the tendency is toward less reliance on individual
offices and more on the open space of the 'bullpen'. A survey of 46
office buildings housing insurance companies conducted in 1933 indicated
that, in almost all cases, the percentage of total floor area given
over to private offices was less than 10% - in some cases there were no
private offices at all.Spatial definition,when it existed, was provided
by the use of railings or partitions of wood and glass or steel;the
latter varying in height from 3 feet to full ceiling height.

In the spatial coordination of large groups of workers,the idea
of modular planning becomes important. Schulze cites New York's
Metropolitan Life Insurance Company as an example of a large office
which had determined modular units for its departments. A typical
planning unit there involved 5 feet of desk space with 3 foot aisles and
42 inches between desks. In general the amount of space allotted each
worker was quite small. The 1933 survey shows the typical floor area per
clerical worker as being in the range of 40 - 50 square feet. The
necessity to 'pack' so many employees into a given space led to the desire
(later to become an obsession) to have a space as free from obstructions
(columns) as possible. Benge in 1931 compares two office layouts;one with
column spacings of 12' x 14', the other with spacings of 21' x 25' to
exhibit the greater efficiency of the latter. The argument is valid if
one accepts the premises that the layout of the space must be rectilinear
and that the greatest number of employees should be packed into a given
space.
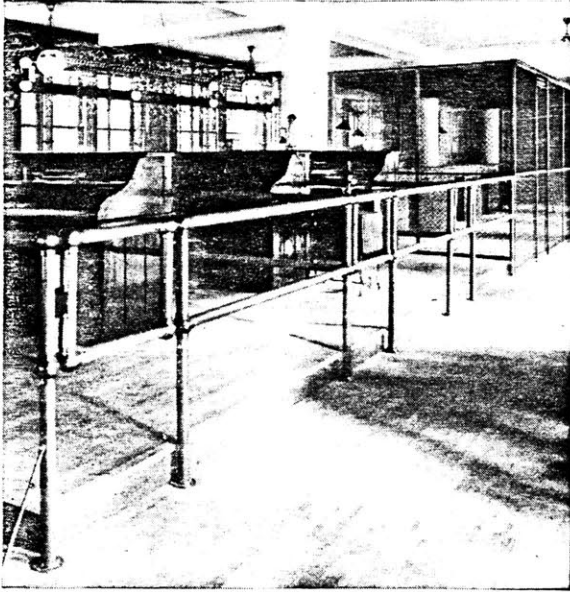
PRIVATE OFFICES WITHOUT PARTITIONS

Many offices use this method of obtaining privacy to a greater or less degree. It does not shut off light and air but neither does it wholly eliminate the harsher noises and, therefore, cannot be entirely recommended
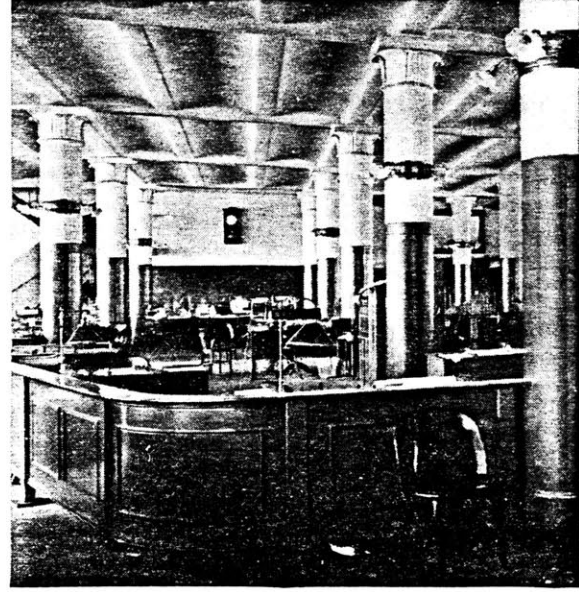
ANOTHER WAY TO DIVIDE THE OFFICE

Under certain conditions – when brief consultations with many customers are frequent, for instance – partitions of this sort are often favored, although perhaps they are a bit more expensive than some other types

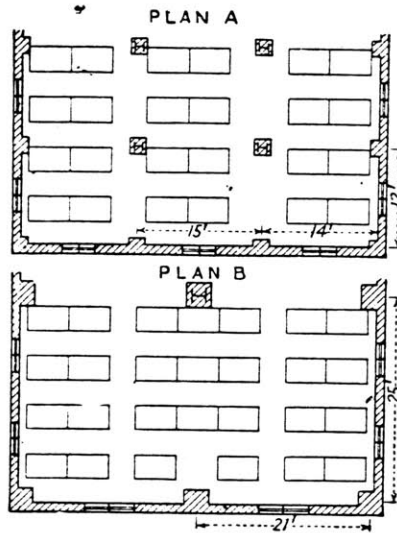fig. 18 Methods for partitioning areas within the office

PLAN A

PLAN B

fig. 19 Diagram from Benge's "Cutting Clerical Costs" comparing the effect of different structural bays

Even given the preference for wider column spacing, the size of
structural bays did not increase dramatically from the earlier office
buildings. Sullivan's Guaranty Building of 1895 had 15' x 20' bays,
while the standard dimension in the 30's varied from 16 to 24 feet.
As in the earlier office, daylight was the most important source of light,
continuing to affect the depth of the building and the floor to
ceiling heights. Leffingwell wrote in 1917 that it was not practical to
light an office in excess of 30 footcandles, as the heat generated by
the incandescent fixtures would be intolerable. The minimum standard was
set at 10 footcandles,although in practice the levels achieved in many
offices were half that number. The individual desk fixtures of the early
office were replaced by the cheaper system of direct or indirect
general illumination provided by ceiling fixtures.

Heating is provided by a system of steam heat using radiators.
In the large rental buildings there is generally no system of ventilation
beyond that provided for interior toilets and basement areas - but in
buildings commissioned by the large corporations and insurance com-
panies systems of forced ventilation and provisions for filtering and
humidifying the air became more common by the late 20's.

Awnings are replaced by venetian blinds and Leffingwell in 1917
suggests the use of tinted glass to absorb excess heat from south and
east-facing glazing.

More attention is given to the issue of acoustical control. Earlier
strategies had included the use of felt,covered with muslin,on ceilings
and a system of wool overlaid with linoleum for the floor.The 20's saw
the introduction of various types of acoustical tiles and plasters.

A wider range of amenities is offered to the employees of the
larger concerns. The earliest office buildings had often made provisions
for a restaurant - larger concerns at the beginning of the century
provided not only cafeterias but also libraries and recreational
facilities. Schulze writes;

> The Curtis Publishing Company...has established
> restaurants,cafeteria,recreation rooms where
> employees may dance during the noon hour. Rest
> and reading rooms are provided for girls. Most
> of the large insurance companies have established
> restaurants in which the prices are placed at cost.
> The company lunch room has become a national

institution.Rest periods,usually ten minutes each,
have been established in the morning and afternoon
in many offices; libraries are very common;
athletic organizations, hospitals and other
similar welfare features may be found in almost
any well-managed office. [32]

The provision of facilities for physical activity was considered
particularly important. Earlier writers had stressed the importance of
exercise to the sedentary clerical worker. As Leffingwell put it;
"Managers realize that it is better to lose half an hour than suffer a
twenty-five percent reduction in the productivity for 4 hours." [33]
Exercise was provided by the use of calisthenics in the office itself or
by promenades on roof terraces like the one provided in Wright's Larkin
Building.The provision of bowling alleys and gymnasiums was not
uncommon in offices built for large companies in the 20's.Concerns with
more suburban locations could provide more extensive amenities. The
Provident Mutual Company of Philadelphia,for example, provided in its
1928 headquarters 6 tennis courts, a baseball diamond,a soccer field,
indoor and outdoor hockey fields, and a bowling green. Provision of

FIGURE 44: Brain and muscle both are apt to get fagged out after two or three hours of top-speed work. When that happens, try throwing the windows wide open, and then go through some simple calisthenics. In the office shown here, work is found to improve materially after five minutes or so of exercise and relaxation.

fig.20 Photo,from Leffingwell, showing the value of exercise

such facilities was not only useful in providing places for exercise
but also in contributing to the esprit de corps of the firm.

The survey of office buildings published by the Life Office
Management Association in 1933 offered an extensive list of the
component parts of the building program,from selection of the site to
the type of clocks that should be used in the offices inside.Category
11 dealt with types of architecture and building construction and lists
7 possibilities for 'style',from 'classic' to 'modernistic' . While the
thinking of the architectural community of the 20's focuses on 'choosing
from the list' (Hood writes in 1924 of the two tall office buildings he
had designed up to that point;"They are both in the 'vertical'style
or what is called Gothic simply because I happened to make them so.
If at the time of designing them I had been under the spell of Italian
campaniles or Chinese pagodas, I suppose the resulting compositions
would have been horizontal."[34]),the interior layout of the office was
increasingly standardized by the application of the type of management
thinking described above.

In some ways, the scientific approach sponsered by Leffingwell,
Galloway,et.al.,had some positive consequences. Studies that related
to purely physical issues, like comfortable seating positions and
lighting levels, attempted to set certain standards that would improve
conditions for workers. In terms of territorial definition, however,
concerns for the individual were always subordinate to concerns for
organizational efficiency, which were in turn equated with needs for
order, regularity, and standardization.

In his essay on the tall office building, Sullivan had written;
"Only in rare instances does the plan or floor arrangement of the tall
office building take on aesthetic value."[35] For the most part,architects,
from the beginning of the program, had concerned themselves with issues
of facade design, leaving the arrangement of interior space to others.
In the next essay we will look at one of those 'rare instances' where
an architect proposed another model for the organization of space in the
office.

Think This Over

Can you say truthfully, that you always do things just the way
you would do them if you owned the whole works?

•

WHO IS THE BOSS---?

" Who is the Boss ?"
" The members of the Company ?"
" No."
" The Department Head ?"
" No."
" Who is, then ?"
" Why, the Customer."

It's the Customer we are all working for. He pays our wages. If it were not for the Customer we would all be looking for a job, and it might not be as good as the one we have now. If you see one of the Company coming, and are in idleness, don't jump, unless there is something left undone; but if you see the real boss—the Customer coming, or if you get a letter from him—jump, and jump as if your life depended on it.

This is the keynote of your value here; namely, satisfactory service to Customers.

1725A-1500-6-13 (9185)

fig.21 Blotters distributed weekly to employees,from Schulze
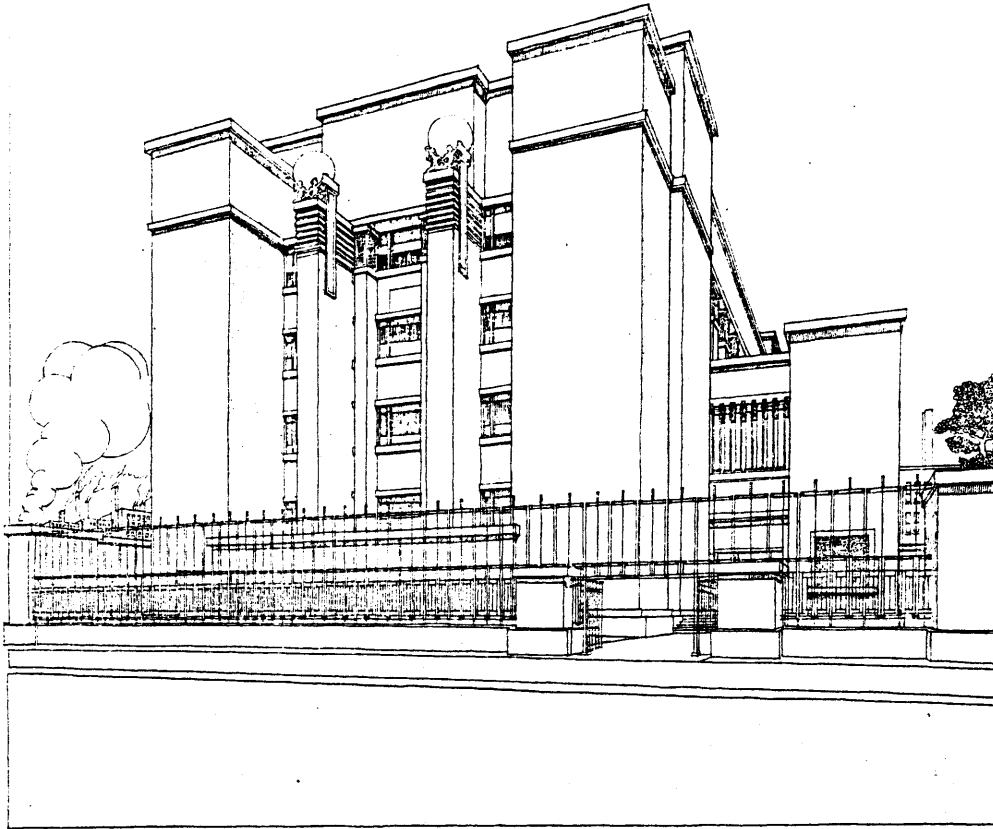
THE LARKIN BUILDING
FRANK LLOYD WRIGHT
1904

The commission to design the Larkin Building came to Wright
as a result of his association with the Martin brothers. Dwight
Martin, a partner in the Larkin Company, was enthusiastic about the
house Wright had designed for his brother in Oak Park, and in 1903
asked him to design his house in Buffalo as well as the administrative
headquarters for the expanding firm.

The Larkin Company, a nation-wide mail order firm which produced
and distributed soaps ('From Factory to Family'),had been founded in
1870 by John Larkin and his idealistic brother-in-law Elbert Hubbard.
By the time of Wright's involvement with the firm Hubbard had left
the company to devote himself to his craft colony in nearby East
Aurora,but although he had little direct influence on the building
itself, his presence in the story is interesting to the degree that his
thinking was characteristic of the American attitude toward business.

Hubbard, like Wright, was a romantic individualist. He exhorted the
readers of his magazine "The Philistine","Wear thy hair long, it is a
sign that thou art free." Impressed by the ideas of William Morris,
his Roycroft Colony devoted itself to craftsmanship in just those areas
which would later appear in Wright's first Taliesin prospectus –
typographical design,printing,woodworking, and weaving.

Given 'Fra Elbertus's ' posture against social convention and his
emphasis on craftsmanship, it seems paradoxical that he could also
be the author of a series of booklets entitled <u>Little Journeys to the</u>
<u>Homes of Great Men</u>,featuring essays on the achievements of men like
Philip Armour, John Jacob Astor, and Andrew Carnegie.While one might say
that Hubbard had a flair for the incongruous (the rooms in his guest-
house at Aurora were named after the 'famous men and women of all time –
Socrates,Edison,Beethoven, and Susan B. Anthony);his simultaneous
commitment to a kind of moral individualism and his idolization of the
successful business man was not simply another peculiarity of his
thinking.

While the period after the Civil War in this country was marked
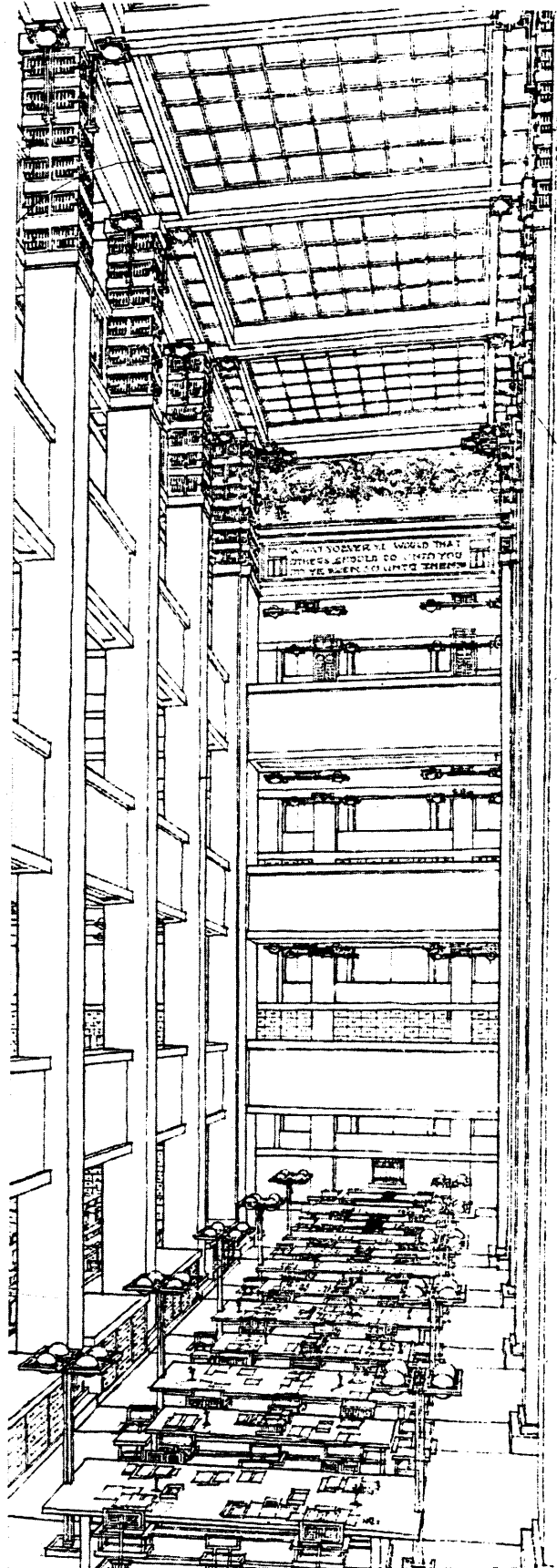
fig.1   Perspective of central court

by the formation of trusts as the profit potential of collectivism became apparent to business interests, in the popular imagination business was still a self-regulating society propeled forward by the will and energy of individual 'pioneers'.The success of this idea-image points to the merger of two powerful strains in American thought - on the one hand the Calvinist ethic, with its stress on individual self-interest as a prime mover;on the other the social theories which had arisen from one interpretation of Darwin's research in natural selection.

While evolutionary thinking was to have its own impact on the thinking of the architectural community, the translation of these theories into Social Darwinism provided a conveniently flexible ideology. While it could be used to justify the status quo as being based on immutable natural law, it also left the door open to the possibility that individual drive and energy would be rewarded with success. Thus Hubbard took his Little Journeys during the period in which Alger's books were at the height of their popularity,both arguing for the force of the individual precisely at the time when business itself was becoming more collectivized.

Although Wright's view of the place of the individual in the social group was characterized more by a philosophy of cooperation rather than competition, and while he would later express his repulsion for the growing concentration and power of corporate business; to an extent he was part of this thinking that saw business activity as being a progressive force. In his 1908 essay "In the Cause of Architecture", he had pointed to the businessman as being one of the few patrons of his new architecture.

> Even cultured men and women care little for
> the spiritual integrity of their environment...
> so long as their dwellings are fashionable...
> There are exceptions, and I found them chiefly
> among American men of business with unspoiled
> instincts and untainted ideals. A man of this
> type usually has the faculty of judging for
> himself.[1]

His attitude toward the firm whose headquarters he was designing was expressed in an article written for the company journal,'The Larkin Idea',in which he explained to 'the Larkin Family' how he came to the design of the building,the'brains and nervous system' of the enterprise
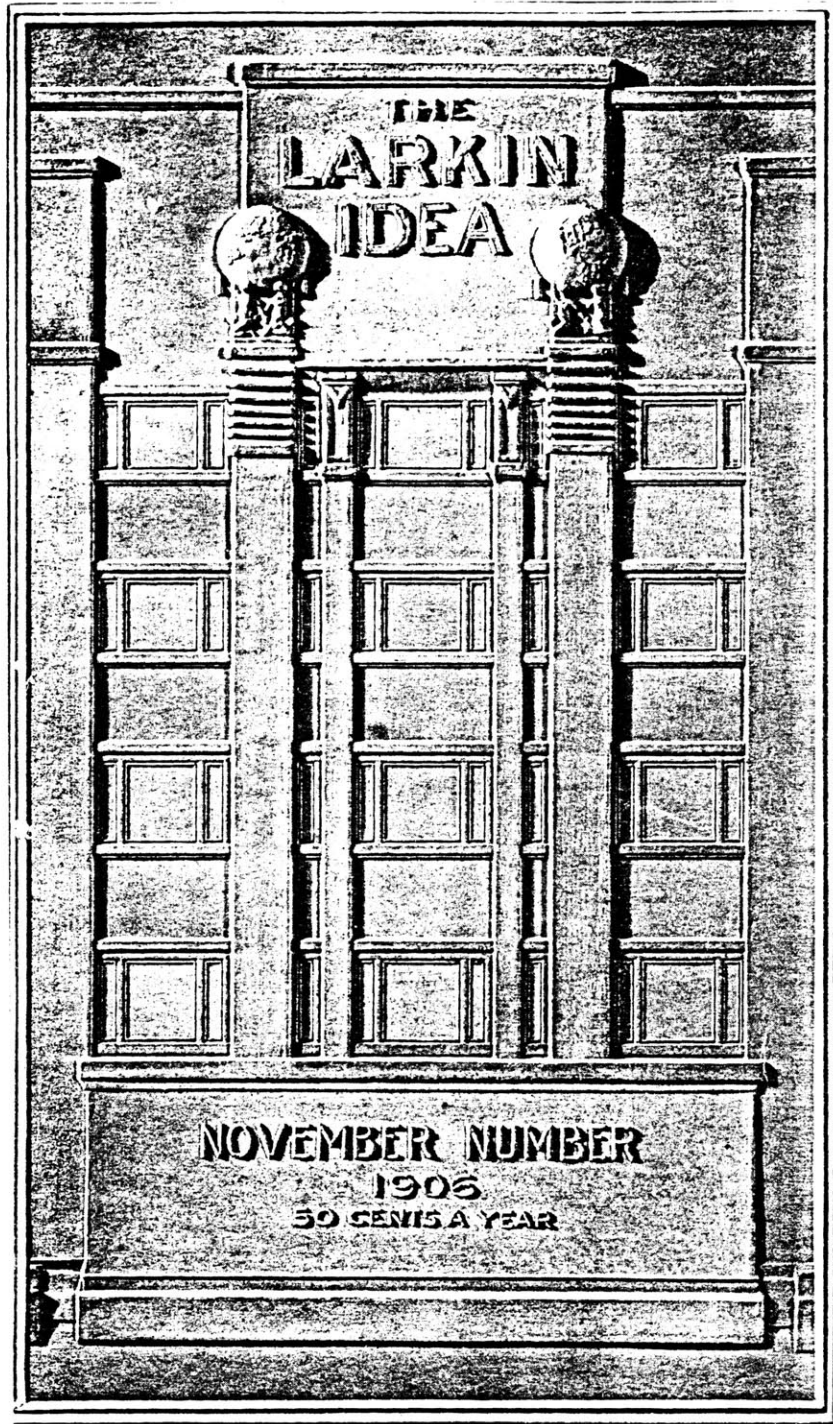
fig.2   The extent of the 'Larkin Family' in 1906

fig.3

The house journal
of the Larkin Company

THE
LARKIN
IDEA

NOVEMBER NUMBER
1905
50 CENTS A YEAR

fig.4   A state group at work on the 4th floor gallery

which would "...make its nervous energy and intelligence effective to
the utmost, and ...let the light of the Ideal outwardly shine in the
countenance of an institution that has in reality become ' a great
business of the people'".[2]

By 1904 the 'Larkin Family' was large enough to occupy, in its
factories and warehouses, 50 acres of floorspace. The administrative
operation of the business, which employed 1800 workers, was divided into
state groups within which all the work of caring for the orders was
completed - packing slips and shipping tags were made out, routing was
done, records were entered and all correspondence incident to the
orders was carried out. Thus each state group was, in effect, a complete
business unit. The organization of the building reflected that
division, with the separate state groups arranged on the second, third,
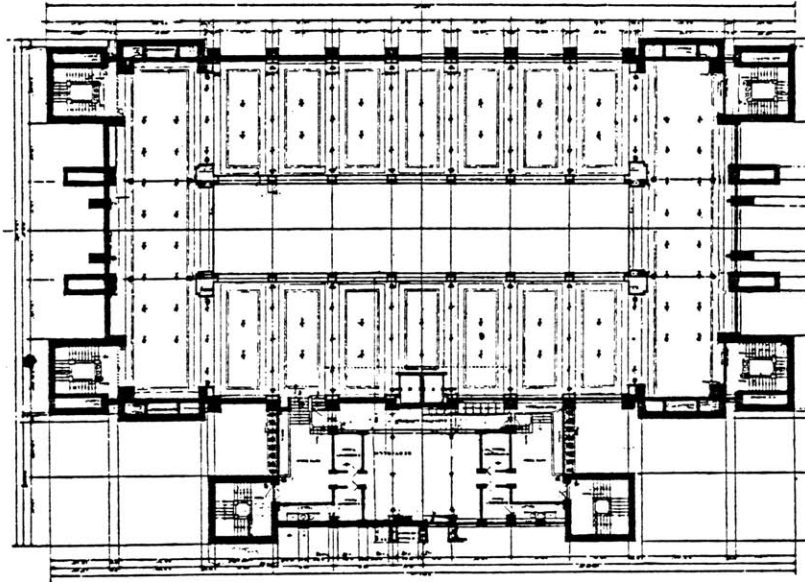
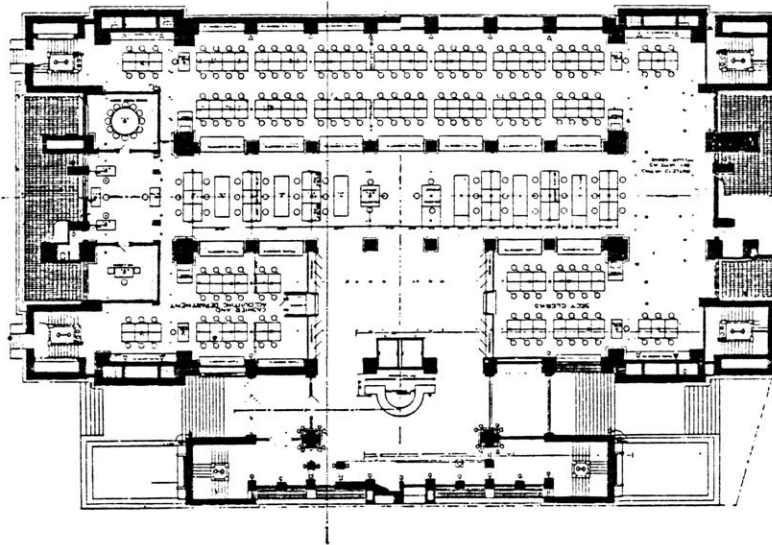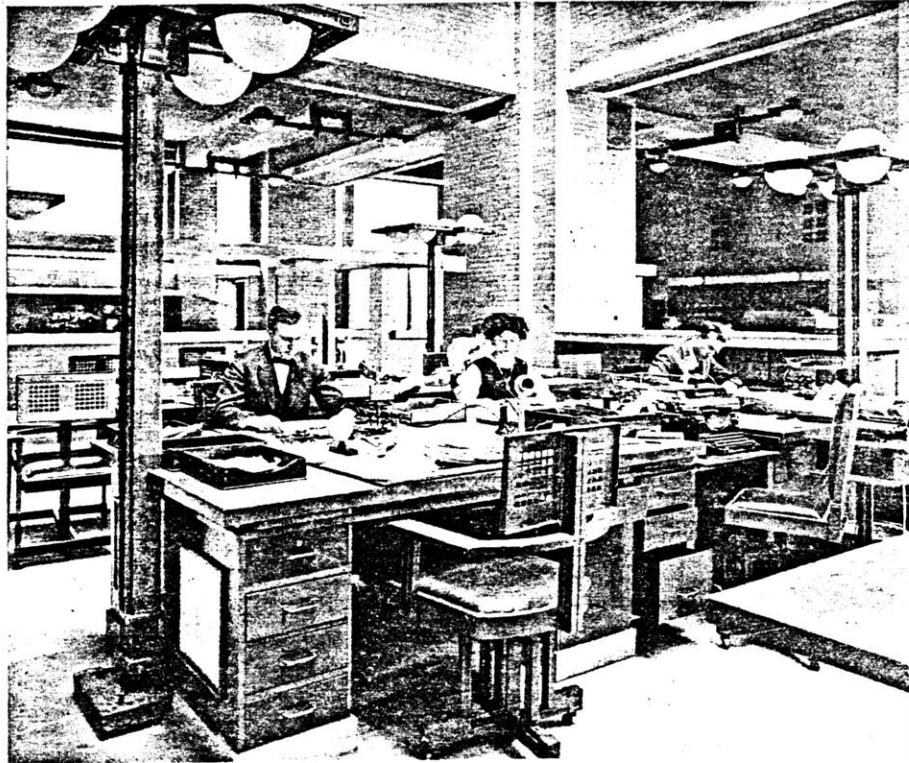fig.6   Typical office floor

fig.5   First floor plan

fig.7   The managers' area on the main floor of the central court

and fourth floor galleries above the large central court - autonomous
but in easy communication with each other and with the managers, located
in the center of the main floor below them. The 'typewriters',as they were
called,were concentrated in one area of the second floor. On the fifth
floor, above the working areas, was a kitchen and restaurant,where one
could buy a 'satisfying' lunch for a dime and a more elaborate one for
a quarter. Above this was a conservatory, visible from the main floor
74 feet below, with palms and large basins for aquatic plants. To either
side of the conservatory was a roof garden and a paved promenade for the
use of the employees.

While the provision of a restaurant was a common feature of
earlier office buildings, the uses housed in the four-story annex point
to the introduction of new features in the office program. Above the
entry lobby on the first floor and locker and rest rooms on the second,
the annex housed an infirmary and dispensary on the third floor, while
the fourth floor housed the headquarters for the Young Women's Christian
Association, a library,and a school. These uses point not only to the

progressive nature of the firm, but indicate as well the impact of the introduction of women into the office workforce. With the widespread use of the typewriter in the late 90's and the growth in the amount of information which needed to be processed, minor clerical duties were increasingly taken over by women.Their introduction into the office had an impact similar to that provoked by the earlier introduction of women as factory workers in places like Lowell, Mass. There the factory buildings,forming quadrangles around flower-lined courts, simulated a university campus,and women workers were encouraged to write uplifting essays for company sponsered newsletters. Similarly, in the office,various amenities were introduced to soften the image of the workplace.Leffingwell would point to certain methods useful in improving efficiency, among them the 'clearly demonstrated facts' that

> 1 Workers,especially girls,respond to the
>   inspiration of mottoes.
> 2 Flowers on the desk of an employee not only
>   improve the worker's frame of mind,but
>   actually increase output.
> 3 Music is not out of place in an office – an
>   occasional concert,even during work hours,
>   adds to the mental nimbleness of the
>   workers.[3]

Women,he wrote,were apt to respond to music in greater degree and he pointed to an office where a phonograph was used to good effect.

> It is used chiefly at noon and immediately before
> the day's work but sometimes,when a sudden rush
> of work has tensed the entire organization and
> errors due to high speed are becoming apparent,
> a soothing violin solo,or an old fashioned melody,
> will relieve the tension and get work back on
> a normal basis.[4]

Aside from the provision of a YWCA and an infirmary complete with resident nurse, the Larkin Company would later propose the provision of smocks for its women workers, to be laundered at the company's expense. As one author noted

> This will be intended to protect their gowns
> and to preserve the color scheme,for at
> present the.ensemble of blacks,reds,whites,
> and greens,while individually becoming most
> assuredly, is undeniably at variance with
> the color scheme of the interior. [5]

While the above was suggested by management and not by the architect, it does point to the degree to which all the elements of the building were incorporated into the total design. In his 1908 essay Wright had written that the most satisfactory buildings were those in which most or all of the furniture is built in as part of the original scheme of the building, and the Larkin Building provided him with an unsurpassed opportunity to do so. Beyond the designs for furniture and filing systems, all the apparatus for heating,ventilating,lighting, plumbing,inter-communication,and electricity were assimilated into the structure. The building,sealed against the outside atmosphere because of its proximity to neighboring factories and the railroad,received its air supply by drawing air from the top of the towers articulating the four corners of the building. Heated and washed in the basement,the air was delivered to each area through registers located in the hollow balcony fronts, and exhausted over the glass ceiling of the main court, where in winter it melted the snow falling on the outer skylight.Because of the lack of partitions,the electrical outlet boxes were embedded in the floors so that power could be easily supplied at any of the desks. Wright complained that he had not been responsible for the design of the telephones and the waste paper baskets,as they had already been con-tracted for, but he designed all the desks, chairs,filing cabinets,and lighting fixtures.(Artificial lighting was not necessary on clear days, as the tall floor to ceiling height of the galleries and the height of the windows combined with the illumination provided by the central skylight to insure that daylight would penetrate to all the working areas.) The desks, of steel and magnesite,were designed as a unit with the metal chairs, which were supported from one of the desk legs and thus swung free of the floor to allow for easy maintenance. The tops were interchangeable so that typewriter and graphophone desks might be introduced where needed. The filing cabinets, the first sectional steel cabinets to be used, were arranged on a unit system which was easily interchangeable. Unlike later modular furniture systems, which were placed in the shell provided by the building,in the Larkin these elements were either built in like those between the piers on the upper galleries, or, as freestanding units, defined the areas surrounding the central space on the ground floor. Wright wrote; "Little disorder and
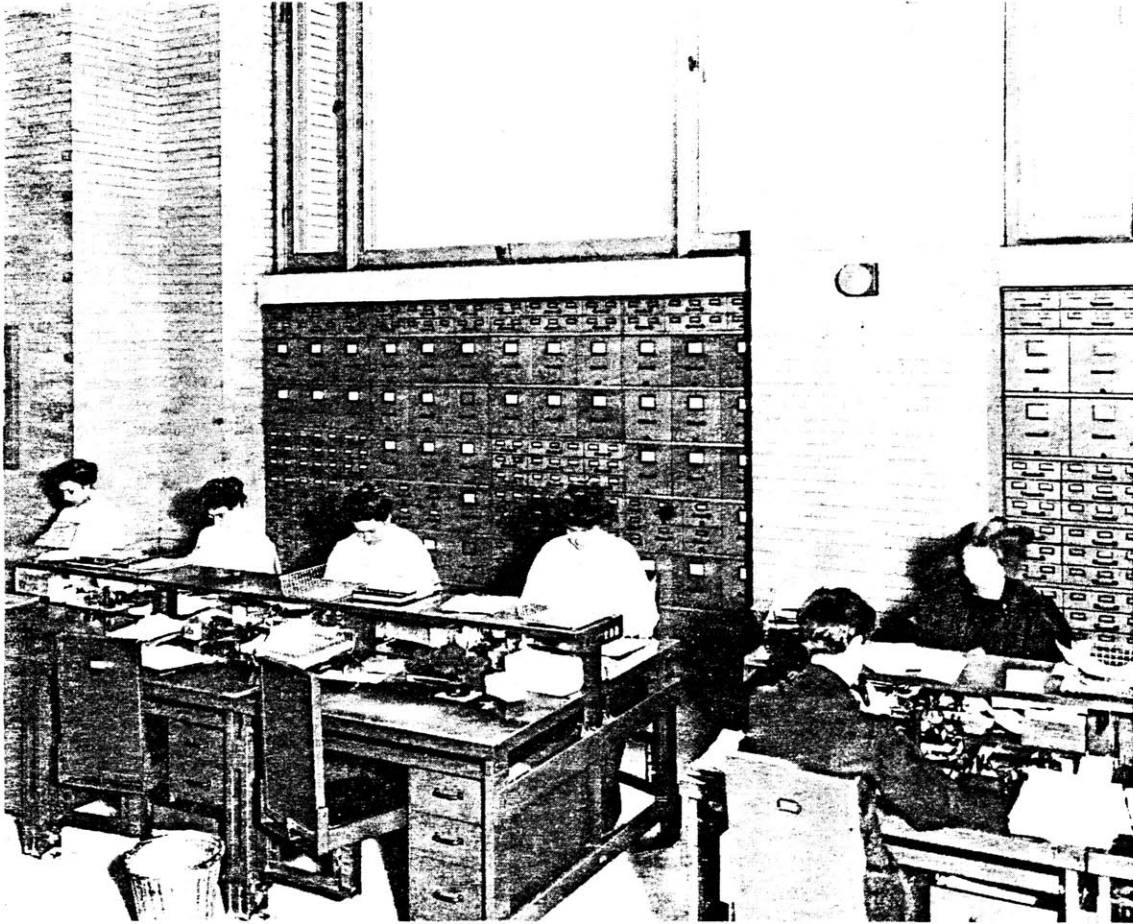
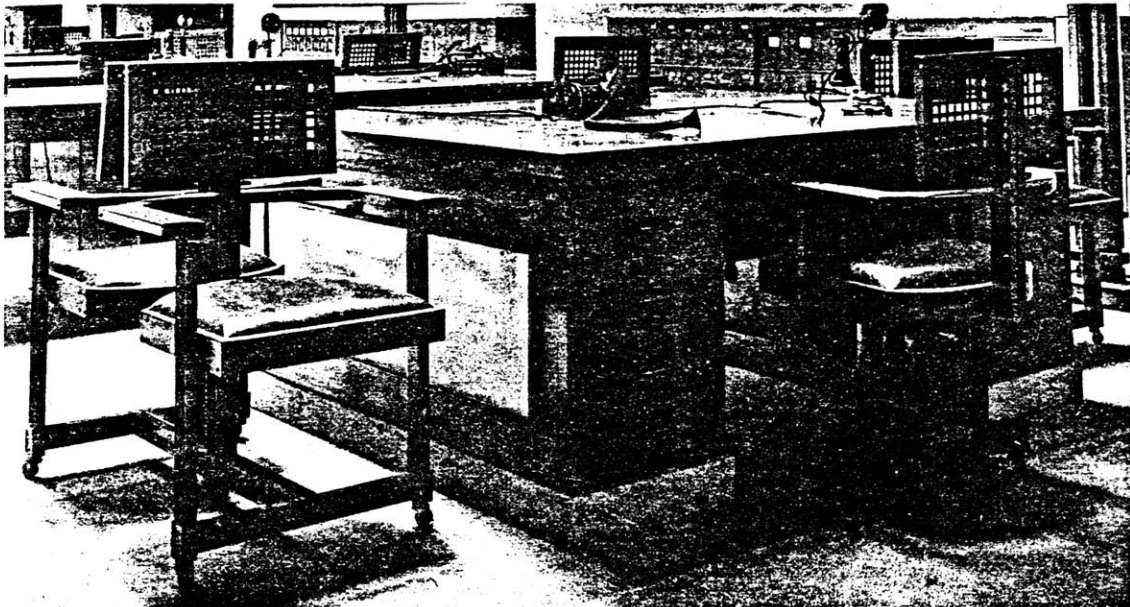fig.8　Typical arrangement of the upper floors showing the built-in files under window and the fold-away chairs

fig.9　Furniture in managers' area. Desks were of steel and magnesite

no confusion arose from the inauguration of the building,for the building is its own furnishing - or its furnishings a part of the building. Finished, it is complete and ready for use."[6]

Aside from the semi-partitions of glass,brick,and magnesite which separated the president's office from the other areas of the ground floor, there were no partitions in the building. In commenting on the building, Berlage noted; "The building consists of only one large room,thanks to the American concept that an office should not be divided into separate rooms."[7] But if the lack of private offices was typically American, the degree of openness achieved was characteristically Wrightian.Earlier office buildings,following the pattern of the London Exchanges,had arranged offices around a central top-lighted court - Lever House,in Port Sunlight,had used the central area thus defined as working space;but none had achieved the continuity between open galleries and central space found here. With the disposition of the smaller scale functions in the annex and the removal of the stair tower and service core to the exterior the space could be completely fluid around the central court. With its vertical piers rising uninterruptedly and interwoven with the recessed horizontal spandrels of the galleries,the interior of the Larkin evokes comparison with the exterior of Sullivan's Wainwright, but whereas the Wainwright, in Scully's words, is the "... expression of the fabric as a muscular,skeletal body",[8] in the Larkin, this fabric, opened up, is the container and definer of space. The organization of the building thus permitted the definition of smaller units while still allowing these to be perceived as part of an organic whole.

Manson has written of the Larkin that the organization and form of the building seems to have occurred to Wright at once. Why was this type of arrangement so intuitively clear? In describing the process of design that led to Unity Temple,Wright wrote that the first step was the investigation of the 'philosophy' of the building.Like the Japanese print maker who expressed not the literal appearance of a thing but its nature,the central problem for the architect who would avoid 'literature in any symbolic form' was to put the idea of the nature of a thing into appropriate form. These forms would only be true if they were born out of a recognition of the conditions of life,otherwise;
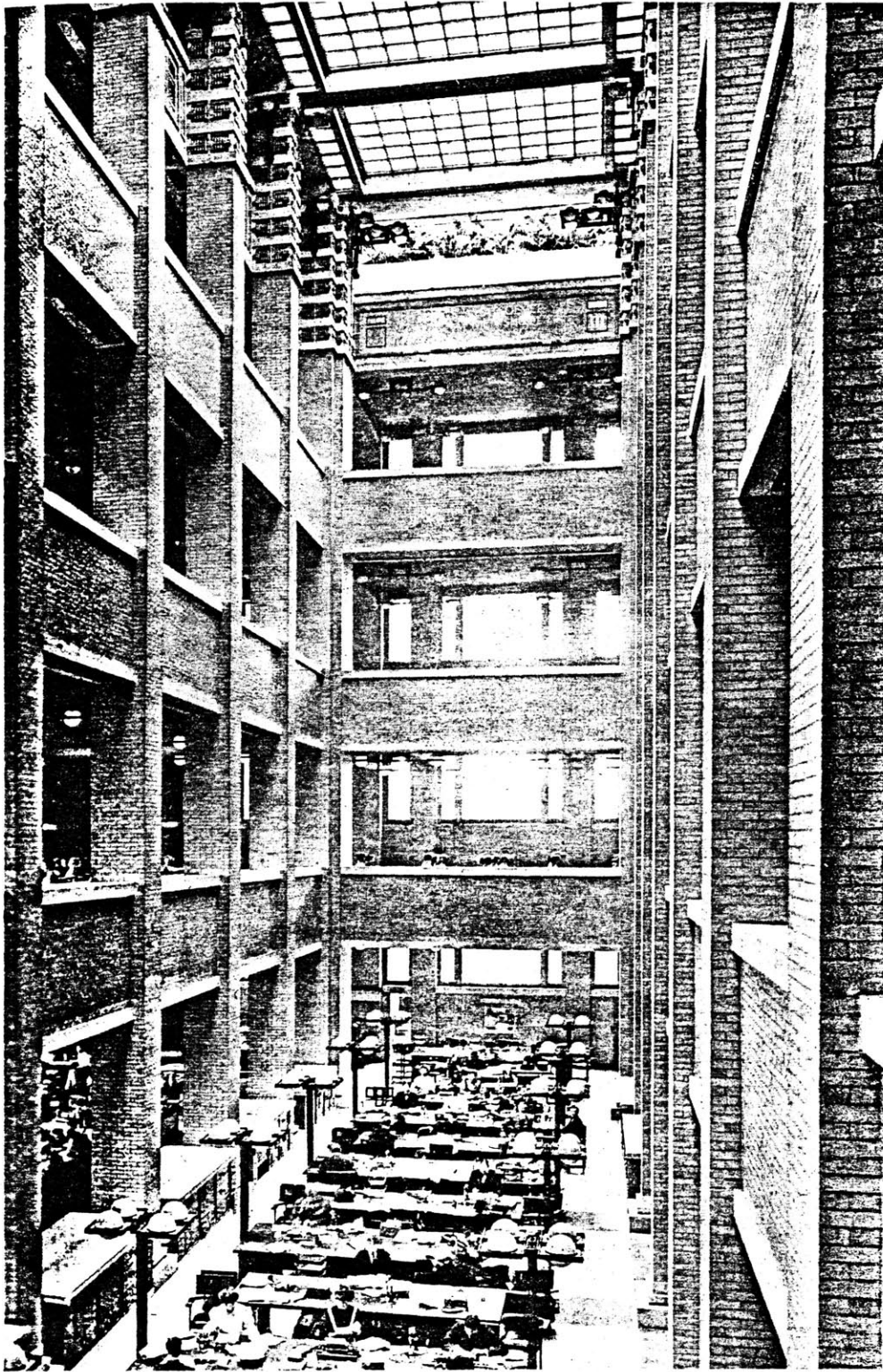
fig.10 View of central court

"... the best that tradition has to offer is only an inglorious mas-
querade,devoid of vital significance or true spiritual value."[9] In this
we find an echo of Sullivan,who wrote that at the higher level of
artistic expression it was necessary

> to animate buildings with a subjective significance
> and value,to make them visible parts of the social
> fabric,to infuse into them the true life of the
> people,to impart to them the best that is in the
> people,just as the eye of the poet,looking below
> the surface of life.sees the very best that is in
> the people.[10]

Above and beyond the provision of a well-planned and efficient
environment,the building would thus, as the framework for the human
life within it, "prophesy and idealize the character of the individual
it is fashioned to serve."[11]

To that degree Wright's vision of a social order was inseparable
from his architectural vision. Just as the artist 'conventionalizes'
natural forms, civilization would be a "right conventionalization of
our original state of nature."[12] The artist, by translating into
structure and form the essence of what it meant to be human and to
live with others,would be the prophet of that ideal state - a true
democracy which would be characterized by the highest possible expression
of the individual as a unit not inconsistent with a harmonious whole.
Without the essential heart of the artist, architecture would "degenerate
into a box merely to contain...objects it should itself create and
maintain."[13]

In his analysis of Wright's work, Norris Kelley Smith has focused
on the importance given by Wright to the organizational function and
ethical implications of the institutions for which he designed buildings.
In the expression of these institutions his work, eschewing the classical
search for a normative and medial tranquility,is built out of the
tensions between the individual and the collective, loyalty and freedom,
multiplicity and unity. Particularly in Wright's residential work, this
tension is manifested in Wright's attempt to formulate an image of the
family that would do justice both to the member's claim to individual
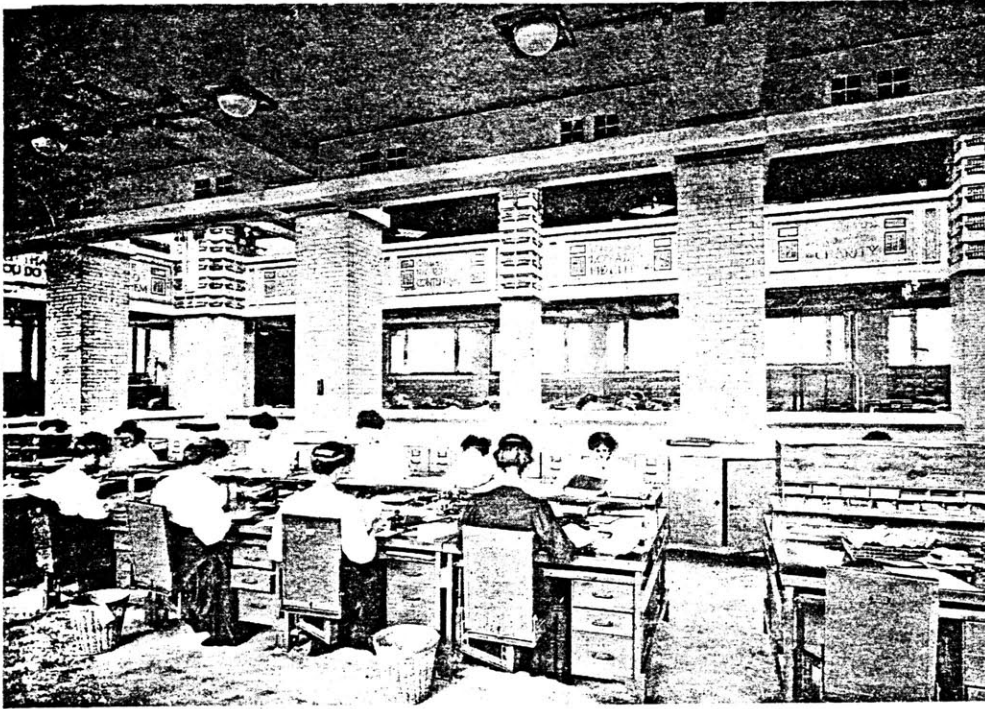freedom and the groups demand for order. Smith writes;

fig.11 Illustration showing 'familial' arrangement of seating

> His house designs till 1909 are distributed
> along a line that runs, as it were, from the
> front of the Winslow house to the back...At
> one extreme there is a formal and geometrical
> mode of relatedness which is associated with
> institutional order,with stability, and with
> the submission of parts to a clearly defined
> whole,and at the other, a casual and irregular
> mode which connotes personal freedom and the
> repudiation of institutional conformity.[14]

Wright often used the metaphor of the family in describing the
Larkin Building. Of this 'house-room for a great business family' he
wrote; "The superimposed stories,lighted and unified by a long open
skylighted central court,preserve in the occupation of the interior the
character of the family gathering."[15]

In most offices, as we have seen, workers faced in one direction.
In the Larkin Building, the desks were designed so that workers sat
facing each other on opposite sides of the table. There is, then, in
the seating arrangements, a strong reference to the family activity
of dining. In the geometrical formality of the Larkin, as well,there

is a connection to the dining areas of Wright's residential work, where, as Smith notes,the severely rectilinear furniture set within a rectilinear context "declares unequivocally that the unity of the group requires submission and uniformity on the part of its members."[16] In his early houses, Wright consistently treats the occasion of dining almost as if it were liturgical in nature, and in the Larkin as well, where the powerful simplicity of the inner court expresses the nature of community in a simple and immediately comprehensible diagram, the image which immediately comes to mind is that of a church. The nave like quality of the central space is further emphasized by the nature of the inscriptions on the upper gallery (Ask and it shall be given you, seek and ye shall find) - to that degree the organ which the management later installed in the upper gallery seemed not at all out of place. The blending of these ideas of workplace,home, and church was made explicit by Wright in discussing his later design for the office building for Johnson's Wax. "I wanted to make the building as beautiful to live in and work in as any cathedral ever was to worship in."[17]

The equation of work and worship has, of course,a long history in Western thought. In the Protestant conception, all work is endowed with virtue. Luther had written, "A housemaid who does her work is no further away from God than the priest in his pulpit." Carlyle, with his conception of man as homo faber, wrote; "Older than all preached Gospels was this unpreached, inarticulate but ineradicable,forever-enduring Gospel : Work, and therein well-being."

Across the bottom of an elevation drawing of the Larkin Building, Wright had written "The Grammar of the Protestant", but what he referred to was not only this endowment of work with a moral significance, but also to the manner in which his expression of this protested the 'meaningless elaboration' sweeping the country under the imprimatur of the acknowledged styles. While 'Fra Elbertus' would stress the sacredness of work by a return to handicraft, for Wright, man would find the natural place due him only by fully recognizing the conditions of his time.
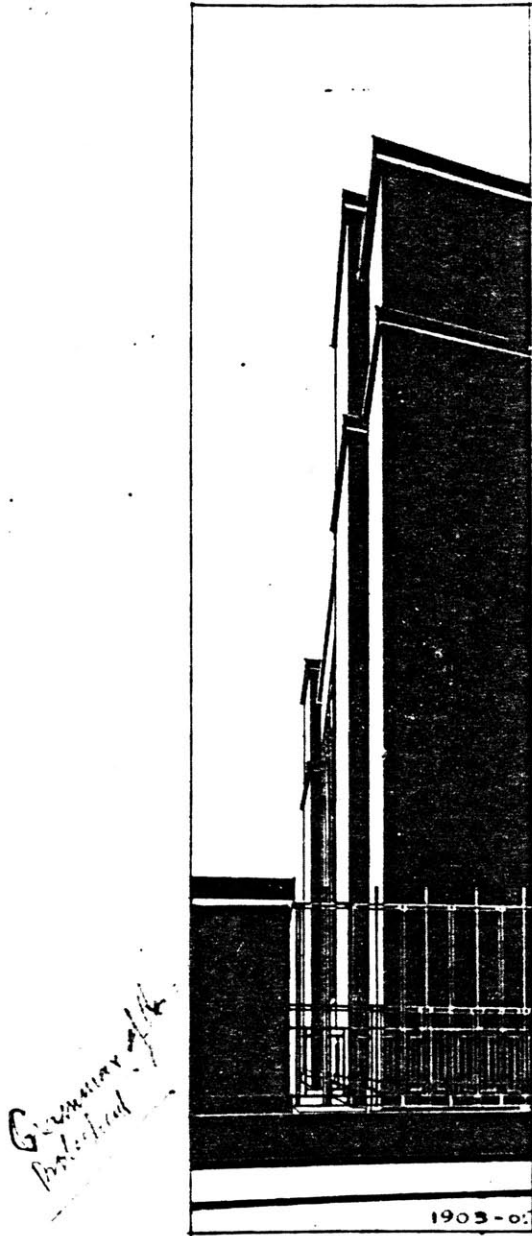
fig.12 Exterior perspective.Inscription reads "Grammar of the Protestant"

The character and brutal power as well as the
opportunity for beauty of our own age were
coming clear to me. In fact I saw then as now
that they are all one. I saw our own great
chance in this sense still going to waste on
every side. Rebellious and Protestant as I was
myself when the Larkin Building came from me, I
was consious also that the only way to succeed,
either as rebel or as protestant,was to make
architecture a genuine and constructive affirma-
tion of the new order of this Machine Age.[18]

The exterior of the building housing ' this commercial engine'
exemplified this brutal power. "In terms of the straight line and flat
plane the Larkin Administration Building is a genuine expression of
power directly applied to purpose, in the same sense that the ocean
liner,the plane,or the car is so."[19]

Scully has contrasted the humanistic image of Sullivan's Guaranty
building with the clifflike severity of the Larkin - "...a monument
of the machine age, a rationalistic engine."[20] But if Wright had broken
away from craftsmanship, it was with a view of the machine not as a
neutral fact which the architect was compelled to express, but rather
as a tool which would allow man to find his natural place "in this
great piece of architecture we call the social state."[21]

Speaking of the power of the machine as the conventionalizing
agent which would civilize the natural man,Wright wrote in "The
Art and Craft of the Machine"

Grasp and use the power of scientific automotons
in this creative sense and their terrible forces
are not antagonistic to any fine individualistic
quality in man. He will find their collective
mechanistic forces capable of bringing to the
individual a more adequate life, and the outward
expression of the inner man as seen in his environ-
ment will be a genuine revelation of his inner life
and higher purpose. [22]

In this revelation, the artist played an important role -
for it was through his inspiration that the life principle in men
would achieve its expression. By postulating the existence of an
ideal - a voluntary association of men sharing common goals and concerns -
and by allowing the individual to have an active role in the shaping of
that ideal - Wright was able to transcend a determinist and merely
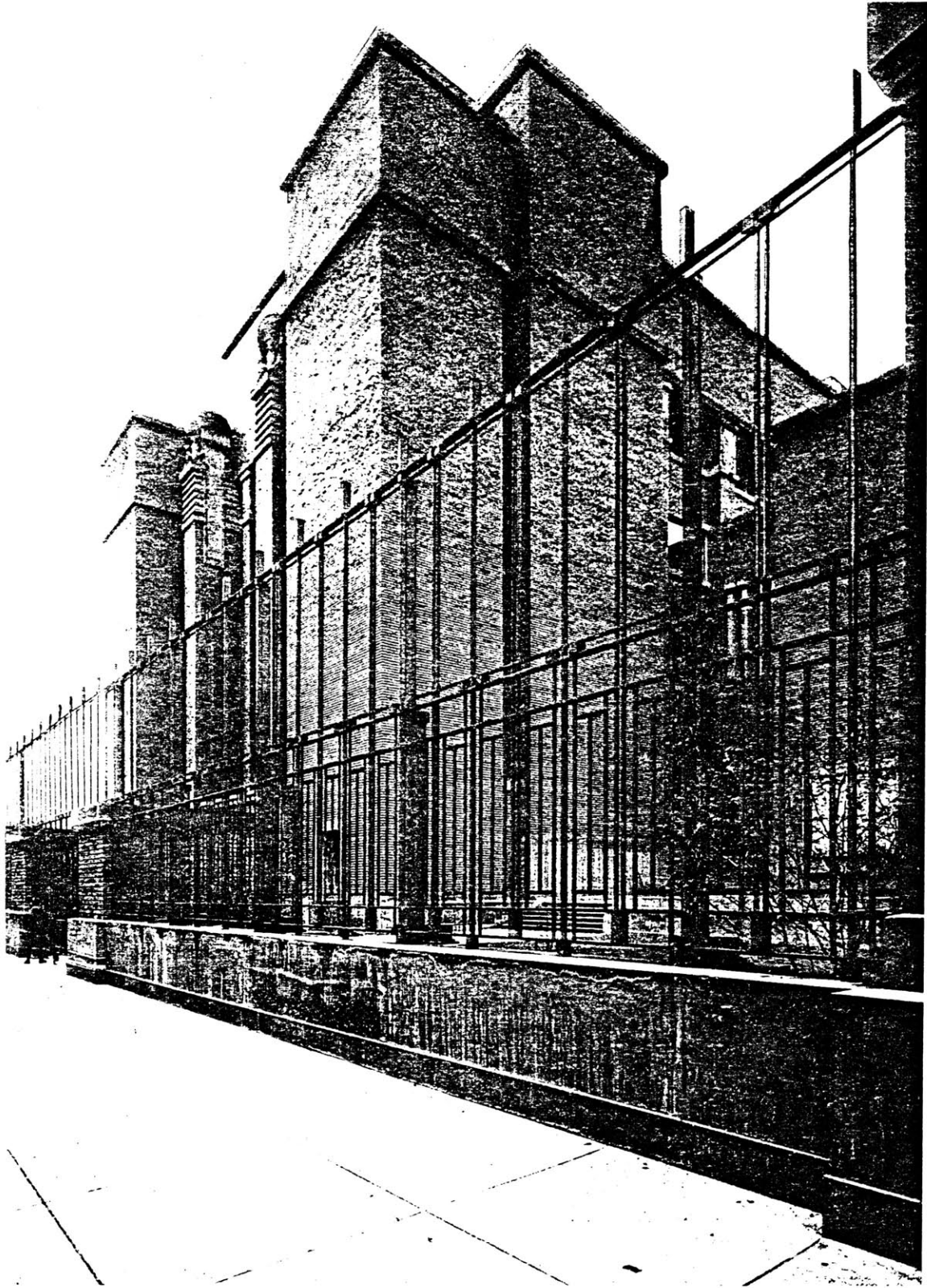rational equation between architecture and technology.

fig.13 Exterior "A monument of the Machine Age"

This alliance between the will of the individual and the power
of the machine in the creation of a cooperative commonwealth was, in
fact, the ethical and optimistic basis for much of the progressive thought
of the period. As Turner had earlier seen the frontier as stripping the
innately perfect man of his institutional 'baggage', thinkers of the early
decades of the century like Thorstein Veblen, Charles Cooley, and James
Mark Baldwin saw industrialization as being a force which would remove
from man the burden of tradition, and allow a natural society to appear
again. Rejecting the Spencerian view of natural selection which emphasized
the importance of competition, they argued instead that the basic human
personality was one formed by the adaptation of cooperative traits.While
science was revealing the outlines of the progress toward the return of
the natural 'social' man, that progress depended upon whether man willed
and created a world that would fulfill this destiny. In this mediation
between fact and value, man's imagination would create the world. By
means of this aesthetic union, the individual would find his place in
an organic whole. The sociologist Cooley wrote; "I would like to make
a connecting link between science and poetry, to show the pressing
facts of human life as members of an ideal and beautiful whole."[23]
Veblen saw his time as being characterized by the opposition of two
great forces, competitive business on the one hand and Christianity on
the other. One represented a phase of western civilization, the other
represented the essence of it. One was dying, the other, aided by the
machine process with its emphasis on the 'savage' instincts of
workmanship and idle curiosity, was growing stronger.

In the postulation of a perfect human nature which would reach
full expression through the new forms of industrialization, Wright
shared the optimism of the time. Progress, paradoxically, was a return
to a natural man made possible by the machine.To that degree Wright's
metaphor in the Larkin does not look backward but rather projects
forward. Beyond the provision of a comfortable working environment,
in its organization and imagery it evokes the image of a group working
together harmoniously in the pursuit of common goals.

Progressive ideas which presumed the inevitability of progress
collapsed in the face of World War 1, and, to a degree, the metaphor
through which Wright expressed the nature of the working group was

fig.14   Illustration from Leffingwell's
         "Making the Office Pay"
         showing the increased density
         by 1917

equally as fragile. Pictures of the interior of the building ten
years after its completion show that with the firms expansion more
and more workers are squeezed into the gallery spaces.While Wright
had seen the space as a metaphor for an organic unity, an article
on the building in an early issue of "Business Man's Magazine" is
subtitled ; "How system and appointment make the handling of over
one thousand employees as easily (sic) as directing the work of one
person."[24] The author ends his article with a somewhat chilling metaphor.

> From a spot on the sixth floor of this magnificent
> building called by an employee 'inspiration point',
> there is stretched before one a scene unlike any
> other in the world. Directly in front are the
> dignified capitals surmounting the columns of the
> central court. On the floor areas below and in the
> main court hundreds of people busily transacting
> the affairs of this great institution are in plain
> view. One is reminded of nothing so much as of a
> mammoth watch. There are the departments, each
> steadily,quietly,rotating about its own axis,yet
> in perfect coordination with the rest, and each so
> delicately meshed to its neighbor that one helps
> the other and in no way interrupts its progress. It
> is enterprise, American enterprise,that drives the
> wheels,carefully organized systems and methods are
> the jewel bearings; good will, the lubricant. [25]

In this alternate reading of the building, one is reminded of Foucault's comment, in a discussion of the relationship between power and spatial organization, that Godin's Familistere could as easily have been used as a prison. [26] Wright would later, in speaking of his proposal for an ideal community, recognize this disjuncture between his ideals and the reality of the social world."I don't think Broadacre City would be fit for humans that have been more or less degraded by the circumstances in which they now live. Something would have to be done for them while they last. Some preparation for their end." [27]

In the Larkin Building, then, we find the architectural expression of the workplace as a gathering place for people with common interests and goals.Working with this image, Wright created an environment where each part was clearly related to the totality of the building.At the same time, the individuality and territoriality of individual workers was sacrificed to this presumed harmony. The seating arrangement,with workers directly facing each other,might have been appropriate to a small family gathering,but it would surely have been uncomfortable to maintain for a long working day. In the optimistic faith that the group would recognize the rights of its members,Wright had celebrated the unity of that group.In the process, individual needs for territorial definition and control had been sacrificed.As the unity he idealized became more and more questionable,a new manner of spatially reinforcing the autonomy of the individual became an important issues. But attention was shifted to other concerns - the Larkin Building was demolished in 1950 and the problems it raised were not to be readdressed for many years.
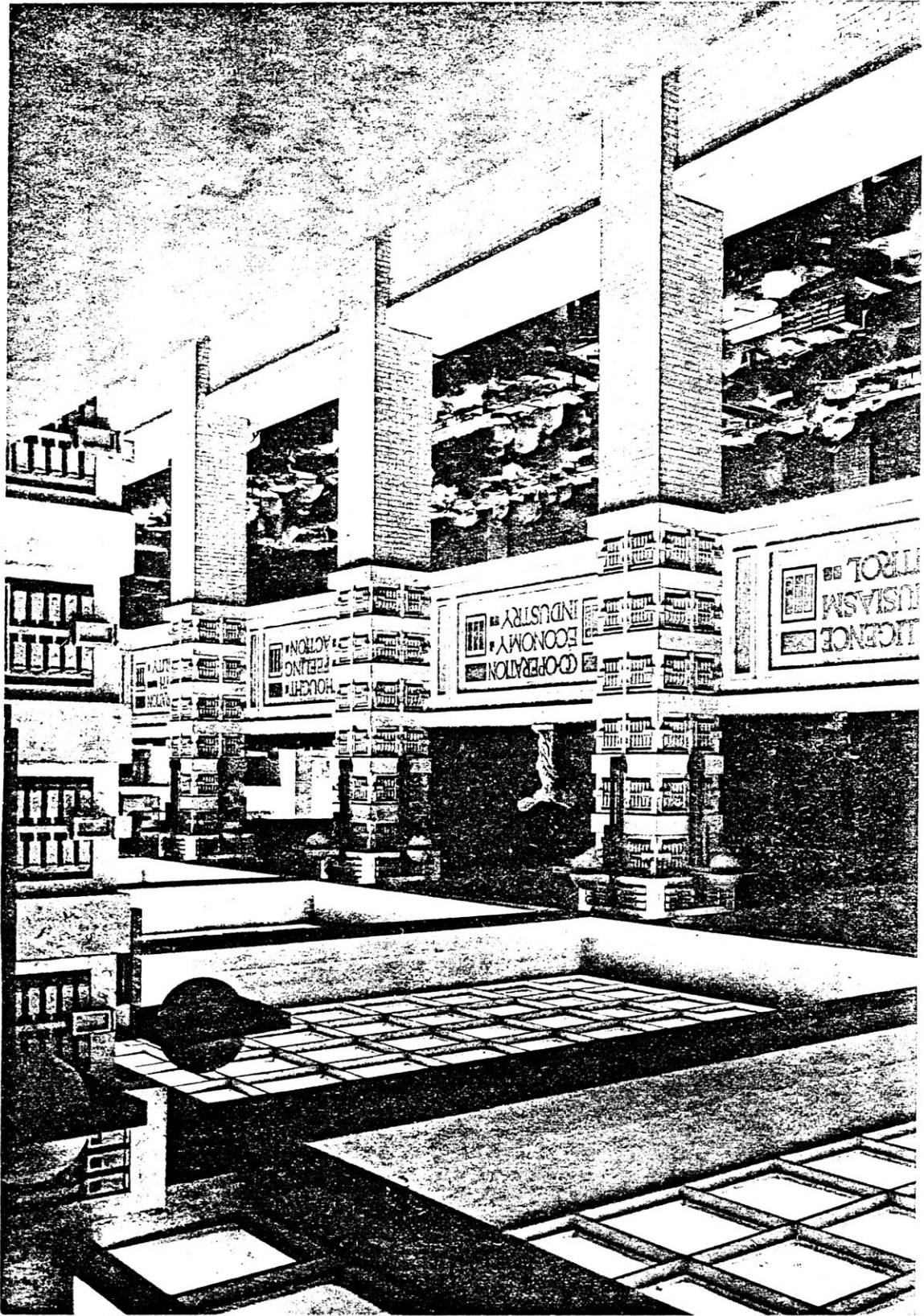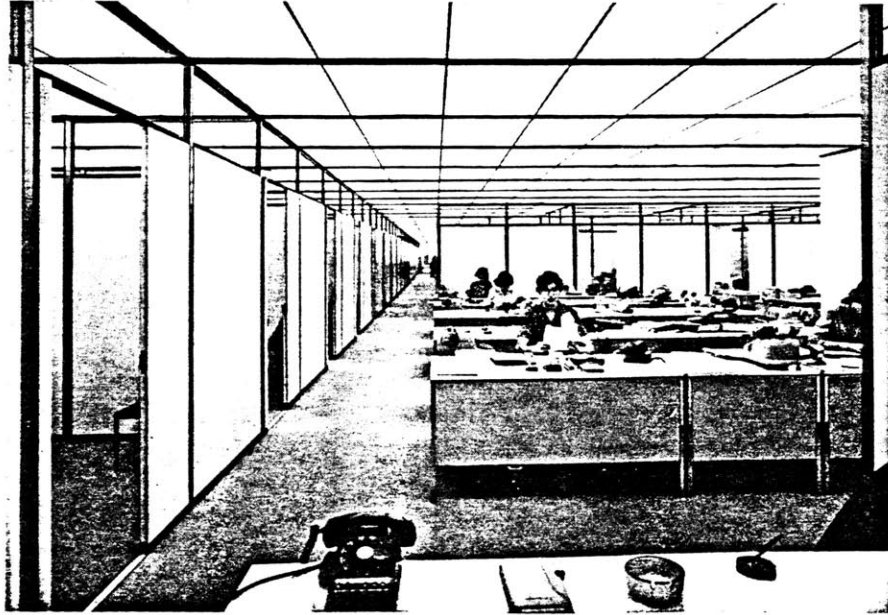
THE MODERN OFFICE
1930 - 1980

The same year that the Larkin Building was torn down to accommodate a truck-storage garage saw the third printing of Leffingwell's book Scientific Office Management. It's editor wrote; "Since Mr. Leffingwell's principles of scientific office management were published in 1921, they have been reproduced and referred to year after year without change."[1] To what degree did the ideas of the early Taylorists continue to influence the layout of the office ? Certainly the 'look' of the office building was changing. In 1932 the PSFS building rose in Philadelphia, providing one of the earliest American examples of the aesthetic of modern sky-scraper design. Management theories, as well, were changing in some respects. While the PSFS building was being designed, Elton Mayo and his colleagues at Harvard's Department of Industrial Research were conducting experiments at the Hawthorne works of the Western Electric Company in Chicago. The experiments, perhaps the most painstaking of their kind in the history of the social sciences, attempted to correlate worker productivity with conditions of the work environment. For periods of thirteen weeks at a time, one factor - the amount of heat, degree of light, hours of work, numbers of rest breaks - was changed while all others were kept constant. A skilled statistician spent several years trying to relate variations in the physical circumstances of the oper-ators being studied to their amount of output. With every change made, however, whether a decrease in illumination, longer hours of work, or fewer rest breaks, the productivity of the workers kept increasing. The researchers concluded that the subjects of the experiment were responding, not to any of the physical variables, but to the interest and attention focused on them. The experiment itself, not any outside factor, was seen as the most important variable.

The 'human relations' school which developed from these studies tended to discount the importance to productivity of the physical work environment. In the absence of any evidence supporting a link between productivity and environment the older patterns of spatial layout continued to operate. The possibility that the variety introduced

fig.1 Typical office of the 30's

by the experiment, as well as the attention generated by being test subjects, might have had some effect on worker morale, was ignored for many years.

Aside from the large projects of PSFS and Rockefeller Center, the 30's and 40's saw little office construction. The 20's had been a period of overbuilding of office space, and with the depression and the shrinking of clerical staffs, the average commercial building was fortunate if it had 75% occupancy. There was, if anything, more concern than ever for efficiency as opposed to any interest in worker satisfaction. Significantly, the office manual which appeared in 1931, in contrast to the more dignified earlier titles of The American Office, or Scientific Office Management, was entitled Cutting Clerical Costs. The author of a 1930 article in Architectural Forum on the renovation of older office buildings noted the decline in space standards. Whereas 110 sq. ft. was formerly considered the average space required per capita (including circulation), efficient open planning without the use of partitions would now accommodate one worker in 65 sq. ft. of space.

In contrast to the lull in building activity which preceded the war, the period after the war saw an unprecedented amount of building. In Manhattan alone, the fourteen year period ending in 1960 saw the completion of 110 office buildings, providing nearly 32 million square feet of rentable area. One of the earliest office buildings of the period was SOM's Lever House, designed in 1952. Mumford, captivated by the building, rhapsodized about the color coordinated interiors - from the dark beige uniforms of the elevator boys to the 'boudoir pink and eyeshadow lavender' of the floor devoted to the firm's cosmetics. He wrote that, for the people lining up to view its interior, the building seemed to be 'the eighth wonder of the world', and suggested that, if not for its hepatic sound, the word 'Leverish' might well take the place of 'ritzy' as a synonym for the last word in luxury. The provision of public space on the ground floor was seen as a major innovation in terms of urban planning, but to what degree had the spatial layout of the offices changed from the pre-war models? In a conscious or unconscious reference to the 'bullpen' Mumford wrote; "Just as a sensible farmer designs his cow stalls around his cow, the fundamental unit around which Lever House's hundred and thirty thousand square feet of floor space was designed was the desk."[1] But views of the interior show that, in fact, the furniture and the way in which it is laid out is not significantly different from a model that would have been approved by the earliest 'scientific' manager. There is somewhat more space per worker than in the crowded offices of the 30's, but aside from the continuous window band and the banks of fluorescent lights in the ceiling, the offices of Lever House are indistinguishable from their pre-War predecessors. The pattern of open space for the clerical workers and private offices for the executives is unchanged. The desks are shared by two workers and are neatly aligned in a grid constructed at right angles to the window wall which accommodates, in the shorter dimension, seven work stations interrupted by two aisles. Studies had been conducted in the late 40's which led to the development of an L-shaped work station, but, in general, such arrangements were reserved for executive use.

Following the pattern set by Belluschi's Equitable Building in Portland of 1948, Lever House is completely sealed from the outside. Like the earlier building it is also a slab - the shaft is less than
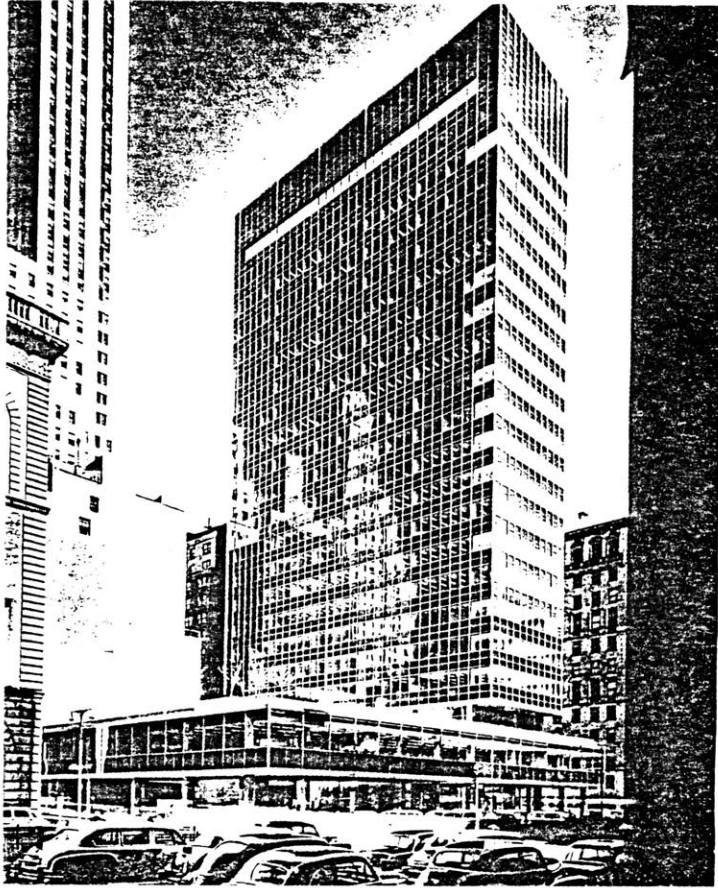
fig.2   Lever House, New York (1952) exterior

fig.3   Lever House, typical office interior

60' wide and few desks are more than 25' away from the continuous
windows. The fluorescent lights introduced after the war, with their
more efficient energy usage,made the idea of a totally conditioned
deep space possible - but the earliest post-war buildings continued
to be influenced by perceived needs for daylight and view. Wallace
Harrison, in his 1950 essay on office buildings, noted that an office
with unobstructed daylight and a view netted from 40-400% more revenue
than a similar office layout dependent on artificial light.

But even at Lever House, where the high ratio of perimeter to
floor area might have suggested a greater reliance on natural lighting,
photos show that all the fluorescents, even those which extend to
within a foot of the window wall, are on, regardless of the amount of
daylight pouring in through the windows. Centrally controlled, there
was no way to vary local conditions according to need. With the
increasing acceptance of artificial lighting, the 'wedding cake' buildings
of firms like Emery Roth & Sons soon began to take advantage of the
financial possibilities of covering the entire lot with building up to
12 or more stories before stepping back. Immediately after the war, air
conditioning had been a feature offered by some office buildings - by
1960 it had become a required standard.

Lighting standards continued to increase and the variety which had
resulted from the careful sheperding of natural light in the past was
destroyed by the search for a uniform and contrastless light. Office
planners in the 20's had called for 10 footcandles for office work.
Harrison in 1950 put the recommended level at 30 footcandles. But
when the Illuminating Engineering Society made recommendations for
lighting levels in 1958, the standards rose to 100 footcandles for
regular office work and 200 footcandles for tasks like drafting - levels
that had been considered appropriate for hospital operating theaters
in the 20's. Not only was it considered necessary to provide such
high illumination levels, but the quality of light was to be absolutely
uniform. Joedicke wrote in 1959; "It is not enough merely to ensure
sufficient intensity of illumination but also to obtain uniform
illumination of the room."[2] The demand for uniform light levels led
to the introduction of the luminous ceilings of the 60's, where the
entire ceiling becomes a diffuse light source.

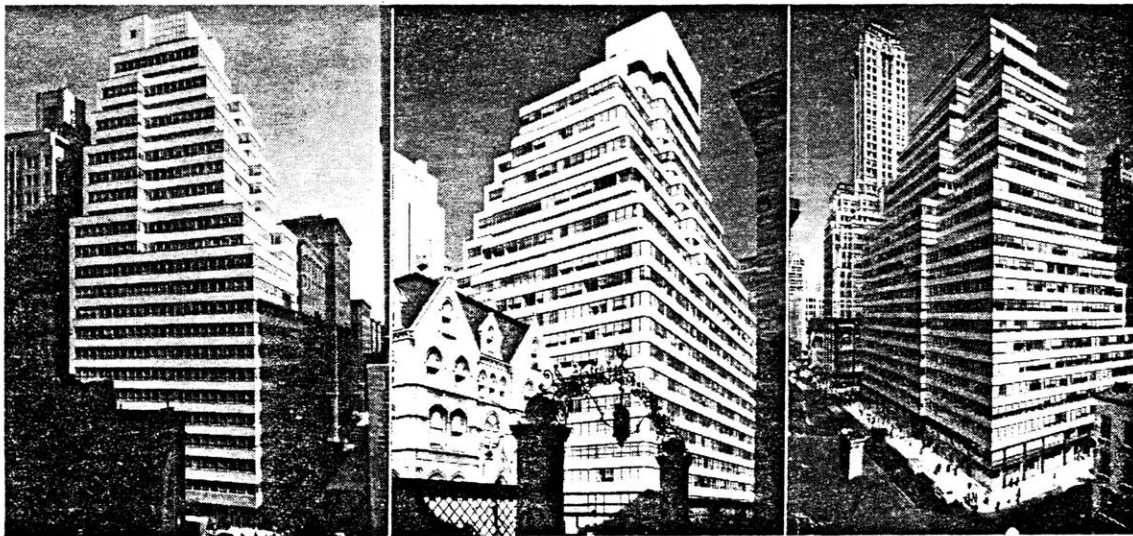fig.4   Equitable Building,Portland (1948)

fig.5 Office buildings, New York, Emery Roth & Sons, c.1955

One wonders whether the deep spaces made possible by developments in lighting and air conditioning would have been adopted if the open plan had not become such a standard feature of the American office. In Europe, where the pattern of private offices entered from corridors continued to be the norm, the office building continued to take the form of the slab. The reluctance to adopt the 'American' plan of open offices in deep plan spaces might have been the result, not only of higher energy costs in Europe, but also of different cultural expectations about the nature of the workplace. At a conference held in 1962 one rather aggrieved German planner,envious of the economic benefits of the 'American' plan, had this to say of his countrymen; "The German clerk claims to be an individual worker or at least pretends to be. To satisfy this preconceived idea which has become a sort of sacred tradition, he feels that only individual office space, or at most a small office with only a few additional working spaces, gives a satisfactory answer."[3]

But in America the open plan was well established, and with the increase in office building activity, the professionals involved in its design now included not only the space planner and the architect but also the interior designer. The promotion of visual order which had been recommended by Leffingwell, Galloway, et.al. as as mark of organizational efficiency, now was the province of a separate discipline; a discipline which was subject to the same concern for order and 'rationality' that characterized so much architectural thinking of the time. Thus, as one author notes, the offices of the Seagram Company are 'carefully designed to match the building',[4] and photographs of interiors of the period show a fondness for the aesthetic alignment of pencils on desks. In 1959 Interiors magazine published its first book on office design; in the four or five years prior to its publication the magazine had begun to devote more attention to the field. One of the buildings showcased in the book was the one designed for Conneticut General in Hartford by SOM in 1954. The office spaces of Conneticut General were designed to accommodate the 2000 employees of the firm with expansion possibilities for another 1000.The 3 story main building wraps around four interior courts designed by Noguchi. In the hopes of luring and keeping employees, a wide range of amenities was provided -
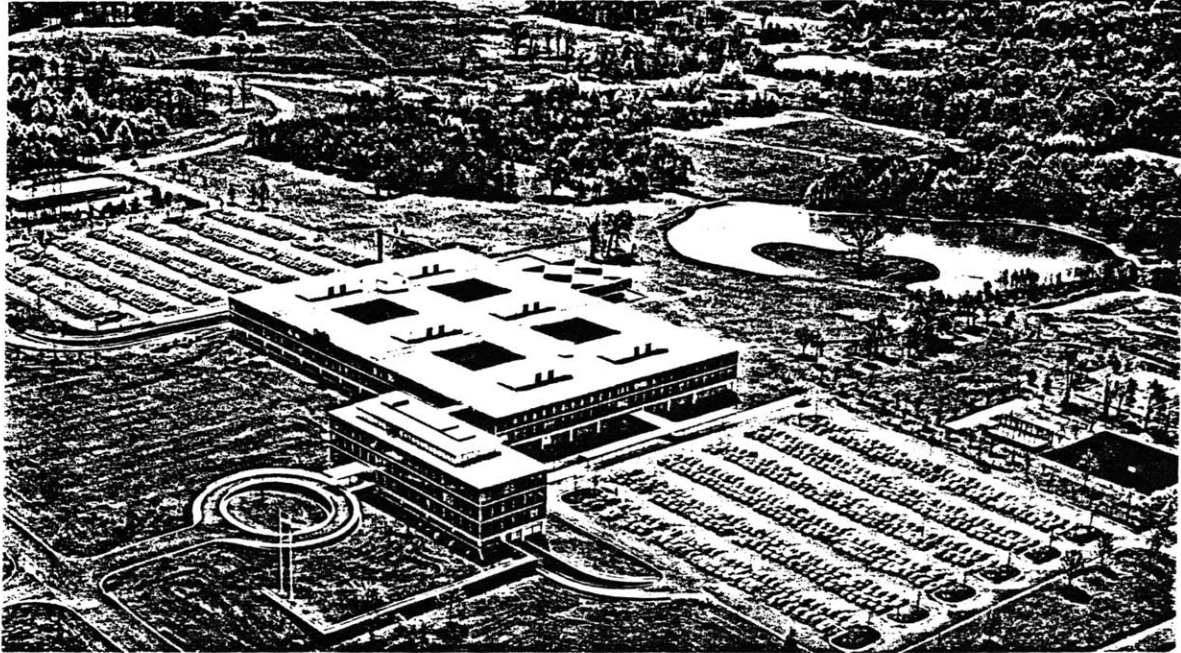
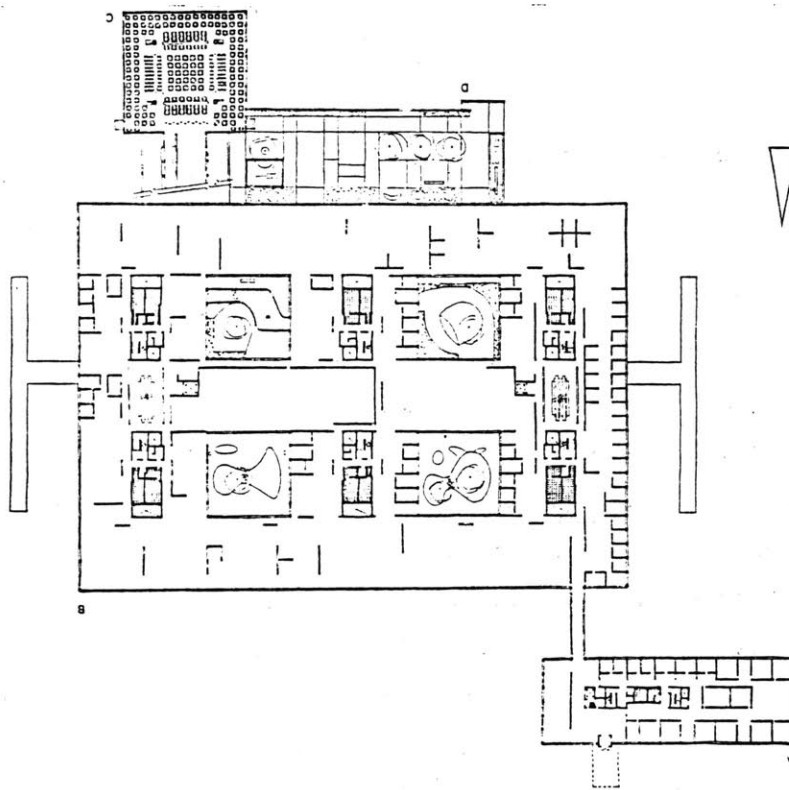fig.6   Conneticut General Headquarters,Hartford (1954)

fig.7   Conneticut General, first floor plan

from the company restaurant overlooking a reflecting pool to bowling
alleys and beauty shops. But as we have seen earlier the provision of a
wide range of amenities was not uncommon in the suburban office buildings
of the 30's. What was new in Conneticut General was the amount of research
that went into the development of new materials and the concern with
the coordination of structural and mechanical modules in the creation
of an orderly pattern that would allow for rearrangement of the space.
Conneticut General hired a professor of building construction at MIT
as a consultant in the development of the glass and aluminum curtain
wall, which was developed after a year of study. A 6 foot module was
used throughout the building with a ceiling grid that accommodated
lighting, acoustical control, ventilation, sprinklers, and the structure
for movable partitions that could be placed in either direction. While
the necessity to coordinate sizes of offices with the structural
dimensions of the office building had led to an early concern with
modularity in the office program, the introduction of large scale lighting
and air conditioning systems made the issue even more important. While
the desk arrangement at Conneticut General was somewhat less rigid than
that at Lever House, the presence of an overall logical pattern that
supersedes local conditions was the paradigm for the office in the
'classical' manner. Largely the work of Gordon Bunshaft and Florence
Knoll, the office spaces, with their careful detailing, were perhaps the
purest example of the Miesian aesthetic applied to office space. The
metal and glass partitions used there became more common as devices for
defining work areas,with more sophisticated models including provision
for carrying electrical and communication wiring. One writer spoke
approvingly of the 'museum-like' quality of the Conneticut General
offices, and the 'look but don't touch' aesthetic continued to be
admired by the designers, if not the users, of offices in the 50's and
60's.

The same year that Conneticut General was completed, William
Hewitt, the chairman of Deere, Inc.,commissioned Eero Saarinen to design
his company's headquarters in Moline, Ill. The process of design
extended over a 7 year period, with the architect and his client
collaborating on everything from the selection of the site to the
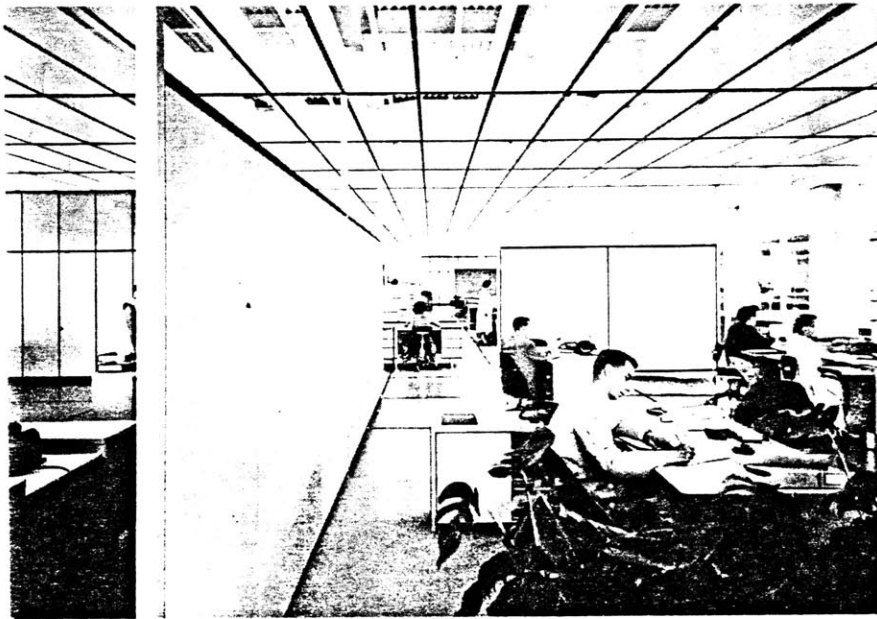design of the sugar packets to be used in the employee restaurant.

fig.8&9 Conneticut General,typical office interiors

Saarinen, writing that the building should not only provide functional, efficient space which could accommodate change, but should also express the nature of the company, produced as his first design a building in the shape of an inverted pyramid which was to sit on top of a hill! After some discussion with Hewitt, the final design emerged - a 7 story building sheathed in glass and Cor-Ten steel which spanned across a slight depression in the site. The module used in the building is 3' x 6' - all partitions are placed along a line determined by these dimensions, and the private offices are either 9' x 12',12' x 12', or 12' x 18'. Except for the executive floor, where perimeter offices for the upper level management enclose a central open area for the secre- tarial staff, the office spaces arrange the clerical workers on the perimeter around a core of glazed offices in the center for the middle level management;inverting the more typical arrangement of clerical workers to management up to that time.

Mildred and Edward Hall had, in 1964,begun a study investigating employee response to the building through a series of interviews that spanned a period of 5 years. The Halls were as enthusiastic about the Deere building as Mumford had been earlier about Lever House, calling it a crystal palace that looked as if "...a genie had transported it intact from the hidden valley of a Japanese emperor." [5] Most of the employee reaction was favorable as well, with workers impressed by the amount of attention the building was receiving and somewhat in awe of the building's 'elegance'. Complaints that were made related to the lack of physical privacy,the feeling of always being on display, as well as the inability to personalize one's workplace. The large glass areas offered practically no privacy - most people were clearly visible to a number of others all day long. Management had adopted strict regula- tions preventing people from putting up pictures,photographs,maps, charts,etc. They saw this as an effort to preserve the 'purity of design' by keeping out any 'Mickey Mouse touches'. Workers had to clean everything off their desks before leaving work each day. One person told the Halls; "When I leave my office at night, there is nothing left of me in it."[6] The Halls' suggested solution to the lack of color and personal express- ion in the office spaces was the institution of an art lending library where employees could borrow art and display it near their own desks
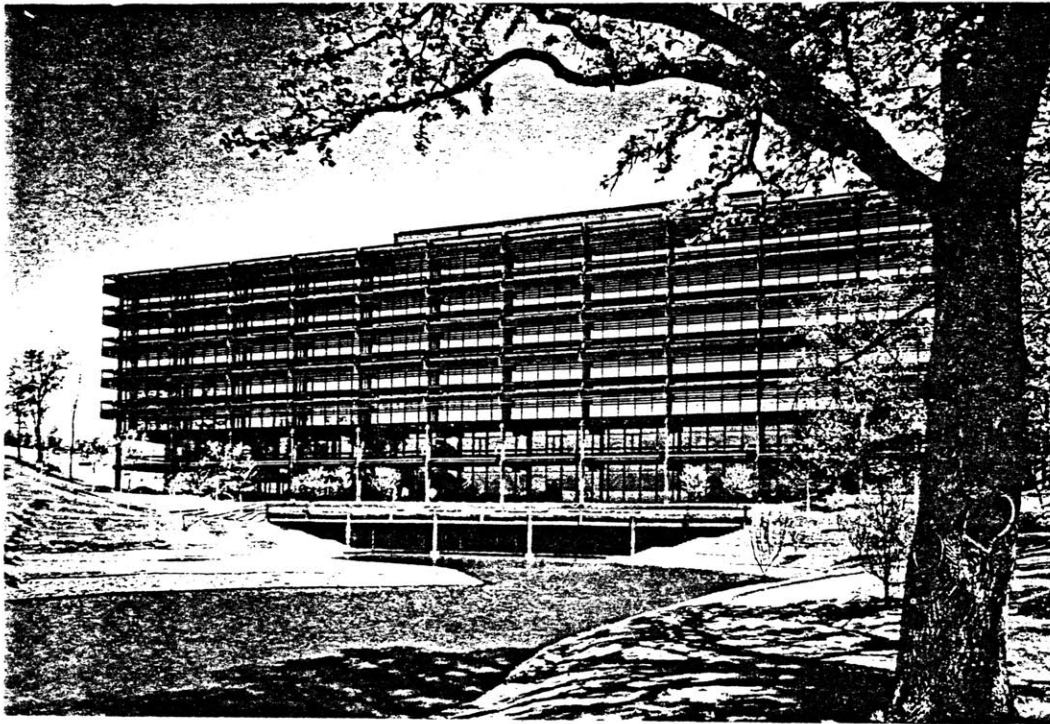
fig.10   Deere Inc.Headquarters,Moline

fig.11   Deere Inc.,typical office interior

or work areas. (Presumably this would ensure a certain level of 'quality' in the individual's display of self!) A number of employees expressed the feeling that the building was 'tiring'. There was no provision for informal places to gather or take coffee breaks • the lunch period was a half-hour long, which provided little opportunity for socializing. In order to prevent the windows from fogging, the humidity was kept very low, resulting in an extreme dryness in the air. This dryness, combining with the cold effect produced by the luminous fluorescent ceiling, might have produced a kind of tension in the atmosphere that would account for a higher level of fatigue.

The offices of Lever House, Conneticut General, and Deere Inc, represent certain general trends in office design during the 50's and 60's. Attention is focused on research into materials and the coordination of mechanical and partitioning systems. As artificial systems for lighting and air conditioning became increasingly relied upon, individual control and local variation of environmental conditions are sacrificed. In the case of the luminous ceiling, not only does the homogeneity of light have no relationship to the social spaces it serves, but it has been shown that, even on the level of efficiency which justified its adoption, such systems do not work.A British authority on lighting,Hopkinson, discovered that small bright light sources distract the attention less than large areas which are less bright - thus local lighting over a work table allows the worker to pay more attention to his work than unifrom background illumination would. In terms of plan arrangements, although there is some thought given to different types of layout (Deere Inc.'s reversal of the typical clerical-management positions), in general rectilinear arrangements prevail and enclosure is always sacrificed to perceptions about the importance of flexibility.

In the quest for flexibility, office planners often mentioned the superiority of clear space unobstructed by columns. In fact, significant jumps in the sizes of structural spans did not occur until the late 50's. Belluschi's Equitable Building of 1948 has bays of 18' x 20',while Seagram and Lever House have bays of 28' x 28' - not significantly larger than the standard dimensions in the 30's. In 1958, with SOM's Inland Steel Building, the columns are moved to the exterior wall of the building and the floors span between that outer wall and the service
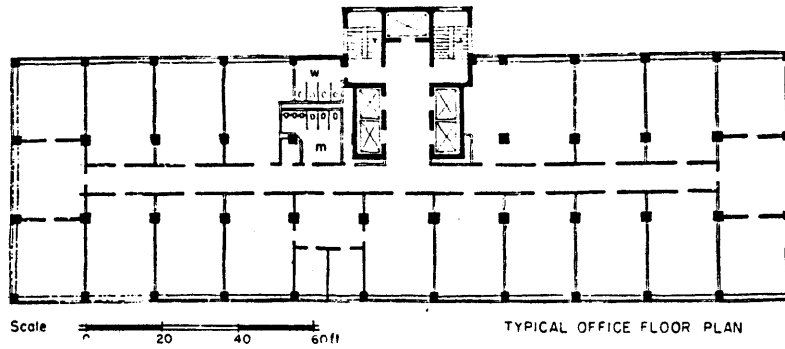
Scale [20 40 60ft]   TYPICAL OFFICE FLOOR PLAN

fig.12 Equitable Building,Portland (1948)
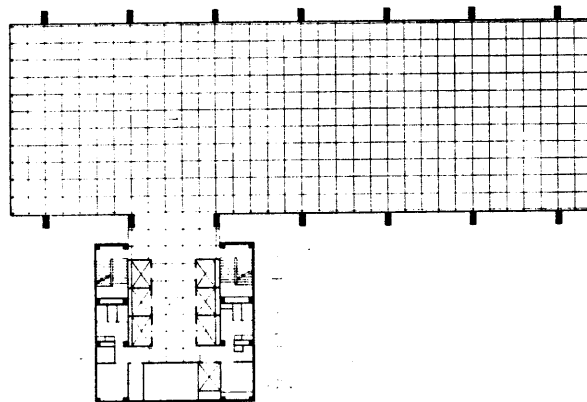

fig.13 Inland Steel Building,Chicago (1958)
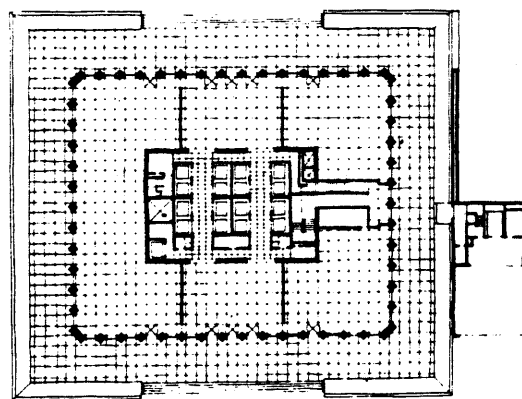

fig.14 CBS Building,New York (1966)

and elevator core in the building's center - producing a column free span of 56'. The tower formula, which utlizes a square plan in which floors span between the interior core and the external 'bearing' wall, is adopted by a number of buildings in the late 60's. Buildings like Chicago's Continental Center, Houston's Tennessee Gas Company Building, San Francisco's John Hancock Building, and New York's CBS Building, achieve clear spans of 50' - 60' by using this method. But concrete frame buildings like SOM's Hartford Building of 1961 in Chicago uses a bay of only 21' x 21', and the firm's recent design for the Irving Trust Building in New York returns to a grid of 30' x 30' columns.

The point about flexibility being dependent on the absence of columns seems to be argued with less and less fervor by writers of office planning books as time goes on. In the <u>Interior's:Book of Offices</u> which he edited in 1969, John Pile notes categorically; "Fewer and smaller columns are better than many large columns."[7] By the time of the 1976 edition, he admits that "Actually the presence of columns is usually quite easy to deal with successfully", going on to add that, of course, "...the absence of columns cannot present any problems at all".[8] Finally, in 1977, the author of a book on office landscaping admits that columns may have some role as space defining elements. "Interior columns help provide dimension and perspective and define the subjective areas with which individuals and groups identify."[9]

The quest for large span spaces, although it may have been initiated by planning ideas which insisted that columns interfered with flexibility, was probably fueled as well by a fascination with engineering feats. Interior designers of the early 60's were much taken by conference tables that spanned as much as 50 feet. Lois Green writes of the 'breath-taking expanse' of these tables that; "In the engineering feats involved the execution of the board table sometimes seems an indoor approximation of bridge-building."[10] Certainly the large span of the typical board room table was more a case of structural bravado than anything else. Far from having any relationship to flexibility, such tables often displayed a kind of honorific permanence. The 3-ton table designed for Inland Steel had to be hoisted up the exterior of the building before completion and suspended outside until the floor was laid in the area.
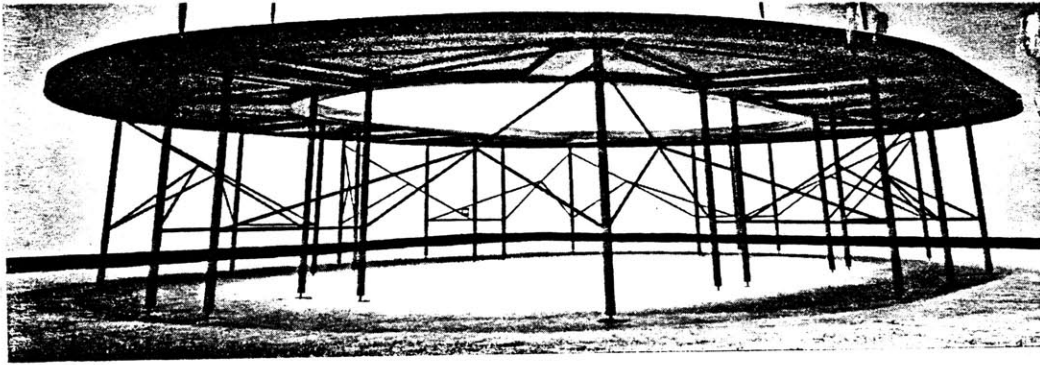
fig.15 Conference table,Ford Foundation Building,New York

Whatever the reasons behind the quest for large space spaces, the absence of columns combined with the centralized control of heating and ventilating,the uniformity of lighting, and management policies like those of Deere Inc.,to create spaces which lacked any sense of territoriality. The effect of prolonged exposure to the kinds of artificial environments which these places provided cannot be quantitatively determined - but one can speculate that their effect might be to produce a kind of artificiality in human response as well. One poignant story tells of the office whose white-noise generator was turned off one day. The staff, thinking that the air conditioning had broken down, became hotter and hotter and finally fled the premises.

Meanwhile the ratio of white to blue-collar workers was changing. Figures covering the 14 year period ending in 1960 indicated that the number of desk workers in the non-agricultural working force was increasing at twice the rate of the total. As offices began to represent a larger portion of the total costs of business, concern began to be voiced about the productivity of the office as compared to that of the factory. Just as the automation of the factory had brought about increases in productivity, the solution to the office problem was seen to lie in making it less labor-intensive. As the complexion of the office changed,

with routine office functions becoming more automated, the office itself
began to be perceived more and more as the home of middle management
and elite executive groups. It had become clear, as well, that the
quantity of information which was being routinely preserved in the
typical office was growing to gigantic proportions. A study of the
General Accounting office found that Federal paperwork consumed nearly
30 million cubic feet of space and cost an estimated $15,000,000,000
a year to handle. More than one-third of the files stored were inactive
and stuffed into 15 record centers. The average manufacturing organization
maintained two file cabinets per employee, while the average financial
organization maintained four. In response to these issues (and with the
knowledge that someone who defines a problem can often market its
solution), two ideas about the reorganization of the office space began
to affect the layout of the office. One originated in Germany and focused
on the office as a place of communication, the other was proposed by
Robert Probst, working on the development of office systems for a large
furniture manufacturer.

Bürolandscaft ideas were formulated in 1959 by a group called
the Quickborner team. Originally the company had been involved in the
provision of office equipment and filing systems. Frustrated by what
they saw as a mismatch between the needs of the modern office and its
existing spatial layout, they developed a system which they claimed
was not simply an arbitrary design whim but was rather the physical
counterpart to a certain managerial style.

The Quickborner team pointed to the necessity for the accommodation
of change and the need for increased communication in the office.
Advocating the opening up of office space, all walls were dispensed
with, including those which had previously demarcated the territory of
the managers and executives. Groups of workers are placed at the
geographical center of their field of operations, a matrix based not
on the established hierarchy of the firm, but rather discovered
through a series of interviews which established each workers'
frequency of contacts with others. The optimal overall shape for
facilitating the maximum number of contacts is a large deep space where
communication links can extend in concentric circles. Within this space,
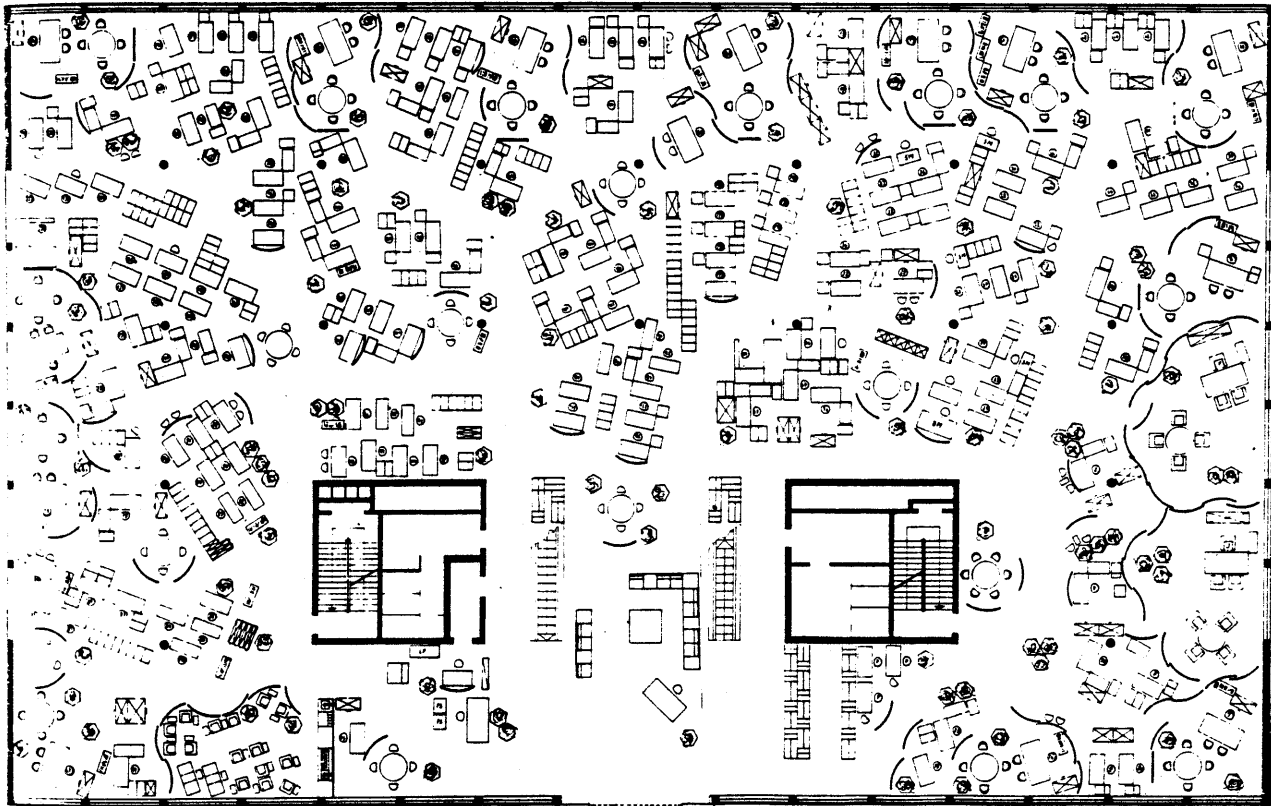separate departments are defined in a number of ways. The rectilinear

fig.16 Bürolandscaft plan , Quickborner Team (1963)

layout of desks is disposed of and replaced by what at first sight seems
a random and meandering arrangement.Workers within each individual
group are either parallel or at right angles to each other, while other
groups are aligned in different directions. Curved acoustical screens
and planting are used to further define territories as well as providing
some visual and acoustical privacy.As a solution to the problem of the
accumulation of 'dead' paper,the old style of office desk with its deep
compartments is abolished and replaced by a simple open table with
no storage capacity. Necessary files are moved to a centralized location.
The first installation of a Bürolandscaft office was in 1960 for the
Bertelsman Publishing Company in Güttersloh,West Germany.In 1967,the
concept was introduced to this country with DuPont's use of it for their
products division in Delaware,and soon other companies were experimenting
with the idea. In 1968 the Port Authority of New York tested the concept
on a group of its office workers and as a result decided to model its 15

floors in the World Trade Center along office landscaping lines.Eastman Kodak in Rochester and John Hancock in Boston were other companies which tried the concept in its early stages.In its American 'translation', certain of the ideas of the Quickborner team were either modified or dropped. 'Orthodox' Bürolandscaft's recommendations for the provision of casual meeting places and coffee bars in the workplace were often ignored, and in the case of the Port Authority, while the clerical workers moved into the open landscaped areas, management still retained private offices.

Advocates of Bürolandscaft made a number of claims. Besides claiming a reduction in space requirements, they argued that the system led to a decrease in maintenance costs, a reduction in set-up and renovation times, and an increase in staff productivity and morale. Certainly the first few claims were substantiated. In the Port Authority test, space requirements were reduced from an average of 160 sq.ft. per worker to an average of 140 sq. ft.(and later 100 sq.ft.), while still maintaining favorable attitudes toward the space. First costs were reduced by 60% and costs of a move by 97%. Similar results were found in the other studies conducted.

The claim that office landscaping improves employee productivity and morale is impossible to substantiate. Although studies at the Kodak installation and in the initial Port Authority test indicated that employees responded favorably to landscaping,other studies,like that conducted for Montgomery Ward in 1970, produced the opposite results. The inconclusiveness of such studies is only to be expected given the elusive nature of our relationship to our physical environment. On the one hand, workers' attitudes toward their physical workplace are colored by their perceptions in general about the company for which they work; on the other hand, the nature of questions asked in such surveys and the way in which they are interpreted is inevitably influenced by the person or group conducting the study. BOSTI's study of office workers was conducted at the same time as was the Steelcase survey of office environments. The latter indicated that more than 75% of office workers in 1979 were satisfied with their work spaces. The former, which had begun to be processed in 1980, was finding that more than half of the workers surveyed were unhappy with their workspaces.
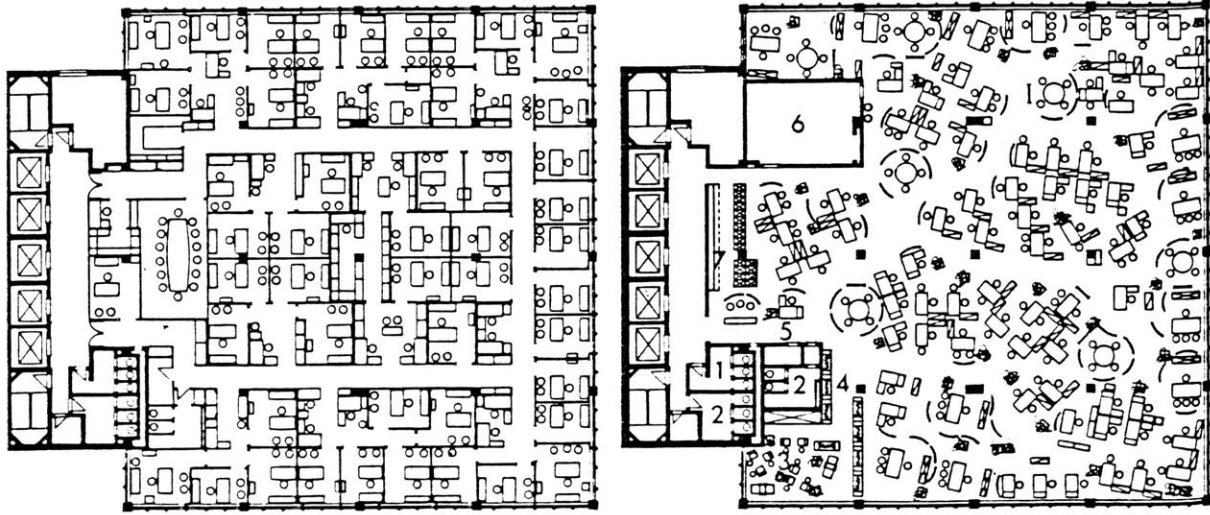
fig.17   Comparison of conventional and 'office landscaped' floors
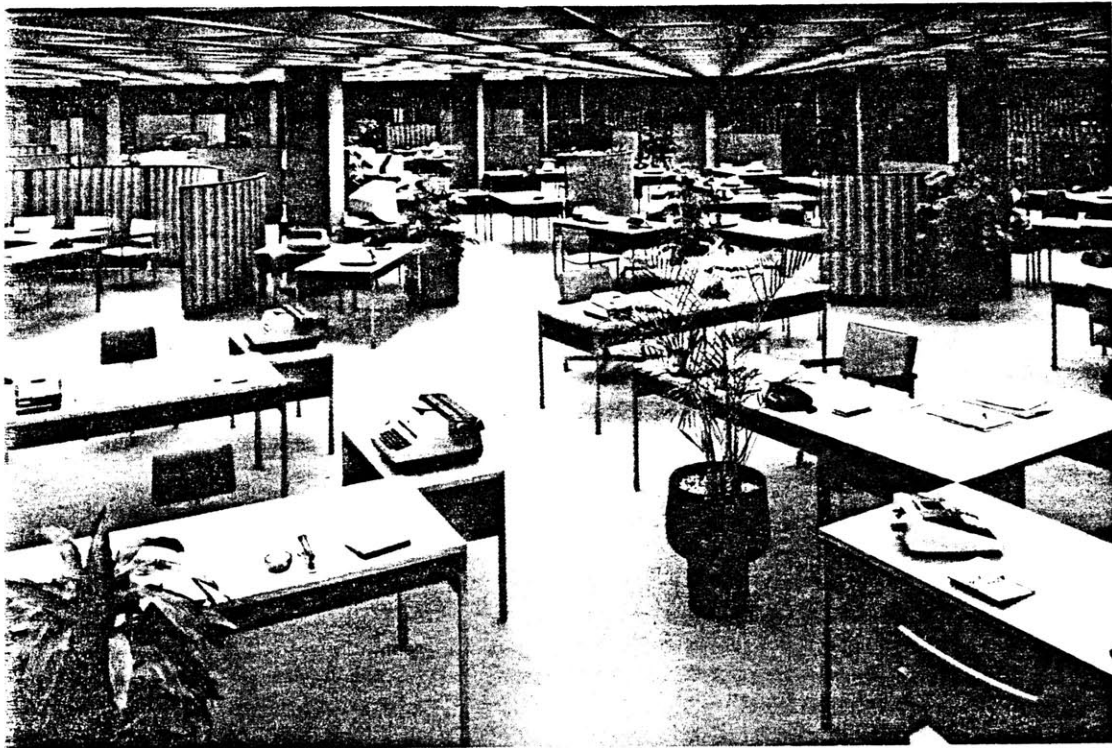Dupont Headquarters (1969)

fig.18   Purdue offices,Quickborner Team (1970)

Despite the impossibility of correlating morale with the physical environment, it is possible nonetheless to point to certain problems with the type of system advocated by Bürolandscaft ideas.

The openness advocated by office landscaping concepts is predicated on the overwhelming importance of a free flow of information in an organization. To what extent is this view justified? One organizational consultant points to the variety of organizations that exist. According to his view, every organization can be analyzed in terms of two qualities, which he calls 'bureaucracy' and 'interaction'. The level of bureaucracy, rated on a scale from low to high, describes the extent to which the organization is authoritarian,hierarchical, and rigidly organized. The quality of interaction has to do with the extent to which the members of the organization work together.The combinations of these two polarities generate four possible organizational types which will then determine whether an open office or a more cellular office would best serve the organization's needs. Bürolandscaft, then, advocates the adoption as a general principle of a type of spatial layout that might only be appropriate for some, not all, organizations.

The claim is made by advocates of Bürolandscaft that their approach is somehow more 'natural',an automatic response to certain existing needs. One author writes; "If people were left to their own devices they would organize physical configurations that permit the most direct and effortless lines of communication."[11] But is this, in fact, true? With its open furniture and screens which do not, in effect, belong to any one individual, Bürolandscaft layouts pay a heavy price in terms of territorial definition for a level of communication that may not, in fact, be needed. One advocate complained that when people in office landscaped spaces have to change desks,they have a regrettable tendency to want to take 'their' plants with them,not realizing that the plants are there to define circulation. "Seldom does logic, wheedling, or threatening convince them that the plants in their arms are part of the corridors and not theirs." [12] Certainly this is an indication that the office landscape system,while being,perhaps,organizationally efficient,is not adequate in terms of users' territorial needs.

Bürolandscaft claims to be democratic because everyone is placed out in the open, clerical worker and manager alike. In fact the openness
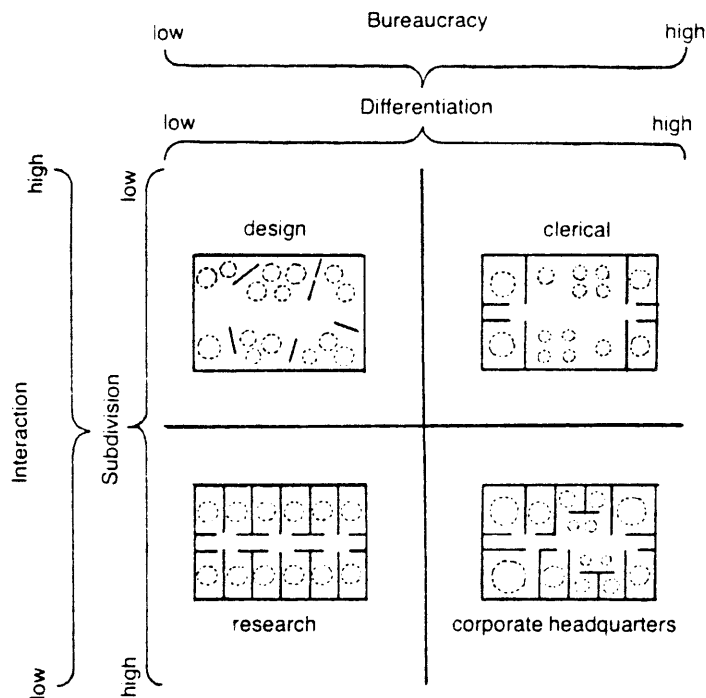
fig.19 Duffy's chart showing range of requirements for a variety of companies

serves as well as a means of providing supervision. The following
comment from an article advocating office landscaping is reminiscent of
the early Taylorists' advocacy of secretarial desks which could be
easily supervized.

> One indicator of bottlenecks in an office are
> desks laden with piles of paper.Office land-
> scaping allows the manager to view all work
> spaces so that any messy accretions can be
> quickly investigated and solved with a new
> filing cabinet or a new worker quickly installed.[13]

This idea of constant supervision is the basis for the common
complaint that landscaped offices are too 'public'.

Certainly, compared to some of the earlier'bullpen' arrangements
in offices, Bürolandscaft offers some improvements. The acoustical
screens provide some definition to the space, the looser arrangement
of desks, because more varied, is less oppressive than the earlier
rigidly rectilinear layouts, the carpeting improves the acoustical

fig.20 Open furniture advocated by Bürolandscaft concepts

properties of the office, and the plants soften the feeling of the
workplace. But in terms of user control and the possibility of personal
definition of one's workspace open landscaping as proposed by the
Quickborner team does not advance beyond the ideas proposed by Leffing-
well, Galloway,et.al. in the first decades of the century. In some ways,
in fact, office landscaping extends some of the less attractive ideas
of the Taylorists' approach. As the latter replaced the older roll-top
desk with one which provided less controllable privacy,Bürolandscaft
reduces the amount of enclosure provided even further by proposing an
open table for the work area.

Despite these problems, Bürolandscaft has been an important influence
in much contemporary office design. But the open plan offices which
have been designed along Bürolandscaft lines have also been influenced
by another set of ideas that developed concurrently with the concept
of office landscaping.

In 1958 Herman Miller hired Robert Probst, an inventor and sculptor,
to "...find problems outside of the furniture industry and to conceive
solutions for them."[14] Probst's attention, despite this directive, became
focused on the problems presented by the type of furniture used in office
spaces. As a result of his researches, Herman Miller's Action Office

system was introduced in 1964. In 1968 Probst's book The Office: A
Facility Based on Change,described the nature of his investigations and
the way in which the system he developed responded to his findings.

That system is a kit of individual parts which responds not only
to an analysis of the types of tasks with which the office worker is
confronted, but also recognizes certain conflicts between the need for
privacy and the need for communication, and sees, as well, that change
can be more easily accommodated by giving more responsibility to the
user. Rather than seeing the type of tasks which characterize the office
as being rote jobs, the system developed responds to the idea that
individual workers have certain responsibilities which they should,
in effect, 'manage' by themselves. The idea of this kind of decentrali-
zation of the management function had been advocated by a social psycholo-
gist named Douglas McGregor,a teacher at MIT's School of Industrial
Management. In 1960 McGregor introduced an analysis of management
concepts that contrasted two views which he labeled Theory X and
Theory Y. In contrast to the older Theory X in which management is
viewed as a process of ordering and forbidding as a means to assure
performance, Theory Y proposes that it is natural for people to seek
responsibility and that they enjoy it. The individual thus participates
in goal setting. In line with this thinking, Probst aimed to create
a physical environment which would be "...a more expressive and
manipulable tool in the hands of the office user himself." [15]Rather
than attempting to set up a physical and visual analog to the kind of
control proposed by earlier theories,Probst displays a more generous
and relaxed attitude toward the process of work.

> We have refused to accept people and work as
> part of the natural appearance of the office.
> Instead we have labored under the delusion
> that the only time an office looks good is when
> all signs of work underway and the people doing
> the work have been cleared away. At the heart
> of the matter lies recognition of the premise
> that things natural,interesting,relevant,and
> descriptive to man at work have a native poten-
> tial to be beautiful. [16]

In contrast to earlier ideas about the physical layout of the
office which stressed visual order,Probst attempted to devise a layout
which would recognize the multiplicity of tasks for which individual

..workers might be responsible. Because the worker might be involved in a number of projects simultaneously, the workstation provides a range of places where different projects can be worked on. Since tasks may take hours,days,or even weeks to complete, the workstation also allows the 'generated work' to be maintained over an extended period of time.

The range of workplaces offered for a single work station ranges from a low table at which one sits to a higher one at which one can work while standing, or with the use of a high stool."The whole idea of being able to accomplish everything from one seated position is unhealthy "[17],and the pricrity on limited mobility which was implied by the earlier static arrangement of office desk and chair is replaced by the idea of the importance of allowing the worker a range of physical positions which can be adopted for different tasks. These worksurfaces hang from notched panels, mobile wall-like elements, which can be adjusted to the most comfortable height. The vertical dimension of the panels are used above the 30" desk height - unlike the office landscaping ideas which tend to spread use surfaces out horizontally,this use of upper space creates more enclosure and provides the work area with its own screening independently from the use of separate partitions. The work surface/panel combinations are arranged in an arena type space which allows for a feeling of territoriality while at the same time allowing for the possibility of communication with the larger work group. By providing more than one work surface and more than one exposure position in reference to the opening of the office there are a variety of options in terms of privacy or openness which the user himself can choose. Since the worker himself is in the best position to judge what components_ will be needed for the types of tasks he may be involved in,Probst recommends a slight overstocking of parts, so that users can requisition components as needed. The hardware is modular and can easily be rearranged without the use of tools. "It is a matter of providing a general performance base and then providing adjustable facilities allowing user self-adaptation." [18]

Another conflict which Probst recognized was that between wanting a fairly neat work space and at the same time wanting to keep work in
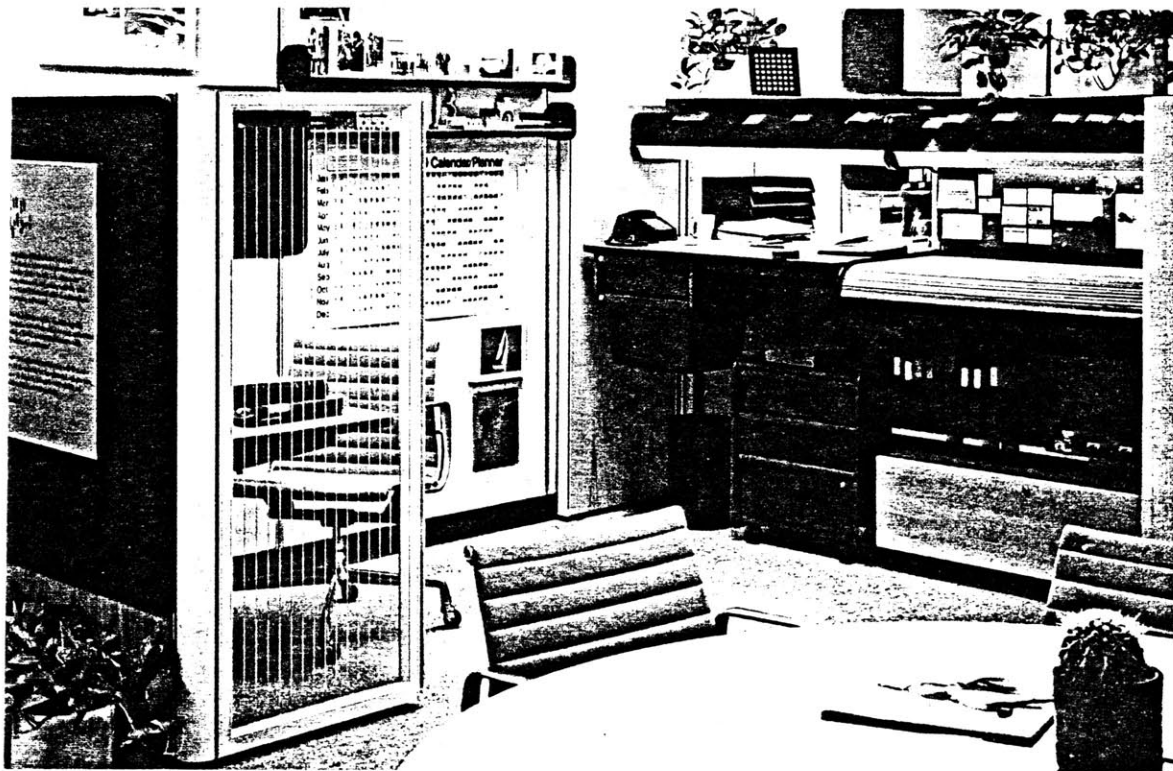
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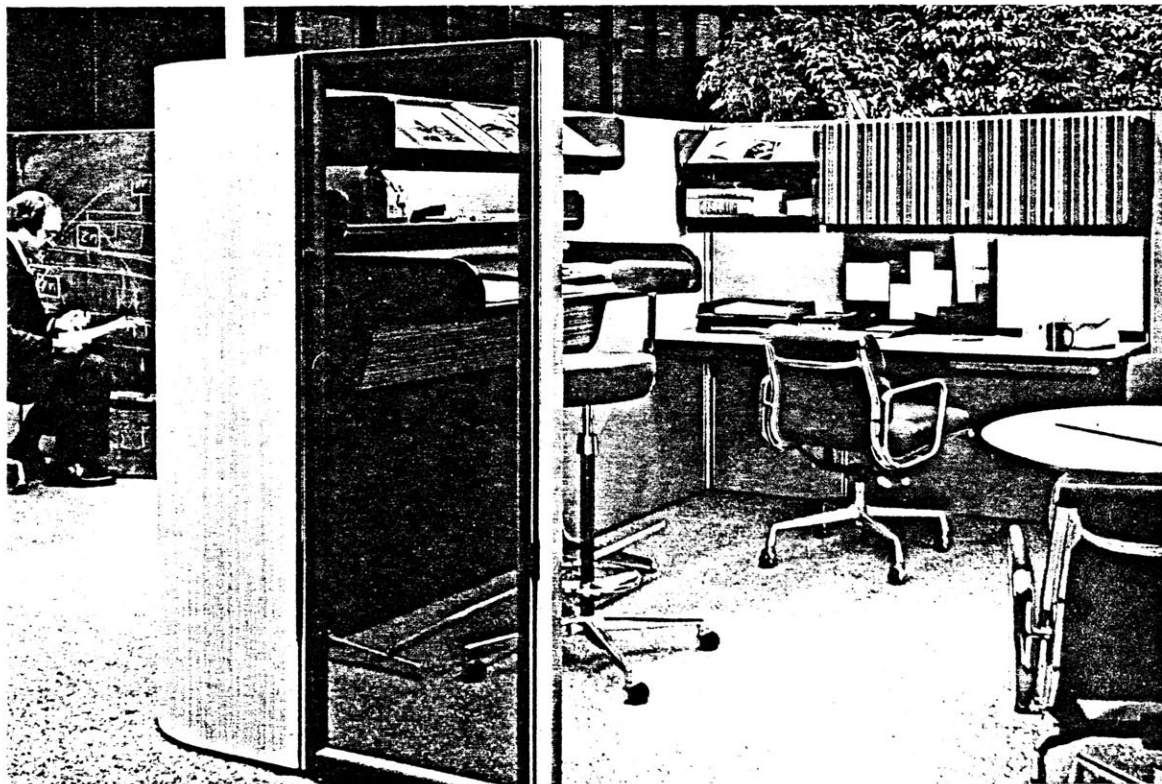fig.21 Action Office workstation
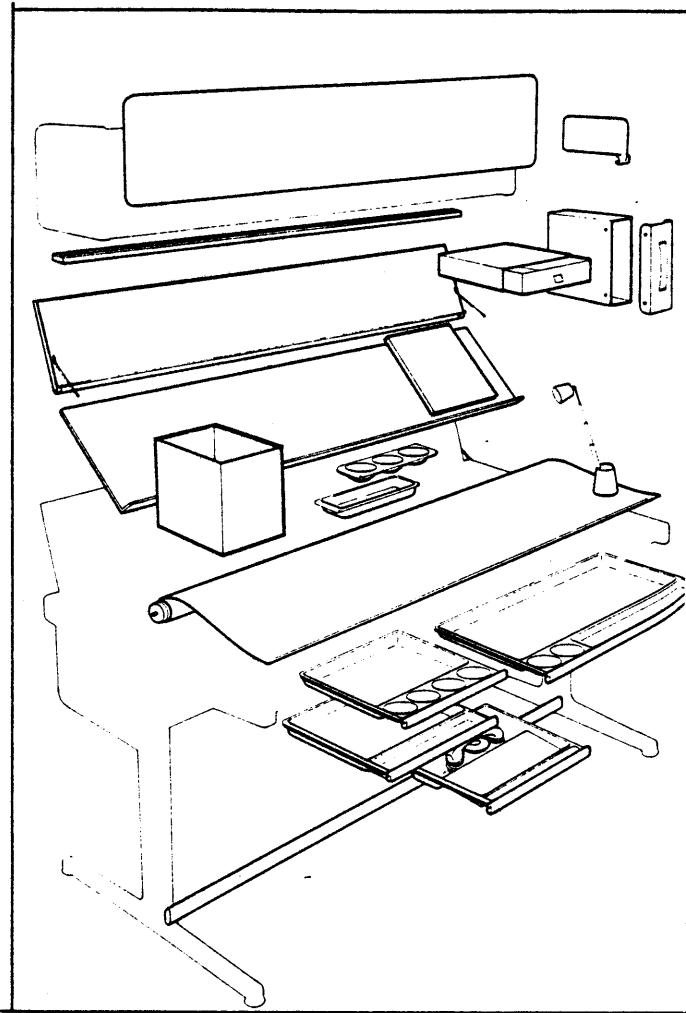

fig.22 Action Office workstation

fig.23   Typical Action Office desk with accessories and components
         shown in exploded view

progress undisturbed when called to other tasks. As a response to this
problem, he designed a new version of the roll top desk which can be
pulled over work-in-progress - leaving it undisturbed. Rather than
doing away with enclosure completely, as Bürolandscaft had done,as an
answer to the problem of the accumulation of 'dead' files, Probst made
drawers small, and used a visual display form of keeping documents so
that outdated material becomes quickly disposed of.

     The vertical surfaces of the panels can be used for personal
display, and,unlike the acoustical screens of office landscaping,
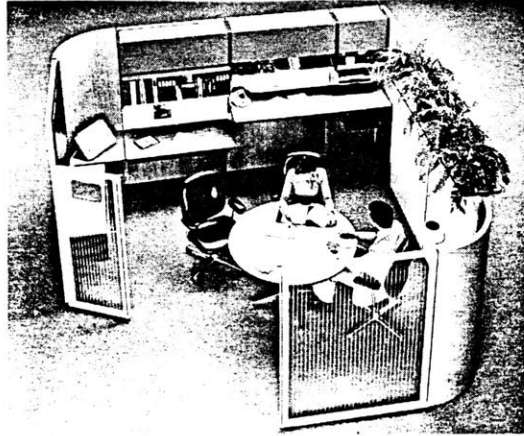'belong' to the individual work unit. The feeling of territoriality

fig.24   Action Office workstation

is further emphasized by the use of ambient lighting. Each worker
is thus the 'manager' of his own space. A small conference table on
wheels is provided which can be moved to different areas of the
workstation depending on the needs of the meeting. Probst also recommends
the provision of casual meeting places in the office as a means of
fostering the social links between groups that improve the flow of
ideas.

To the degree that it creates individual territories in a way
that the office landscaping ideas did not, Probst's system has much
to recommend it. It would have been odd, certainly, if the results of
a study sponsored by a furniture manufacturer had not indicated the
importance to productivity of an expensive furniture system,but rather
than calling for an honorific display along the lines of the 3 ton
table variety, the solutions proposed by Probst do seem to be serious
contributions to resolving some of the conflicting needs of the
workplace.

While Action Office furniture components can be more costly
than conventional office furniture, the higher initial cost is mitigated
by tax laws which allow accelerated depreciation and investment tax
credit on movable partitions. Thus the higher first cost of the components
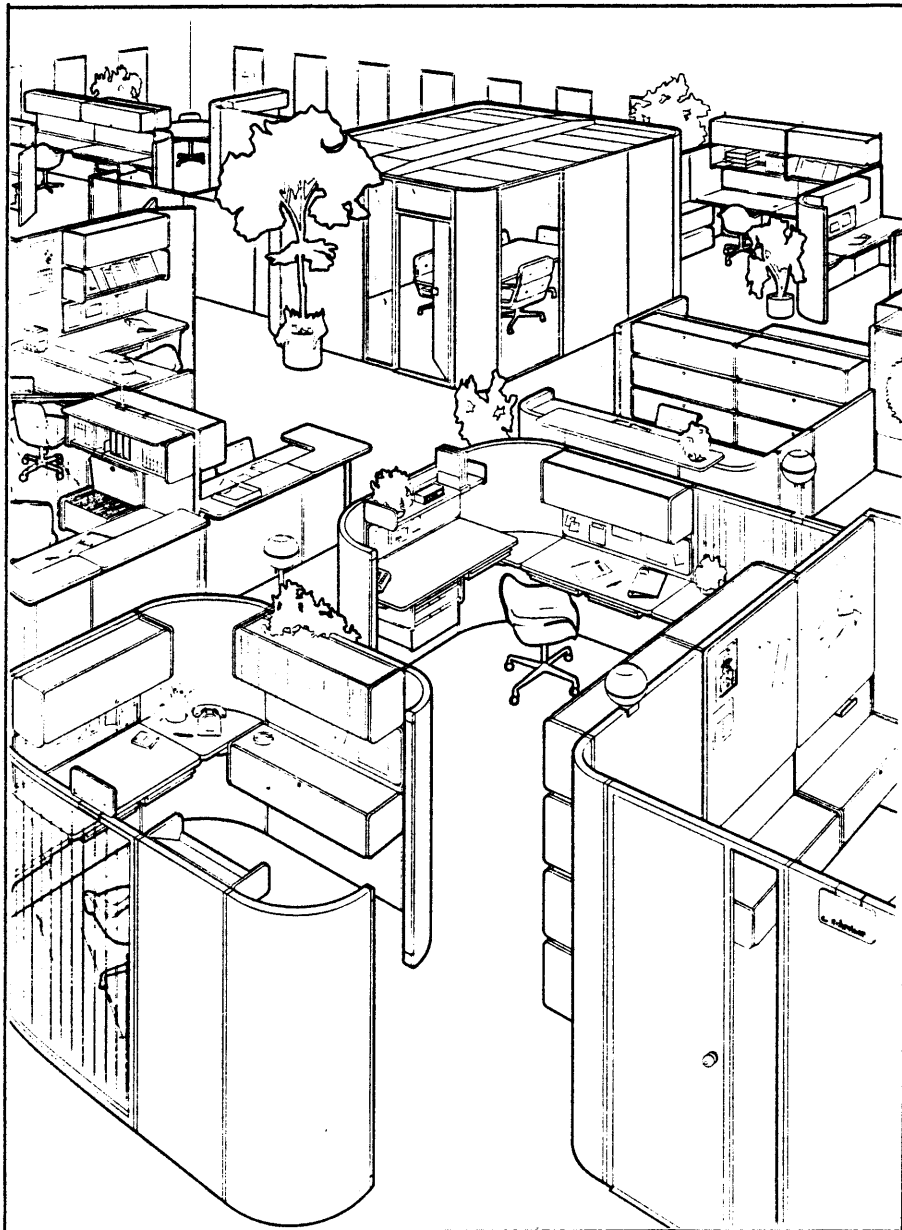can be recovered in 2-4 years.

fig.25 Office with Action Office workstations showing the range of
   enclosure conditions

Both Bürolandscaft and Action Office ideas have had a considerable impact on the planning of office space. An article in Architectural Record noted that over 47% of the offices designed in the preceding year (1978) had been open plan offices. Sales of modular units for such offices are increasing twice as fast as sales of ordinary office furniture - an article in Progressive Architecture listed 54 manufacturers for such systems.

To a degree,both Bürolandscaft and Action Office ideas were innovative in terms of the perception of office space. Action office concepts are concerned more with the design of workstations rather than with overall plan organization, and, as we have seen, are more successful at defining territory at the level of the individual user. With its greater concern for efficiency, Bürolandscaft has more similarities with the earlier 'scientific' school of office design. While the earlier model had been based on mechanical analogies, Bürolandscaft, with its stress on cybernetics, replaces this with an electronic model in which relays of communication determine the organization of office space.

Both systems are predicated on the 'shell and scenery' idea that presumes that the best way to accommodate change is to make the building shell as neutral as possible. Both are best accomodated in deep plan spaces where communication links spread outward in concentric circles. Two points could be made about the presumption of a neutral shell. The first relates to the amount of flexibility that is, in fact, needed. While certain firms change rapidly, others, like legal firms, experience change much less frequently. The BOSTI study shows, furthermore, that three/quarters of all office workers never move from one space to another unless the whole organization moves,while the remaining quarter moves as often as four times a year. A system which presumes a fairly uniform need for change for all workers will clearly be badly designed for both of these groups. The other point has to do with the degree to which the idea of flexibility precludes the presence of architectural definition. In the next section we will look at one building, Centraal Beheer, in which an attempt was made to make the building shell itself respond to the conflicting demands for openness and enclosure which the office presents.
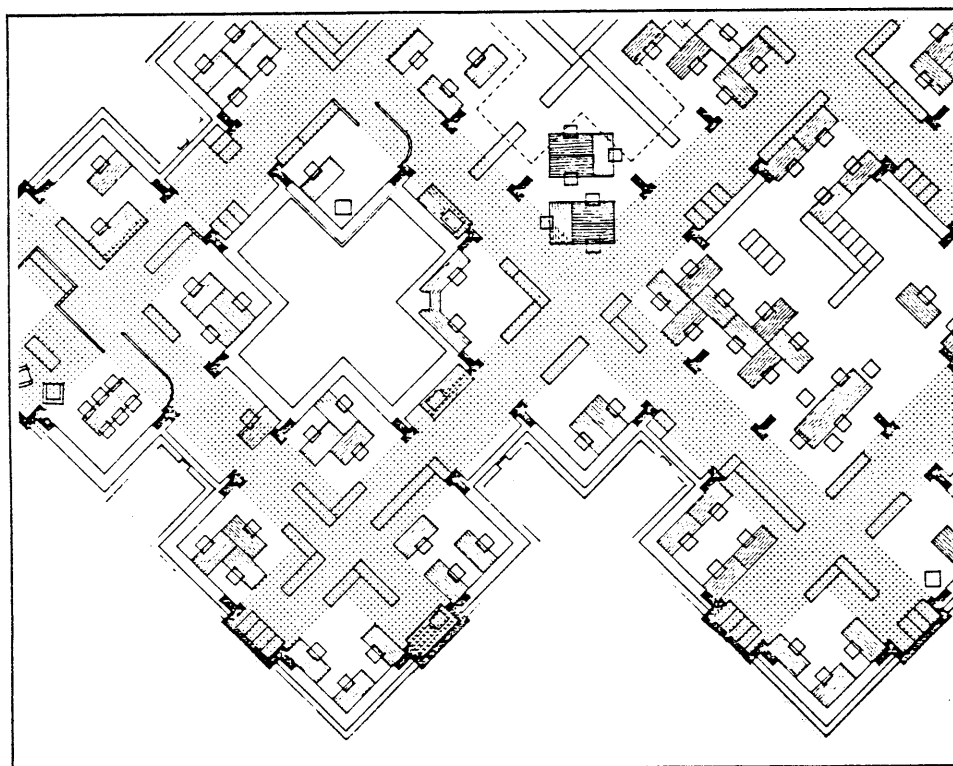
CENTRAAL BEHEER
HERMAN HERTZBERGER
1972

In 1968 Centraal Beheer, a large Dutch insurance company, decided to move its headquarters from Amsterdam to Apeldoorn, a town 50 miles to the east.

In writing the brief for the architect, the management stressed the fact that worker productivity was the most important cost factor in their firm. They wrote that, since optimal productivity could only be attained under optimal working conditions, the liveability of the new building was essential. It should be a place where "1,000 people can feel at home"[1] - where the workers could feel themselves to be part of a working community without becoming lost in the crowd. In order to achieve this end, they recommended the adoption of the Bürolandscaft model which had been introduced to Holland several years previously.

We have seen earlier how Wright, in the conviction that architecture should be more than "merely a box to contain objects it should itself create and maintain", had rejected the models available at the time in the design of the Larkin Building. Similarly, Hertzberger's convictions about the role of architecture led him to reject the model offered by the neutral shell into which work stations would be inserted. "It is not an outward form wrapped around the object that matters to us but form in the sense of inbuilt capacity and potential vehicle of significance."[2]

If, in Wright's case, the animating spirit was a vision of a timeless and harmonious unity, in Hertzberger's, the references to potentiality and capacity indicate a concern which grows from an acceptance of heterogeneity and change. Form acts as a catalyst in provoking the user into an imaginative engagement with the building. Rather than imposing one way to be, such form responds to a range of individual projections. The capacity to absorb, carry, and convey significance defines what forms can bring about in the user, and conversely, what the users can bring about in the form - "...what matters is how they mutually take possession of each other."[3]

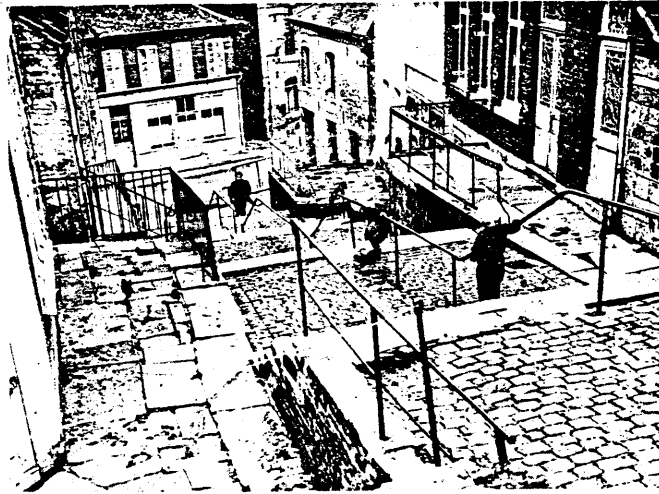In order to provoke this imaginative transformation, the spaces

fig.1   A street in an old town. The handrail accommodates a varity of uses.

provided by the architect,far from being neutral,should provide as many
associations as possible. What the architect must design is the 'raw
material' containing the intentions out of which everyone can make his
choice in a particular situation. Thus,"Every corner and every space
must be programmed for multiple roles."[4] Architecture in this sense
does not simply contain a program but has the power to launch one - when
forms, through their adhesive power to draw association from the users,
stimulate the individual to play the roles through which his identity
will be enlarged, form and program become reciprocally evocative.

In his writings, Hertzberger speaks of the presence of such adhesive
qualites in vernacular architecture. The street in a Mexican village
which becomes a river, the handrail along the street in a small town
which is a support for older people and a plaything for children, the
viaduct in Paris which accomodates a variety of infills - all remain
what they are while being available for a number of different readings.

A similar role is played by the brick podium in the hallway of the
Montessori school that Hertzberger designed in 1966. Fixed in its place,
it gains from its immobility by provoking reactions. Not a literal symbol,
it remains open to a variety of uses and meanings. Used as a platform
to sit on, or a place to put things down on, it is alternately a stage
or an island in a sea.An everyday object, it is neither too much itself
(the specific associations of a literary metaphor),or too little itself

(the 'freedom noise' of flexibility), and as such provides the kind of middle ground which Hertzberger has praised in Van Eyck's playgrounds.

By providing images which can provoke association with what is past while remaining capable of being filled with new significance,the goal of such form making is to create a "habitable space between men and objects"[5] and provide a continuity between what has come before and what is to come. The transformative process whereby older meanings fade and are replaced by new meanings dormant in the form allows for the possibility of historical continuity.

But if this range of associations requires a rich environment,it operates in a context defined by the presence of a strong architectural order. By providing a strong order the presence of the individual and the collective are both affirmed and it is possible to see them as complementary rather than opposed phenomena. "The framework is a constant and represents the order within which everybody's individual freedom and all freedoms together can be acted out and contained."[6] Unlike the 'anarchitecture' of Kroll, for example,where an attempt is made to assert the importance of the individual by denying the existence of any overall ordering principles; in the work of Hertzberger there is a reciprocal but autonomous relationship between the larger structural order and the specific demands of local spaces.

Thus the variety of the old town, for example, is seen not as being the result of a more comprehensive or richer data,but as the result of a sequence of spaces which,"...although generally not much different one from the other, allow individual interpretations because of their greater polyvalency."[7] In the case of the Parisian viaduct,the framework, a sling of clearly defined compartments,"...remains what it has always been, and what it can always continue to be;unalterable,yet always conditionally open for other meanings."[8]

The use of a 'strong' structure recalls the work of Kahn,a connection Colquhoun makes when he compares Centraal Beheer to Kahn's Trenton Bath House. Facing the problem posed by the opposition between the universal space of the Miesian aesthetic, with its weak rhythm of slenderly spaced columns,and the necessity for further defining the space for functional reasons with non-architectural elements,Kahn reintroduced the idea of space as built up from cells articulated by a
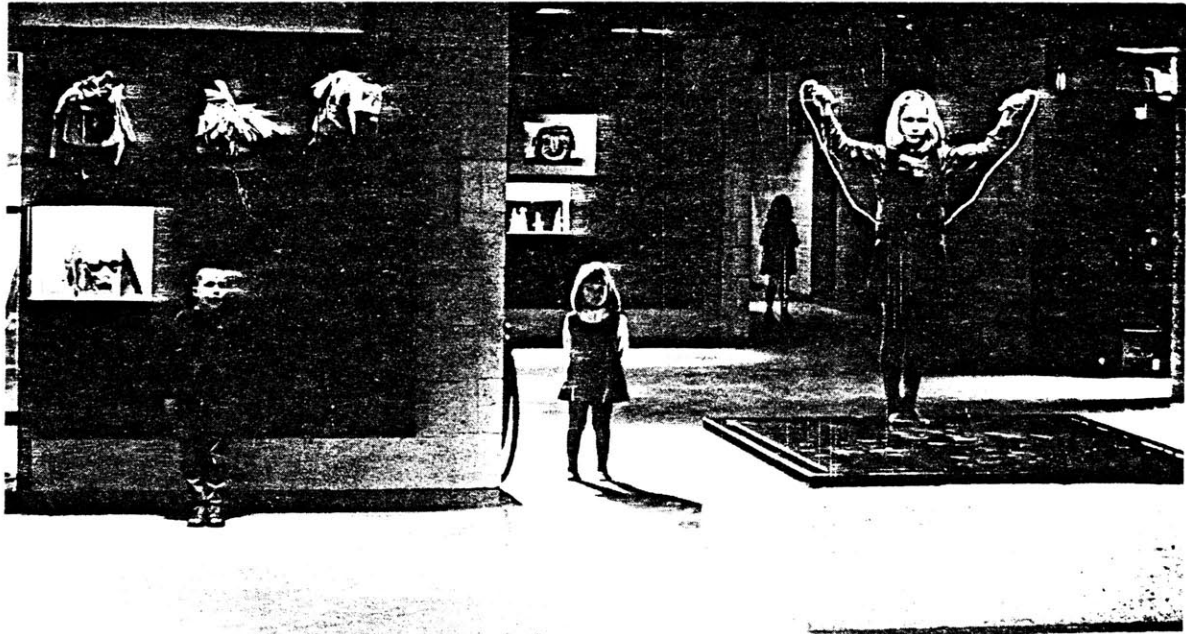
fig.2   The brick podium in Hertzberger's Montessori school

fig.3   The framework of the Parisian viaduct
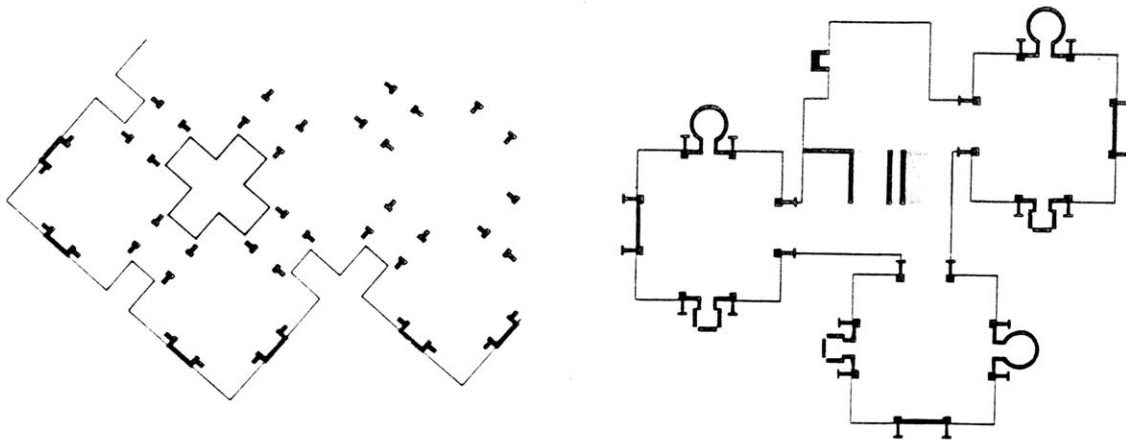
fig.4   Articulated cells   -   Hertzberger's Centraal Beheer
                                   Early version of Kahn's Richards Laboratory

strong structure. The pattern of served and servant spaces creates an architectural order, while the functional spaces occupy a varying number of structural bays.

Similarly, in Hertzberger's work the structural grid provides the 'backbone' for a variety of contents and allows for variation without losing its identity.

Although Hertzberger's concern with the modular grid has been seen as being a typically Dutch preoccupation, referring to the proportional systems of De Groot and Berlage, at its basis it has a social content. More than an elementarist composition, the order of the grid, by allowing individual variation, acts as a metaphor for the adaptation of the strong self to a variety of roles, and thus serves as a model for an interpretation of the role of the individual in the social group. Even about so 'abstract' an artist as Mondriaan Hertzberger writes that, in his attempts to bring the different weights of unique and intractable color units into harmony, he "...depicts models of real democratic communities."[9] In speaking of Rietveld and Duiker, he writes that beyond the 'lightness and radiant beauty of this architecture' what

is important, after all, is the prospect it offers of a different
world with better, thus less hierarchical relations. "It is as if
gravity were suspended in this architecture and the parts under their
own power were kept in balance by each other, in a spatial organization
that offers what each of those parts requires."[10]

If the scope of architectural form is to be opened up, it is for
the purpose of allowing established ideas and values to be phased out,
"...in order to make way for better relationships."[11]

This social dimension of architectural form; the correspondence
between the relation between part and whole in architectural terms
and the individual and the collective in the social realm, has always
been an important part of the ideology which was brought to public
attention through the pages of the Dutch journal Forum. In 1959 Van Eyck,
Bakema, and Hertzberger, among others, formed the new editorial board of
the journal, which was to become a vehicle paralleling Team 10's critique
of modernism. In an early issue, an article by Martin Buber, entitled
"The Problem of Man', is included. Buber wrote

> Individualism comprises only part of man, collectivism
> comprises man only as a part, neither constitutes the
> total image...The alternative : 'Individualism-
> Collectivism' is wrong and has to disappear. The
> fundamental fact of human existence is Man and his
> Fellow-Men. The atmosphere in which one human being
> communicates with another is the Land of the 'In-
> Between'.This is the foundation of human reality...
> Between the objective and the subjective, on the
> narrow border line where I and You meet, there is the
> Land of 'In-Between'. It is not permanent, but it is
> constituted anew every time.[12]

Ven Eyck, in his writings, has consistently stressed the importance
of this idea of in-betweeness as the territory where dual phenomena can
be reconciled. In writing of De Carlo's dormitory in Urbino, he says;
"What makes this building so...successful...(is that) it is at once
both...way of access and communication; both open and closed; both inside
and outside; both large and small, and has, above all, both individual
and collective meaning." [13]

In his orphanage in Amsterdam, designed in 1957, Ven Eyck attempted
to express these dualities. There, an additive system of clearly
defined structural cells is arranged 'labyrinthmically'. All spaces

are subject to the same structural principles irrespective of their specific function. "It is their place,sequence, and subsequent treatment; the relation to each other and the whole which gives them their qualities,their specific functional claims within the framework of the total plan pattern and constructional idiom." [14] In the concern for the inbetween as the common ground where conflicting polarities become dual phenomena,the 'street' linking the separate units becomes an important element. Rather than attempting to erase the distinctions between private and public areas, they are related by means of articulated transition spaces - in-between places which induce awareness of what is significant on either side. By stressing the importance of such connecting and relating elements, Van Eyck attempted to achieve the Berlagian ideal of unity in diversity.

The orphanage building, with its concepts of a building composed of aggregated units and its ideas of street and threshold, was an influential model for Dutch architects, and similar concerns are clearly seen in the buildings Hertzberger designed prior to receiving the commission to design Centraal Beheer. In the student house in Amsterdam which he designed in 1961, the entryway sequence has this transitional character.There is no sharp delimitation between the outside and the inside of the building but rather a sequence that leads one from the public to the private areas. In the Montessori school in Delft,the most active and complex parts of the building are the 'in-between' spaces where the class rooms and the hall open to each other;covered by roof domes they are the places where light is let in during the day and artificial light is let out during the night. The entryway to the building, a threshold, is as much an outward extension of the hall as an inward extension of the playground.

Given these concerns, it is clear that the models offered by the exclusively private cellular office and the enforced 'publicness' of the open plan would be rejected. Faced with the program of the office on the one hand and his concerns for the duality of the individual and the collective on the other, what alternative did Hertzberger propose, and to what degree does the solution respond to issues specific to the office?
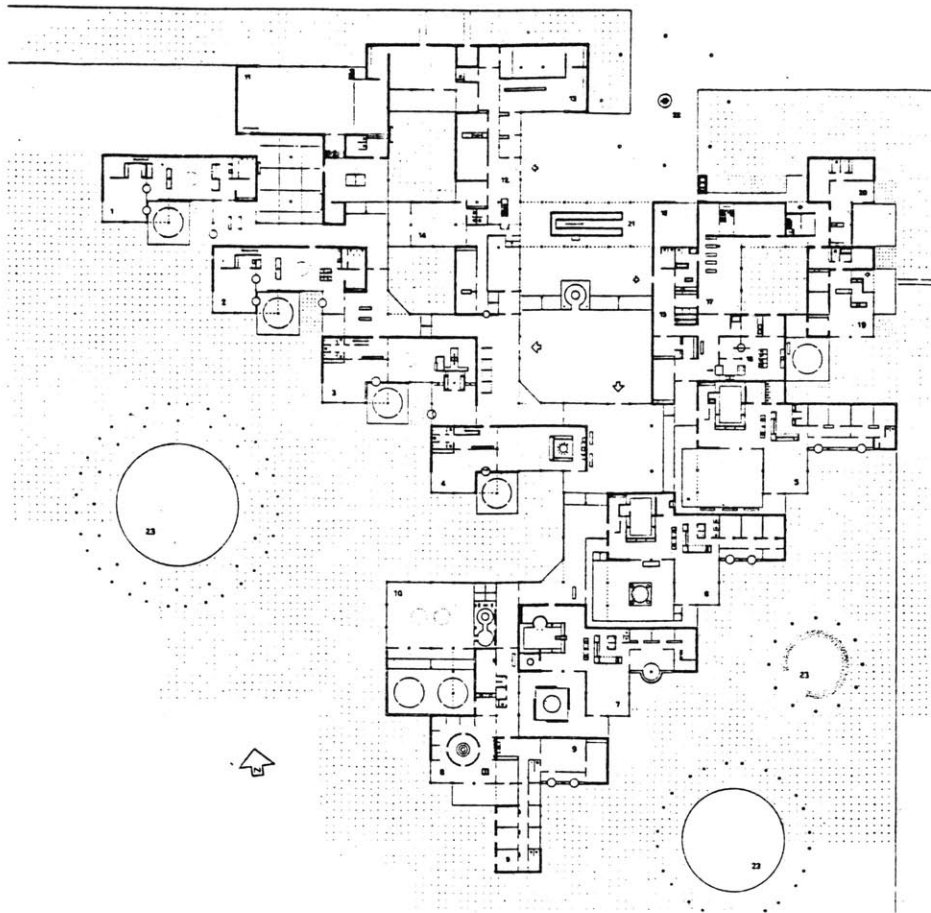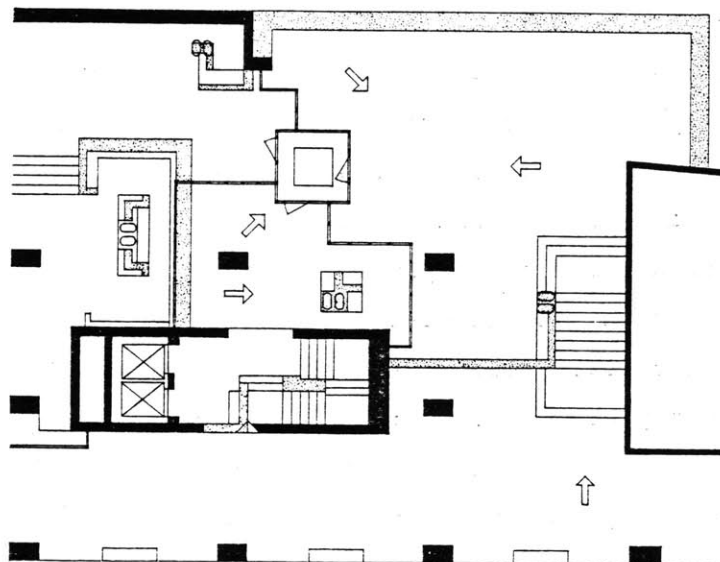
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fig.5   Orphanage Building,Amsterdam, Van Eyck

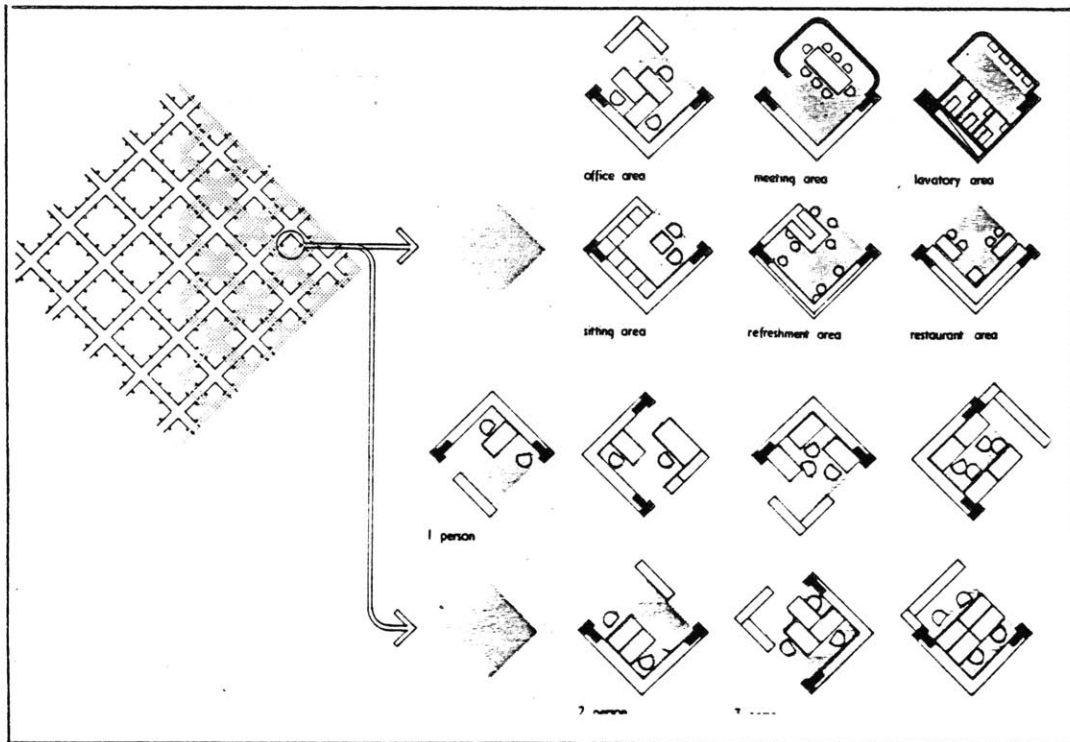fig.6   Entryway,Student house,Amsterdam, Hertzberger

fig.7   Diagram of basic module showing variety of uses

The smallest unit in the building is the module of the 9' x 9'
workspace which can accommodate from one to four people. Rather than
beginning with an overall dimension determined by space standards
which is then subdivided, the concept of the building emerges from the
definition of this small unit - "...workable units no larger than a
person or group needs and can care for on his or their own."[15] These
modules are deployed at the corners of an area defined by 8 massive columns.

While on the lower levels these cells join to accommodate larger
functional spaces, on the upper floors the office cells are separated by
6 foot wide voids which rise the full height of the building and are
capped by a continuous skylight. Since these intercellular spaces
occupy the full section of the building, one is able to visualize

level 4
level 3
level 2
level 1
level O

car parking
car parking
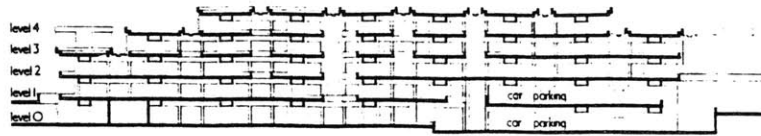
*Section AA showing vertical
penetration of space in both
central space and office
quadrants.*

services

lift/cc

Plan at level 3.

services

lift/cc

terrace
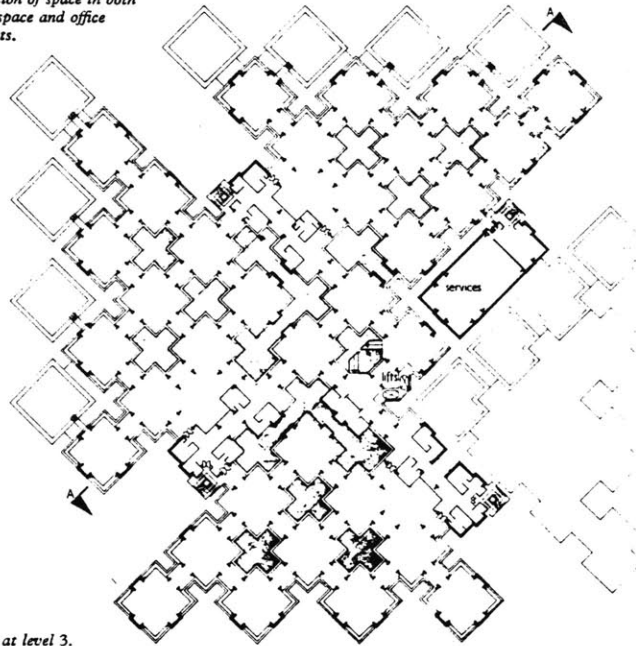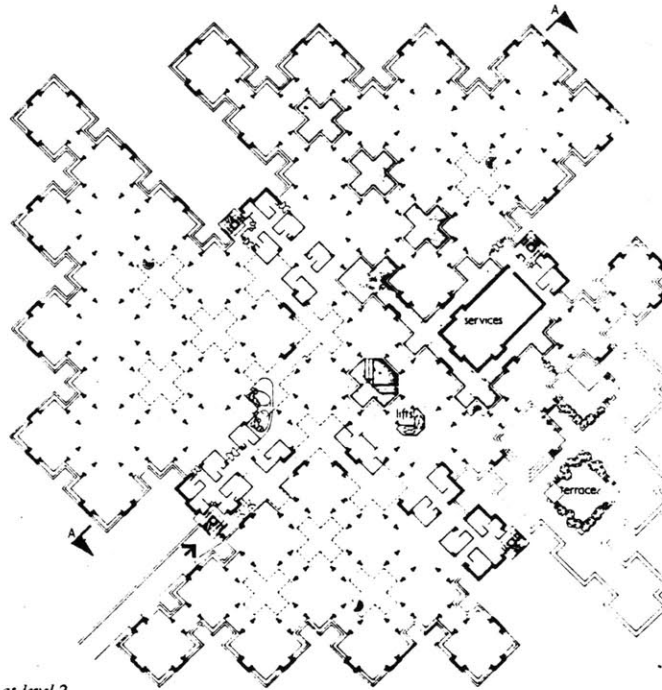
Plan at level 2.

fig.8   Section
         Plans @ second and third levels

the modules as elements floating within an overall structural unity.
Thus the identity of each work station is emphasized while the openness
of the entire building is reinforced. The cells are connected to each
other by bridges which prolong the implied circulation routes passing
along the two axes of the cells. In section this circulation area is
defined by a lower ceiling, which accommodates the service ducts,while
in plan the circulation area, implied without being rigidly defined,
can support a variety of conditions as it meets the workspaces. Where
the cells meet the voids, they are defined by upstand beams, or,in areas
adjacent to more public areas like the coffee bars, by walls of glass
block. The superimposition of cells is variable, sometimes cutting back
to create roof terraces.

This general organization, built up out of the aggregation of
distinct units of space, serves a number of purposes in the context
of the office.

The size of working groups in offices varies with the nature of the
work done. In programming for the workers in IBM's Santa Teresa offices,
for example, it was found that the workers spent 20% of their time
working alone and 50% working in groups of 2 to 3 people.While different
types of workers will interact with different sizes of groups, one office
consultant has noted that, in general, work groups in offices tend to be
small,so that the large uninterrupted areas provided by deep plan spaces
are not really that necessary. Studies conducted by the Department of
Building Science at the University of Liverpool in 1965 showed that
workers,in comparing five possible layouts for offices,consistently
chose those layouts in which workgroups were smallest. The concept of
such subgroups has been recognized by a number of office planners.
Pile writes that the optimum size of a work 'cluster' is from 5 to 9
people. Below that number people tend to use space in a way similar
to the conventional private office, while larger groups tend to suggest
the 'bullpen' arrangements.

In the case of Centraal Beheer, by making these work areas separate
entities and psychologically distinct, the potential increases for
the presence of a variety of conditions. The intercellular space also
sets a limit on the density of the building. In the continuous floor
plan of most office space, overcrowding often becomes an incrementally

fig.9   Interior,isometric

lighting strips   induction unit

fresh air injection
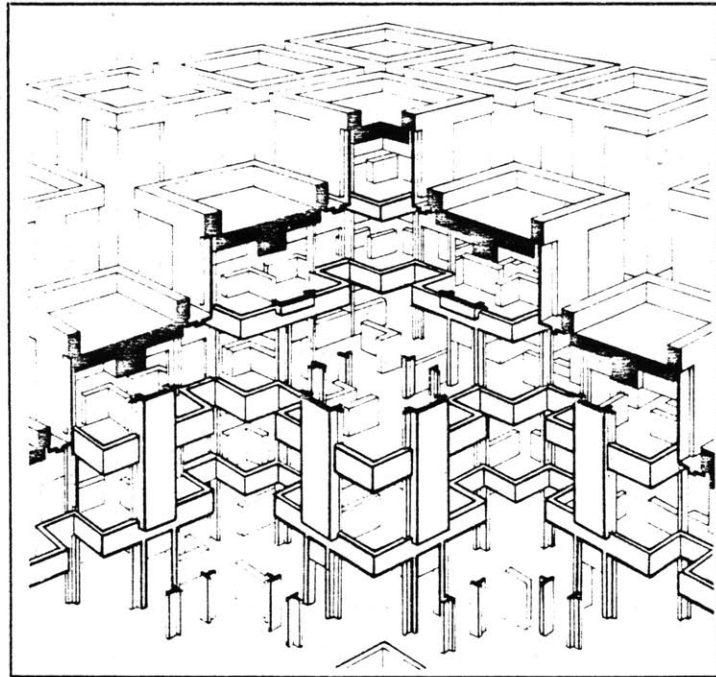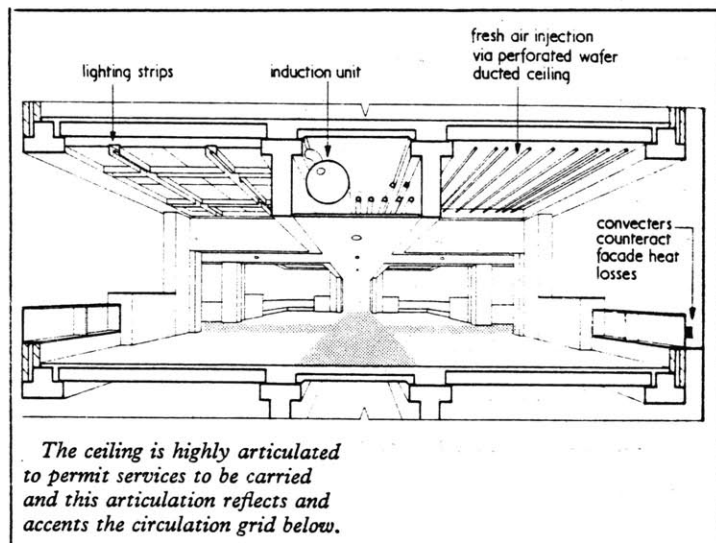via perforated wafer
ducted ceiling

convecters
counteract
facade heat
losses

*The ceiling is highly articulated
to permit services to be carried
and this articulation reflects and
accents the circulation grid below.*

fig.10   Section showing lower ceiling over circulation

accepted situation - here there is a 'built-in' resistance to such increased density.

The structural supports of each cell come at the midpoint of the floor areas. Thus,although the unit is enclosed at points and offers privacy, it is also open. Hertzberger often speaks of the importance of enclosure, and praises the sense of place provided by a plan like that of Bramante's for St.Peters. At the same time, in writing on the Rietveld house, he remarks on the openness of the corner - "When the large window opens across the corner, the world opens; a spatial experience of a completely novel dimension." [17] Thus there is a simultaneous desire for shelter and outlook. The combination of enclosure provided by the presence of the large columns and the outlook provided by the openness of the corners, solves the difficulty of combining the territoriality of the cellular office with the sense of the whole provided by the open plan office.In a suvey conducted by BOSTI in this country which interviewed 10,000 office workers, most of the respondents answered that they would like more privacy, at the same time, when asked directly, "If you could decide, how many people would work in the same room as you?" , two/thirds chose not to work alone.In a sense the formal strategies adopted by Hertzberger respond to this 'both-and' quality of people's desires for a place which is simultaneously their own and yet can accommodate others.

The visibility of the open plan office, promoted as as means of improving communication,often had as its effect the further isolation of the individual. Richard Sennett,in writing on buildings like Lever House in New York, notes that not only does the transparent window wall, by being hermetically sealed, isolate the activities within the building from the street, but the destruction of visual barriers inside the office, by increasing the feeling of surveillance, decreases sociability. "People are more sociable, the more they have some tangible barriers between them,just as they need specific places in public whose sole purpose is to bring them together." [18] Similarly, in the Halls' survey of Deere Inc.,the most consistent complaint was that of feeling constantly on display. Centraal Beheer provides closure in a variety of ways. At the largest scale the unalterable structural grid provides definition, but there is also a secondary structure of small
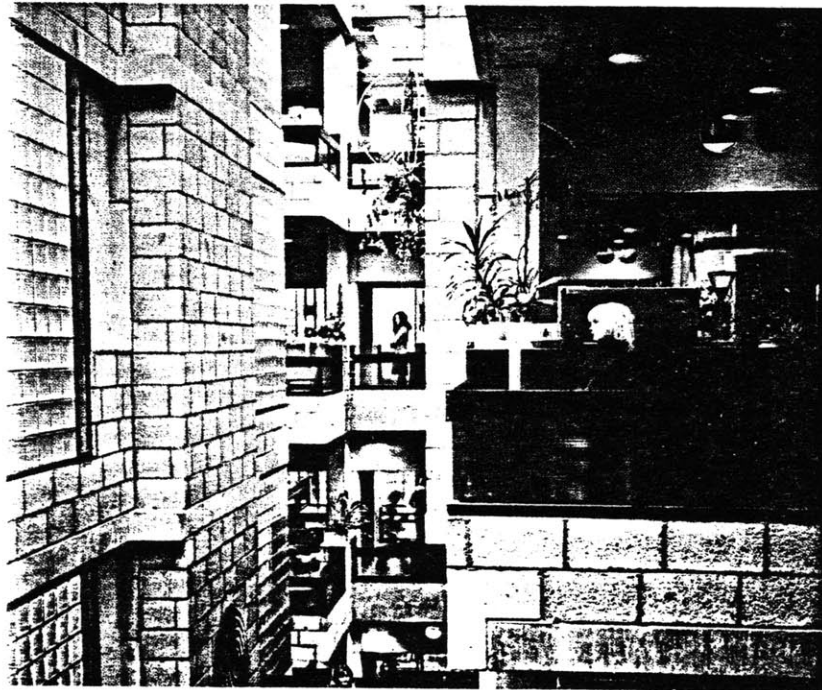
fig.11   Interior view showing relation of offices to intercellular voids
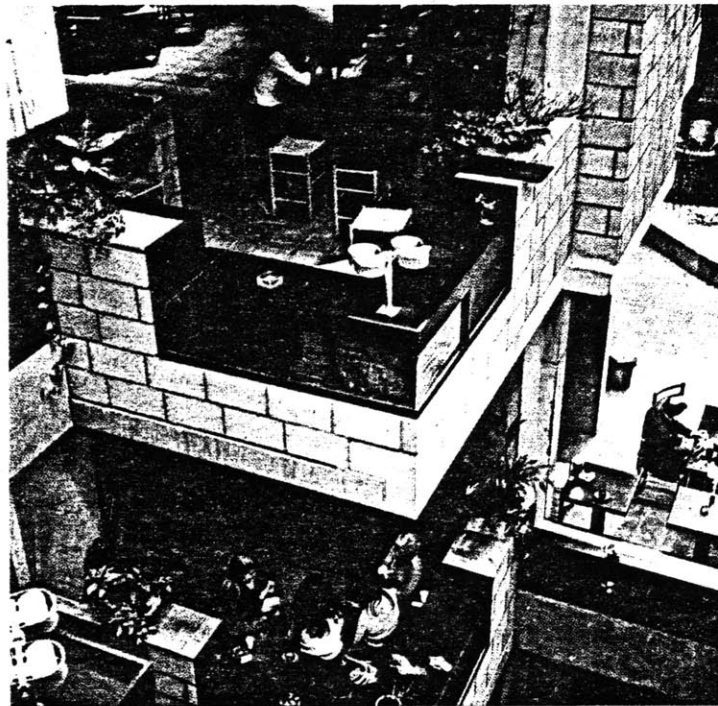
fig.12   Interior view showing the openness of the corner
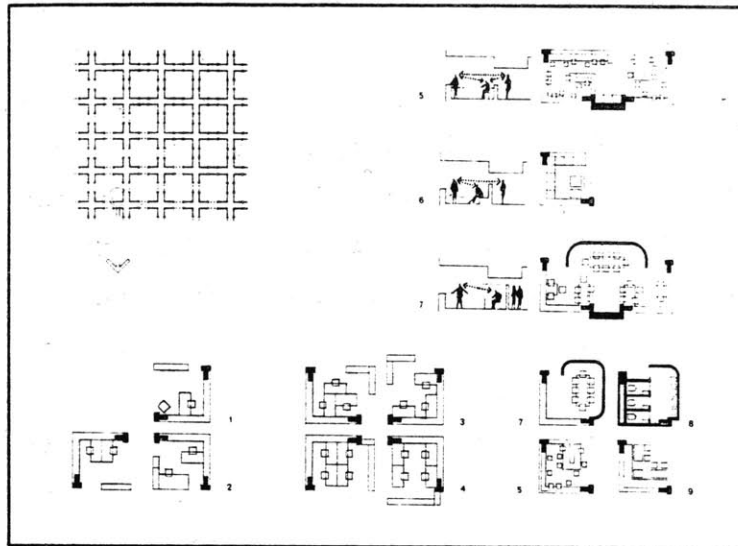
fig.I3 Diagram showing different enclosure conditions

concrete block partitions that are interpretable and variable. "Forms
are only designed to a coarse grain, leaving allocation of work stations
and furniture arrangement to the discretion of the users, so the space
can be constantly changed." [19] Since the work spaces are small defined
territories,the decision to rearrange can be made by small groups -
something less likely to happen in a large landscaped office where the
option for change is underutilized because no individual worker or
group of workers feels responsible for the whole space. Attention was
paid to the effect a variety of enclosure conditions would have on
social contacts. Thus the low partitions in the coffee bar area provide
the most opportunity for contact, while full height movable partitions
can be used to close off the more private conference areas.

    An early survey of workers in open plan offices discovered that,
even when a sense of enclosure was provided by partitions, the latter
were often barriers with surfaces difficult to use. The curved acoustical
screens adopted by early Bürolandschaft offices were not designed to
accommodate personal display.The slick metal surfaces of many office par-
tition systems, with their institutional associations, have a similar
problem.

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The concrete block used by Hertzberger in Centraal Beheer recommends itself to him not only because it allows the whole to grow from aggregated units,but also because he feels that its unfinished quality provokes the user to add his or her own contribution to the space. Aside from the brighter colors of the elevators and escalator, the color of the unoccupied building is provided by the greys of the poured-in-place and unit concrete. "It is the fundamental unfinishedness of the building, the greyness,the naked concrete...that are meant to stimulate the occupants to add their own color." [20]

Whether such neutrality by itself could provoke participation is, of course, doubtful. Saarinen, in designing the Deere headquarters, had used charcoal and off-white colors in the interior so that "... people would add the color",but the results are quite different. In the case of Centraal Beheer, the sense of territoriality provided by the spatial definition of the building combined with the willingness of the management to make the type of personalization that occurred possible.

The main circulation path containing the entrances, enquiry desk, coffee bars, escalators, and similar public functions, runs through the four quadrants of the building. The north and east quadrants were designed to house the offices of Centraal Beheer, the south was planned as rental space, and the west to house facilities like the restaurant, nursey, reading room, library, etc. In keeping with the larger regional plan for Apeldoorn, the lowest level of the building was to accommodate shops which could connect with the central-city area.The earliest critique of modernism by Team 10 related to the former's separation into different functional categories of the realms of house,workplace,and city. The range of activities which occur in Centraal Beheer attempts to provide some continuity between types of uses which are often artificially separated. Hertzberger writes

> The openness is intended to contribute to the
> reconciliation of building and city,public and
> private. Mother and children may have a walk in
> the building to see where father is working and
> what he is doing. They may have a drink together,
> or, as many families do, lunch in the restaurant. [21]

The individual work stations open on to the public circulation

area ,which,in its reliance on daylighting,use of material, and mix of activities, refers to the urban street. The background noise which filters through provides a natural 'white noise' which contributes to the privacy of the individual office spaces, while the contrast in lighting between the daylit voids, the darker corridor 'bridges', and the light produced by the mixture of incandescent and fluorescent fixtures in the individual offices provides a variety and sense of definition denied by the luminous ceilings of offices in the 50's and 60's. The presence of informal places designed specifically as gathering areas, like the coffee bars, adds another level of differentiation.

Centraal Beheer, with its articulated transition spaces, range of places to be, and provision of opportunities for a variety of social contacts, has a 'civility' which most large office buildings seldom have. In terms of the duality achieved between the individual space of the worker and the collective space of the workplace as a whole, it is interesting to compare the building with an American example that is often praised for its inclusion of a large 'public' space - Roche & Dinkeloo's addition to the headquarters of Deere Inc. in Moline, Ill.

In this building, the offices are arranged around a 11,000 sq. ft. garden, which, with its picturesque arrangement of trees and its paths formed by the staggered arrangement of granite slabs, is as 'natural' a landscape as could be managed under 80% reflective glass. The interior offices are arranged in a rectilinear fashion, since it was thought that this layout could accommodate more workers in a given space. The zone where these two realms of the garden and offices meet is almost razor thin - the last granite slab of the garden just treads over the carpet of the offices. In this contrast one writer commented on a parallel to classic Italian urban living - where the individual who lives in a cramped apartment can escape into a grand piazza in order to socialize. The garden at Deere, however, is anything but a piazza. It is a place into which one looks and through which one moves,but there are, in it, no places to be. Like the public space at the street floor of Lever House, which adopts the form of the plaza without providing any of the possibilities for mixtures of people and activities which characterized the historic plaza, the space is essentially private. The world of nature evokes associations with the private, rather than the social, realm, and

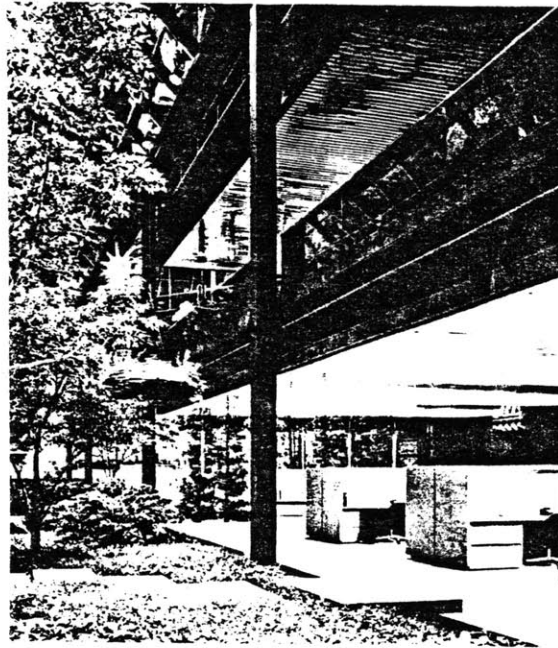fig.14 Deere Inc. Addition,Moline,Ill. Interior court

fig.15 Deere Inc. Addition. The zone where the office spaces
meet the garden

while natural and private places are welcome at the right scale (one thinks of the restfulness of the cloister garden),the attempt to make such places accommodate the functions of a public space only confuses the two realms and contributes to the breakdown of the public domain in contemporary life to which writers like Arendt and Sennett have pointed.

In The Fall of Public Man,Sennett draws attention to the degree to which the universe of social relations created from the distinction of the public and private realms has, in contemporary life, grown more limited as the world of intimate feelings, having lost its boundaries, is no longer restrained by a public world in which people can make alternative and countervailing investment of themselves. There is thus no longer any sense of meaningful encounter outside the terms of the single self, and an imbalance arises between an empty public domain and an intimate domain overburdened with tasks it cannot fulfill.

For Hertzberger, the existence of these two realms is essential to self-realization. He writes about the street that it should

> ,...become the possession of its residents who,
> through their concern and the marks they make on
> it,turn it into their own communal territory -
> after the privacy of the house the second
> prerequisite for self-realization. [22]

The possessing of space is achieved through the individual's investment in the types of forms which it is the architect's role to supply. In the discussion of this expressive relationship between user and form, Hertzberger has invoked the image of the actor and the role. As people must put themselves into the place of a form in order to be able to appropriate it, so must form put itself into the place of people to be appropriated. "Thus we could look upon this duality of hospitality of a form as the spatial equivalent of entering into a part." [23]

> Just as the identity of the actor extends
> as he plays more roles, so our identity
> will grow as we are drawn to a greater
> diversity of roles, that is, relationships
> to others. Thus we have to make the things
> such that it becomes in reality possible
> for everyone to show as many facets of
> himself, to be himself in as many ways as

> possible.As the possibilities of interpre-
> tation are increased, so the more facets of
> himself the individual can express but at
> the same time the greater number of people
> who can simultaneously be drawn into related
> behavior. [24]

This idea of relatedness achieved through expressiveness is at

the basis, as well,of Sennett's vision of the possibility for the

return of the public realm. For him, in the estrangement from a

meaningful impersonal life provoked by the dependence on the intimate,

the self is robbed of the expression of certain creative powers which

all human beings possess potentially - the power of play - which

requires a milieu at a distance from the self for its realization.

The idea of theatrum mundi, in its equation of society with theater

and everyday action with acting, suggests the unity of aesthetics and

social reality.

> Playacting in the form of manners, conventions,
> and ritual gestures, is the very stuff out of
> which public relations are formed, and from which
> public relations derive their emotional meaning.
> The more social conditions erode the public forum,
> the more are people routinely inhibited from
> exercising the capacity to playact.The member of
> an intimate society becomes an artist deprived of
> an art. [25]

When a person cannot imagine playing with his environment,playing

with the facts of his position in society, playing with his appearance

to others, he loses the sense that worldly conditions are plastic. Thus

the absence of the public realm tends to maintain conditions as they

are, rather than provoking them to change.

To the degree that it reinforces the notion of the environment

as a place which can be manipulated and 'played' with by its users

("...established certainties must be traded in for an appeal to the

imagination" [26]),Centraal Beheer's urbanity goes beyond the provision

of a metaphoric street. By asking what spatial conditions encourage the

expressivity of the individual, Hertzberger has attempted to infuse the

workplace with a public dimension. Rather than perceiving the office as

a necessarily alienating environment from which one escapes to the

intimate privacy of the worlds of family and leisure, it becomes

possible to see how places of work, through the impersonality of the

public realm, can contribute to the well-being of the individual.

Hertzberger's building has been criticized for its lack of a public presence and its anti-urban massing. While agreeing that criticism on these grounds is valid, it might be suggested that the more important 'urbanity' of the building lies in the promise it offers for a return to a public realm in which we will no longer be actors without an art.
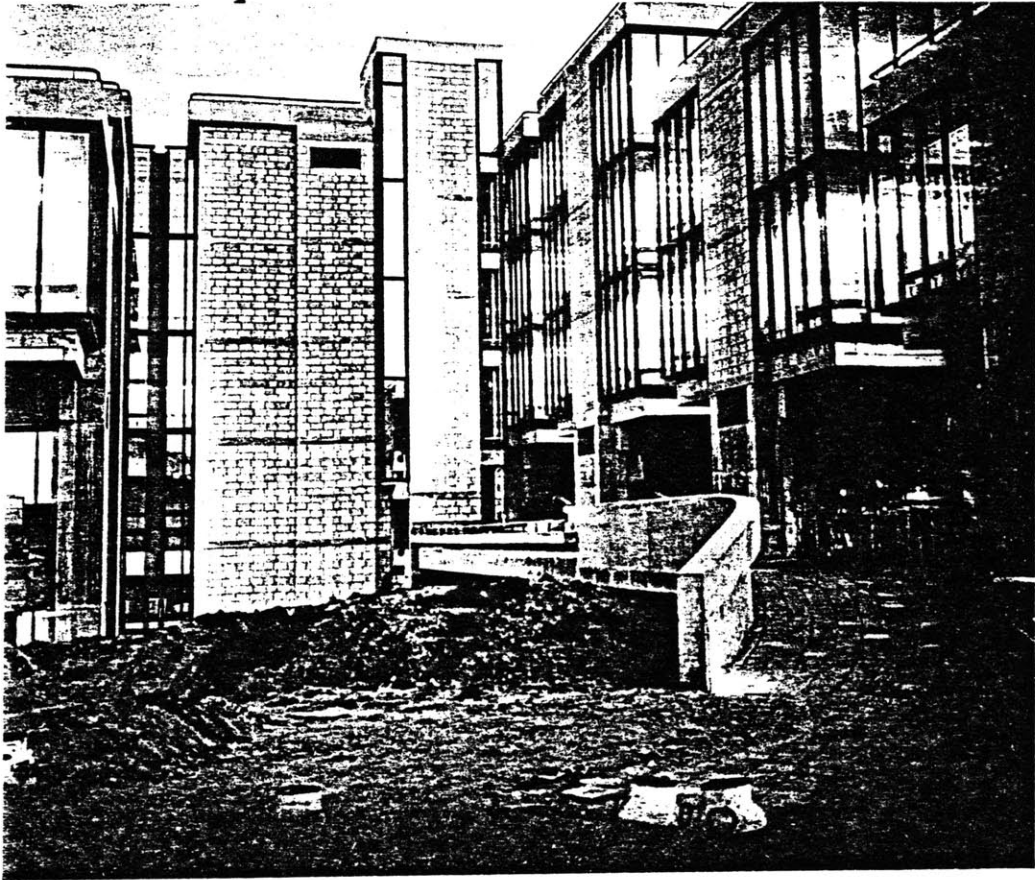
CONCLUSION

"(The world) is related...to the human
artifact, the fabrication of human hands,
as well as to the affairs which go on
among those who inhabit the man-made
world together. To live together in the
world means essentially that the world
of things is between those who have it
in common, as a table is located between
those who sit around it;the world,like
every in-between,relates and separates
man at the same time."

H.Arendt   The Human Condition

Having looked at the development of space in the office a number of conclusions can be drawn. To a certain degree the spatial layout of the office has developed in response to organizational changes in the nature of office work as well as to the development of new technologies. The cellular offices of the 19th century office building evolved as appropriate responses to the small scale business activity of the time - while the configuration of these same buildings responded to needs for light which could not be met artificially. As these conditions changed, offices experienced changes as well. But apart from these 'objective' determinants, the organization of the office has also reflected certain values about the nature of the workplace - values which have often had little connection with the real nature of office work. As we have seen in the case of the model set by the early promotors of 'scientific' organization, the rectilinear arrangement of desks,the lack of enclosure,the emphasis on the removal of distracting elements, were more the expression of certain values than the result of any scientific analysis.

A similar case can be made for the changes in office layout which were brought about by concepts like Bürolandscaft and Action Office. Both concepts arose concurrently in response to the perception of the failure of the older models to accommodate the amounts of communication with which the modern office was forced to deal. But each one did so in a different manner, which gave varied weight to issues of territoriality and individual control.Thus innovation was not an automatic response to certain technological or organizational changes but involved the selection of solutions based on subjective criteria.

As the office becomes more machine dependent, with increased use of computers for processing,storing, and communicating information, a number of possible 'futures' have been imagined. In one scenario, as the number of rote jobs decreases, the office becomes the province of elite groups who no longer need to be centralized in large office buildings. Given these conditions, satellite offices, including

offices in the home,or,as in the baroque era, offices in the coffee
houses of the city, might become commonplace. Other scenarios see the
need for even greater flexibility as change accelerates, with work--
stations designed for different functions and shared among a number of
workers. 'Mobile' clerical workers would make the rounds from desk to
desk, carrying their equipment with them.

But while futurists are speculating on the type of workplace we
might inhabit in 50 years, the increased use of computers does not
automatically improve conditions in terms of some of the needs for
individual control and variety which have been discussed. IBM's
approach to work processing stations, for example,splits the traditional
secretarial job into two categories, with one group transferred to a
central location and responsible only for word processing duties.This
increased specialization of functions results in a spatial distribution
that recalls the centralized stenographic pool of the earlier office,
with results from the workers' point of view that are equally unsatis-
factory.

The early office manuals of the 20's included information relating
to many different scales of design - from organizational structure to
the type of cleaning fluid that should be used on the lighting fixtures
in the office. As we have seen, as the office grew in size and building
activity increased, the people involved in the range of decisions about
office design tended to break into different groups - the space planner,
the architect, the interior designer, Increasingly analysis became
separated from design. In one book on office planning, the author devotes
a chapter to the type of planning process which would characterize
the design of a landscaped office. Beginning with levels of interaction
between individuals, the planner would set up a matrix which plots
workers in terms of their level of communication with each other.From
this a certain numerical figure is derived for each individual which is
called their 'index of interaction'. Individuals are then plotted in a
diagram that allows for the locational variables of 'adjacent', 'diagonal',
or 'removed'. Again assigning numerical values to these variables,they
are multiplied by the previous index of interactions to get a new number
called a 'figure of merit'. Without following the process any further,
we have already arrived at a point where, given at the start five

individual workers, we have produced 120 numerical arrangements. If these
are multiplied by the number of physical arrangements of five units that
are possible, this translates to 840 possible layouts. Clearly, in the
absence of criteria other than simple adjacency,the issue of design in
this purely mathematical sense is so complicated that the types of
bubble diagrams that result from such analysis are not uncommonly
directly translated into physical form.

The architectural community, in general, seems fairly disinterested
in contributing to a more thoughtful investigation of the organization
of space in the office. The current office buildings which are considered
the most interesting by the architectural press, like Helmut Jahn's
work in Chicago,certainly are richer in imagery and massing than the
office towers of the 60's and 70's,but at the same time one wonders to
what degree things have changed in the interior of these buildings,
aside from the provision of atriums that are often incredibly overscaled.

At a symposium held at Harvard's Graduate School of Design several
years ago, one of the panel members said that,'in purely architectural
terms', Centraal Beheer was a failure. By assuming that there is, in
fact, a communality of agreement about what constitutes 'architectural
terms', the whole discussion about what those terms are is avoided.
Discussion of issues like territoriality, and attempts to relate design
to certain values,are more often found in journals published by organi-
zations like Herman Miller. A recent issue of their journal Ideas
included illustrations from Hertzberger's building,as well as articles
by the cultural anthropologist Constance Perin and one discussing
Alexander's pattern language as it related to workplaces. Another issue
was devoted to the work of George Nelson, who began designing office
furniture for Herman Miller in 1947.Nelson describes a project he
designed in Wisconsin.

> (the organization) gave us a test area, an
> existing department in their old building.
> We got Luxo lamps and clamped them on to the
> desks. You wouldn't believe the excitement
> this caused.So I checked and found that no-
> body in Appleton, Wisconsin had even seen a
> Luxo lamp before. So that explains the interest,
> but not the excitement.So I went back and
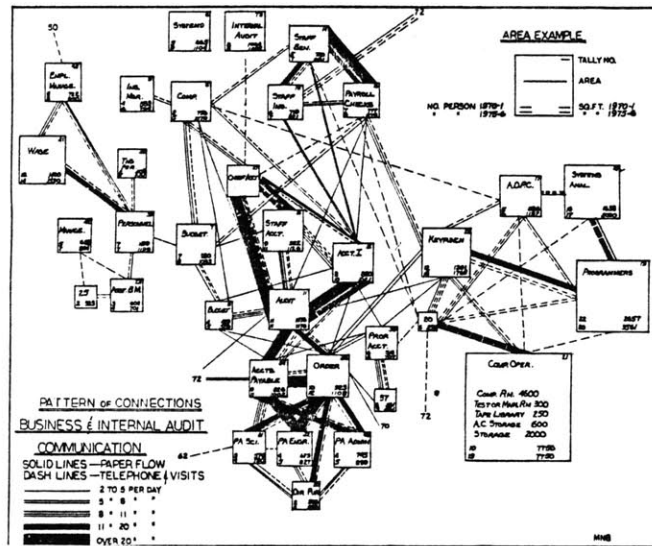> talked to these people,and what I gradually

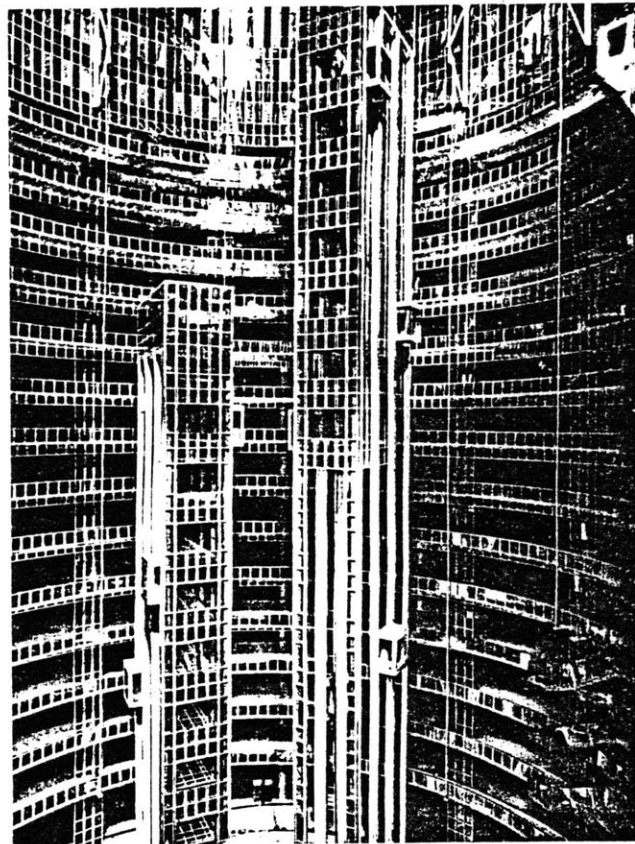fig.1 Adjacency diagram for Purdue University offices. Quickborner Team

fig.2 Model of atrium in proposed Chicago Board of Trade addition,Helmut Jahn

> discovered was that all these people felt
> quite helpless.They don't make decisions,
> they just stamp here and sign there. You
> give them a Luxo,and they can adjust it
> to light whatever they want. [1]

From experiences like this, Nelson concluded that people's satisfaction in a workplace related directly to the degree of control they had over their environment. This conclusion led to the provision of venetian blinds for workstations so that people can control the degree of privacy they have and a panel component for a worktable that has a small gap so that people can, from a seated position, have some sense of what is going on around them while preserving their privacy. While such techniques may seem trivial, the accumulated effect of small decisions like these is to increase the degree of controllable privacy and personal space that an individual has in the office. At the same time, the 'shell' in which all this occurs can be an important factor. Nelson complained of this particular installation that it had to be placed in a space 400 feet long, and concludes that; "The lesson in this is that the designers of buildings and the designers of workspaces inside should get together at an earlier stage. " [2]

Since the plan form of office landscaping is independent of any building module, with the introduction of Bürolandscaft the building shell becomes more separate than ever from the activities within. When Nelson is asked to sketch the ideal office building,he draws a series of gridded lines which float inside a circle. The building merely contains the elements without affecting them in any way.

To what degree is this situation tenable? Is it perhaps an exaggeration of the architect's importance to assume that the solution for the office environment must derive in part from 'architectural' strategies and not simply rely on better furniture design?

To a degree, a rethinking of the building envelope is now being forced upon architects. Both Bürolandscaft and office furniture systems recommend themselves to the kind of deep plan spaces that depend on a mechanically controlled environment. As energy issues become more important, the reliance on these types of buildings becomes questionable.

The largest share of mechanical energy supplied to office buildings is usually consumed by lighting,not only in terms of the supply of direct
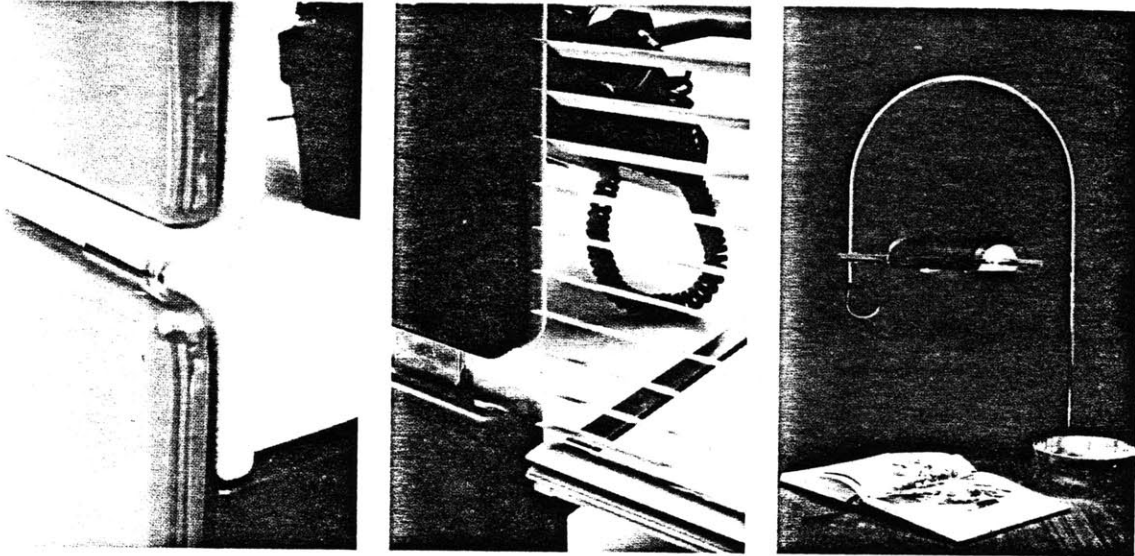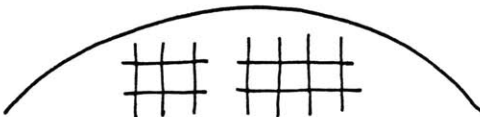
fig.3 Workstation components by George Nelson
Table with 1-inch gap,venetian blinds, adjustable lamp

a shell like this:

"Then. inside. you set up some jungle gym structures:

"And by adding partitions:

"You could have closed rooms – say, 10 x 10 – as well as wide open spaces. I think it's a good idea. I'd like to have the chance to find out what's wrong with it. And if you put these jungle gym structures at half-levels to each other:
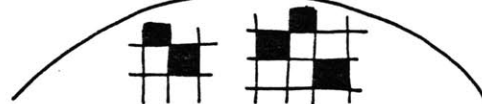
"You'd have nice views and cross circulation – it could be very pleasant. But that is just one thought about how these things could work.

"In many cases, all you mean by 'humane,' really, is interesting. For instance. that building across the street from us will never get into any art history books. It is an utterly mediocre piece of commercial trash. based on something vaguely Gothic – a mish-mash. But it provides a view that is not nearly as tiresome as one of those bland new Third Avenue skyscrapers which have nothing to look at. So you might say a more humane environment is one where there's more to look at.

"My apartment building is across from Gramercy Park, and one of my real delights is to sit on the top step of our old building in the late

fig.4   Diagram for 'ideal office building. by G.Nelson

Site 1A / Gregory Bateson Building
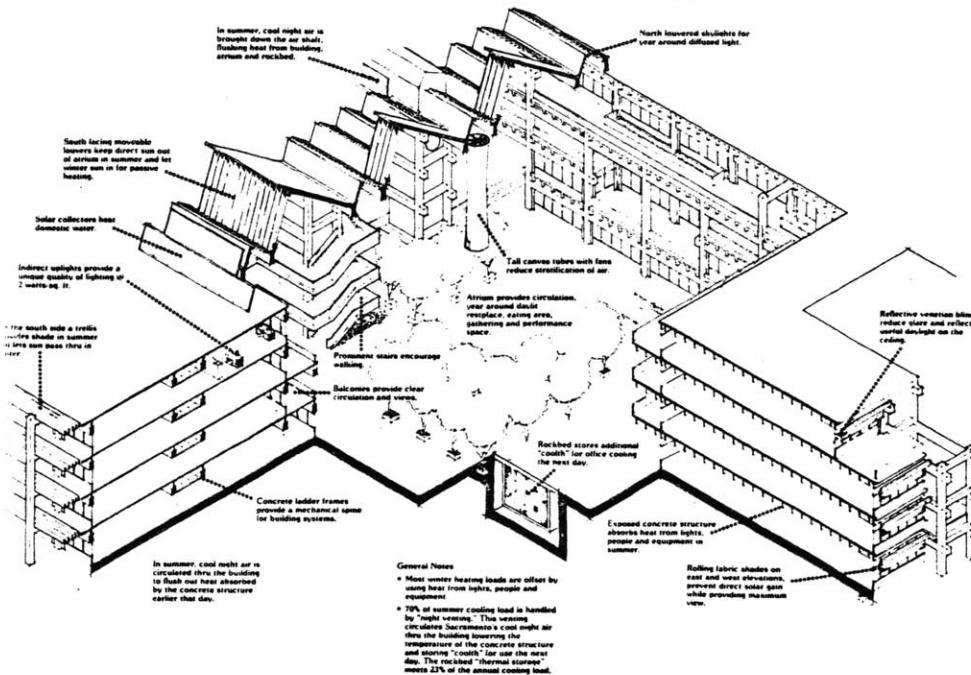
fig.7   Bateson Building, atrium

power to lighting systems, but also in terms of disposing of the excess
heat which they generate. Strategies that attempt to increase the use
of natural light also tend to produce building forms which, with their
hight perimeter to volume ratio, refer back to the 19th century office
building. Often the adoption of certain energy strategies has consequences
which relate to issues like variety and territoriality. A recent govern-
ment office building in Sacramento, the Bateson Building, illustrates
the point. Completed in 1981, the Bateson was built as the first in a
series of buildings commissioned by California's State Building Program
which were intended to be models of energy-efficiency. The central
atrium, the use of louvers as sun-control devices, the reliance on
indirect lighting and daylighting rather than general fluorescent
lighting, the prominent position of the stairways to discourage elevator
use - are all strategies which the designers of the Bateson adopted in
terms of energy use. But the strategies adopted have other consequences
as well. The atrium, unlike that of the Ford Foundation in New York or
the Deere addition in Moline, is not only a space into which one looks

fig.6   Bateson Building,exterior

fig.5   Bateson Building,Sacramento (1981) isometric of atrium

or through which one moves but also serves as an arena for public per-
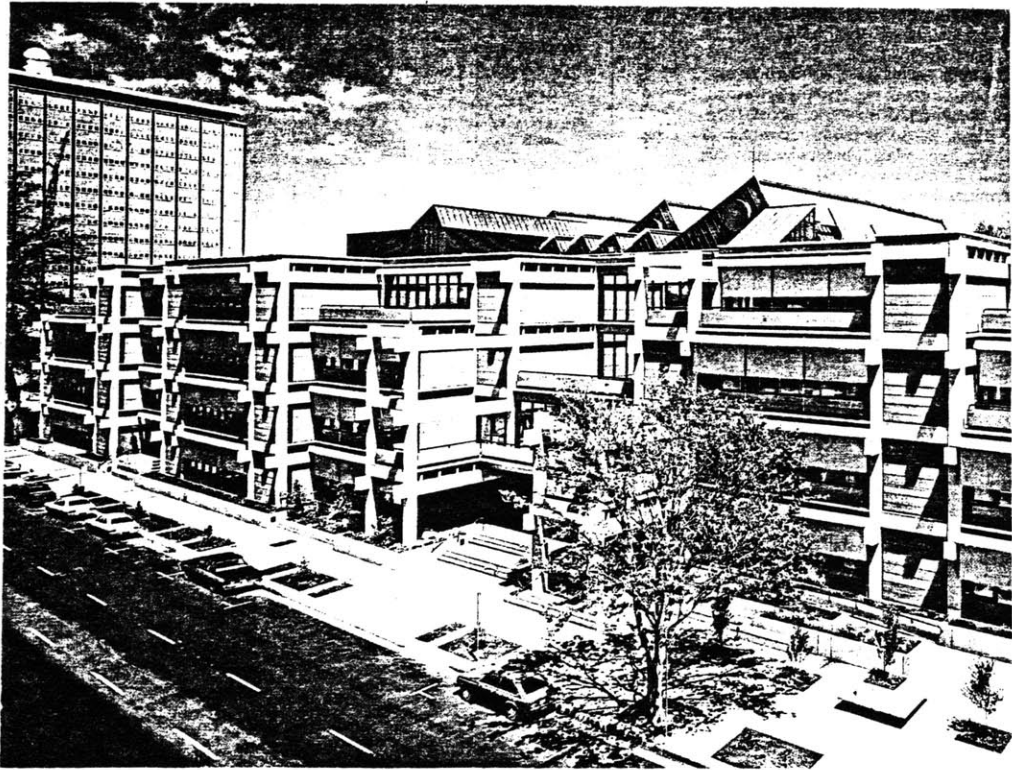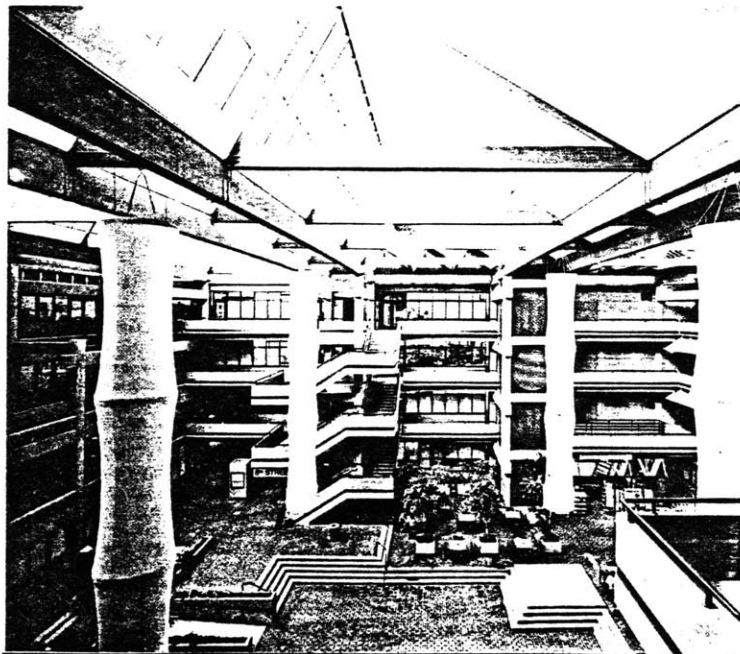formances and gatherings. Like the internal street of Centraal Beheer,
it provides a way to bring some of the life of the city into the building.
As in Centraal Beheer as well, there is a strong structure that defines
circulation and provides the spaces for mechanical services. The natural
light of the atrium contrasts with the indirect light used in the work-
spaces, while the light modulating elements, the louvers and trellises,
add further variety. Original programming had recommended the adoption
of work clusters of 12 to 24 workers, arguing that small.. groups would
be more likely to exercise the control over the building that would
make it responsive to changing external conditions, but there was some
institutional resistance and the plan was not adopted. In the absence
of a strong desire to provide more individual control for the individual,
however, solutions which satisfy energy needs will not automatically be
satisfactory from other points of view. In the Bateson, for example, the
shades covering the windows are computer controlled - since priority
was given to efficient energy use, individualized control was sacrificed
to centralized predictability.

But even without the issue being forced upon architects by concerns
for energy use, one might still argue that concerns at the building
scale for territoriality and variety add another level of definition
in mediating between the scale of the individual and the scale of the
building. Just as Nelson's desk archieved outlook and enclosure by
articulating the difference between the table support and the enclosing
element of the panel,so in Centraal Beheer, by emphasizing differences
and contrasts in an overall framework,variety is introduced which still
allows for flexibility in use. Changes in ceiling height , the use
of natural lighting to differentiate areas, the contrast between the
tall open public space and the lower private spaces, the changes in
building material from concrete to glass block, the use of a strong
structural system to define territories, were all used to provide
differentiation at the scale of the building. Such differntiation
provides the inbetween link that allows us to experinece ourselves as
part of a larger world.

In Body,Memory,and Architecture,Robert Yudell speaks of the kinds
of relationships that exist between animate and inanimate objects. A child

runs a stick along a picket fence - the regular periodic spacing of the pickets is the 'Cartesian' given of the built environment. The variables are the speed and pacing with which the child or 'musician' moves against the grid. Certain objects clearly have greater ability to provoke the kind of interplay which gives us the sense of 'belonging' in the world. Yudell criticizes the typical curtain wall skyscraper because; "Its potential for pulling us into the realm of a movement and sound game is almost nil. We can neither measure ourselves against it nor imagine a bodily participation."[3] Certainly the attempt to set up an environment which would provoke our own richness is not inappropriate.

A more general criticism of attempts to improve the work environment revolves around the issue of whether, given larger issues relating to the structure of business itself, concern with the physical environment of work only deflects attention from more important issues. If one argues for greater responsibility for workers, is it trivial to talk about providing Luxo lamps?

Hertzberger's building has been criticized on this level. Krier sees its additive organization as being a disguise for the monolithic and oppressive reality of modern business. Eisenman writes that such architecture fails to account for a new consciousness 'forced' upon the architect which precludes the continuation of a progressivist view of man. But, as we have seen, the design of the office has, in general, been characterized by the very lack of engagement that some critics see as the only possible response to contemporary political conditions. Far from serving as a radicalizing force, such disengagement has only shown the extent to which humans can adapt themselves to less than optimal conditions.

At the least, improving conditions in the workplace in terms of providing more opportunities for individual control would be the basis for an environment that is less dehumanizing. At the most, such environments might serve as models for social patterns on a larger scale. "As a table is located between those who sit around it" - the shared environment of the office, defining relationships in spatial organization, has in different forms reinforced old patterns or suggested new ones. In tracing the history of the office and the evolution of two buildings this mediating role of architecture has, hopefully, become clearer.

FOOTNOTES

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