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Record Profile:
A New System of Office Furniture

Center for Environmental Structure

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Toward a personal workplace

Portfolio of interiors and a new system of office furniture
Center for Environmental Structure, Architects

By Christopher Alexander, Artemis Anninou, and Gary Black with John Rheinfrank

For those who have persevered through its daunting 2,388 pages (and for many who have not), few books on the shelf of contemporary architectural theory command such reverential esteem as Christopher Alexander's five-volume treatise for Oxford University Press: The Timeless Way of Building (1979), A Pattern Language (1977), The Oregon Experiment (1975), The Production of Houses (1985), and The Linz Café (1982). Alexander and various co-authors advocate nothing less than "an entirely new attitude . . . intended to provide a complete working alternative to our present ideas about architecture, building, and planning—an alternative which will, [they hope], gradually replace current ideas and practices." Last November, I visited Alexander in Berkeley at his Center for Environmental Structure and discovered that, despite a flourishing building practice, he has not abandoned the critical ruminations that first brought him to our attention in the '60s with the publication of Notes on the Synthesis of Form (Harvard University Press). Alexander revealed that for the last few years he and his colleagues have been studying the problem of office interiors, furnishings, and systems, and, having found them sorely wanting, devised an alternative. I invited Alexander to offer a capsule view of his research and findings; to trace the development of his general theories through a portfolio of recently completed interiors projects, both residential (opposite and overleaf) and commercial (following pages); and to present, for the first time, his particular vision of the "office of the future."

Alexander and his co-authors call more than one generation of architects, interior designers, and furniture manufacturers to task for what they see as gross insensitivity, if not malicious negligence, toward unwitting end-users. Their immodest proposal to discard the currently accepted truths of office design and replace them with a "new attitude in which human feeling dominates" is more than provocative—it is revolutionary. What Alexander and company offer instead—the furniture, walls, and rooms they have designed for production—are, given the current state of the art of office interiors, nothing less than defiant. Charles K. Gandee

Introduction

People spend most of their time at home or at work. The house (or apartment) and the office (or workplace) are therefore the two environments that play the most significant role in people's lives. Yet in our time, houses and offices are almost universally empty of real vitality. They are missing a depth of feeling and richness of function that lets people reach into those parts of their everyday life and work that are really important. Of the two, houses are slightly better because, in a few cases, people's own idiosyncracies produce something which has some kind of life because it comes from the heart. This does not happen, of course, in large housing projects.

When it comes to offices, the disease is almost lethal. The current open-plan office has become a stereotyped environment—dry, image-ridden, . . . utterly without human qualities. Our research has shown that office workers are almost unanimous in their dissatisfaction with the places where they work.

And yet the manufacturers of office furniture, who control the modern new-office environment, continue to make products that are disturbingly similar in their tasteful sterility: cloth, steel, plastic, gray, pastel orange, brown, soft carpeting, uniform light, modular partitions, hung worksurfaces, white noise. The environment produced by office furniture has realized the nightmare of Orwell's *1984* at a level so subtle that many managers are not even aware of it. This is the deathly world that 58 million people in the U. S. are forced to inhabit eight hours a day. Producing this environment is a \$7-billion-per-year industry.

During the last few years, we have been trying to find some drastic way of cutting through this enormous problem—trying to find a way in

which office space, produced on such a gigantic scale, can get some life, can support the life of the people who work there. During the studies we have made, we have come to a number of dramatic conclusions about the nature of office environments, the nature of production, and the nature of design.

What follows is a short description of our conclusions. We are trying here to project a possible new world in which a person's work environment is ordinary and pleasant—a place to be loved, where real work can be done, a place where the plastic imagery is gone. The results of our work exist in the form of an office-furniture system conceived and designed for mass production, and now almost ready to be produced on a preliminary basis. It is unlike any furniture system now available in its hardware, materials, space conception, and design. It is intended to launch the creation of an entirely new kind of workplace. We believe that this type of furniture has the capacity to "sweep the board" in sales.

New sensibility

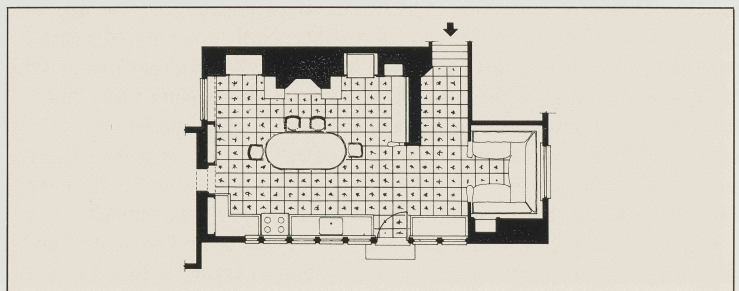
The work on this new system of office furniture is part of a general effort we have made during the last 10 years to create new environments for single-family houses, apartment houses, mass housing, public buildings, office buildings, and urban space. All these projects show a new sensibility and a new effort to make things that are more childlike, more rooted in human feelings, and more comfortable as environments: you want to be there in the same sense that you want to curl up in a corner with a pillow on a Saturday afternoon, or be in the shirtsleeve atmosphere of your own workshop.

The fundamental problem being confronted in all these places is the same: What is the nature of an environment where a person feels the weight of his own heart, the sweetness of his own existence, the sweetness of the world, and the comfort of real life, as opposed to the mass-existence and manipulated efficiency of Modern and Postmodern architecture?

These concepts are easy to grasp at a small scale, but much harder to deal with at a large scale. Nevertheless, it is at the large scale, embodied in our firm's largest building projects and new system of office furniture, that the significance of the problem and its solution reach their most important level. Especially in the area of office furniture, this represents an enormous challenge, since present manufacturing, responsible for a huge part of the environment in which people spend their lives, has not even begun to address this problem. So far, the problems addressed have been either the problem of efficiency (as in the *Action Office* and its successors) or the problem of image (as in most lines of furniture now being produced).

We are concerned with the problem of the worker's genuine comfort and well-being, and in a recent series of industry discussions, we discovered that some office-furniture manufacturers explicitly reject these concerns in favor of the opinion and comfort of the architect, interior designer, facilities manager—i.e., whoever buys the furniture.

Even workers themselves are brainwashed into believing that their emotional well-being is unavailable *in principle* in the late 20th century. For example, during the process of making the living room for a house outside San Francisco (opposite and following pages), our client asked: "Is it really all right to have this much fun?" He is a banker. The possibility that an environment could create such a joyful feeling, and yet be normal and accepted, was amazing to him. The people who work in offices have similar expectations. Although many of them hate the environment they work in, few imagine that anything fundamentally better is even possible. Yet it is just this which we are trying for in all our building projects, and in the office furniture we describe in this article—a new sensibility, in which human activity, human feeling, color and light together create an ordinary human sweetness, something almost entirely missing from the works of this century.



The San Anselmo room

An example of this is a room (opposite and right) from a house we recently completed in Marin County, California, for Dan Potash and Maureen McCabe, a young couple with one son. This room has structure, windows, and built-in furniture. Perhaps most importantly, it has hand-painted walls, with a color sensibility that is entirely missing from the work of our time. Kitchen, living room, hearth, and alcove all together, the room opens to the south onto a small paved kitchen garden, and looks west to another patio and to lawns and orchard beyond. The room is defined mainly by its windows, low ceiling, built-in furniture, and its table (we designed and built all of this). Perhaps most significant of all is the color of the room.

Very early on, I asked Dan and Maureen if they wanted to have color. They said they had liked the floor in our office, and asked for a terrazzo floor of the same kind. After experiments with paper I found out that, on the floor, the light in the room seemed to need 51 percent green, 35 percent red, and 14 percent yellow. I then invented a pattern that had the right proportions of these colors, and we made the floor.

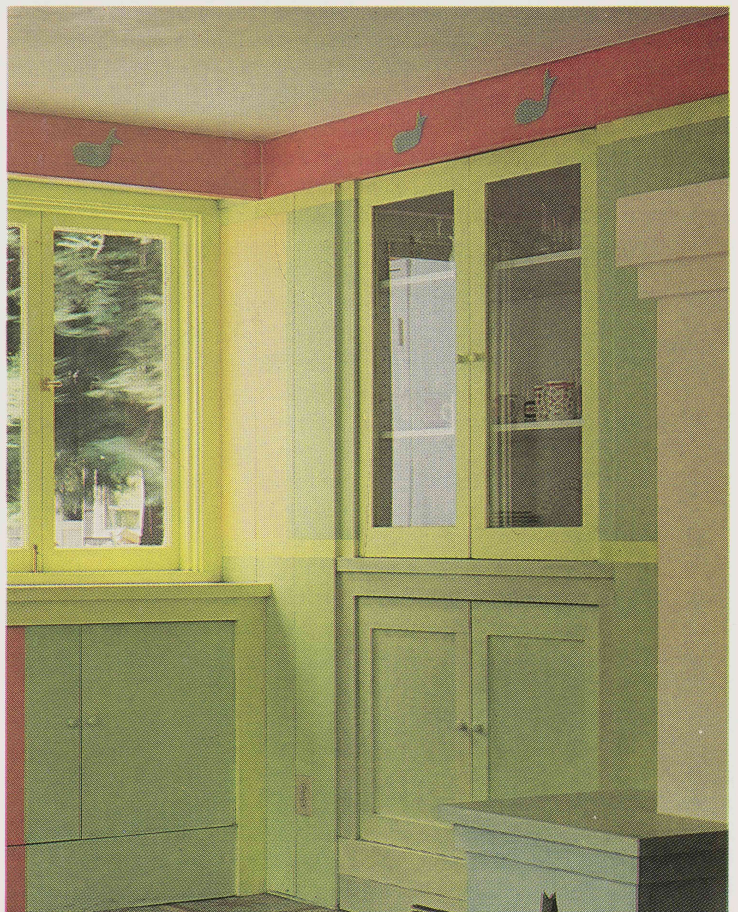
Later, when we had built most of the furniture, we came to the colors of the room itself. I had always assumed it would be mainly yellow. So had our clients. However, they asked me to find the most beautiful colors possible, so I began, once again, testing papers on the walls to find out which colors in what proportions created beautiful light. After experimenting I found that the light of the room needed a pale sea green, a light transparent yellow, a pale blackish red, a very pale blue, and a light yellowish green. After stapling these five colors to the wall to check the proportions of color and their effect on the inner light of the room, an assistant and I laboriously painted gouache on butcher's paper. Then we began placing these papers on the walls until the light in the room became as calm and beautiful as possible. We made the most elaborate color mockup I have ever made in such a situation, and at the end of our work the room was entirely papered in rough samples. We then faced the extremely difficult task of transferring these colors to permanent gouache on the real walls of the room. To appreciate the difficulty of this process, one must remember how sensitive color is to minor disturbances. It was impossible, for instance, to take down one of the mockups and build it again, because details of configuration and dimension critical to the eye would get lost in rebuilding. The colors were also incredibly hard to match. We prepared the walls with gesso and then placed a wash of gouache over it. Achieving a slight transparency, which gives the color its light, was technically very difficult. It took days to match each of the colors, which vary in different parts of the room and which were mixed and matched, originally, by eye. Getting the colors right took two or three days for each of the five colors. It must be emphasized that the kind of color harmony achieved here cannot be realized by matching from a chart, or by using proprietary colors or formulas. As a final touch, I cut the whales and dolphins out of hand-painted blue paper, glued them on, waxed them, and varnished them.

I believe we succeeded to some extent. The color is neither bright nor garish. The amazing thing is that even though the room has five colors on the walls, in an arrangement that many people would consider wild, it is in reality calmer than any other coloring I was able to find and calmer than almost any room I know. The apparently wild color, which is really quite subdued in its harmonies, came about because I placed the paper in a way that was not only calm and quiet, but also full of life.

This room is an example of what we mean by the "new sensibility" or new awareness which we try to put into our houses and public projects. We use it as a starting point to illustrate concretely what we are aiming for in the new system of office furniture.

A new system of office furniture

We now come to the problem of office furniture. The system we have been developing is entirely unlike the example of the San Anselmo room because it is intended for mass production. It is capable, in principle, of creating the environment for millions of workers, in an endless variety of specific configurations. Nevertheless, its essential aim is exactly the same as the San Anselmo room. It is intended to produce places where people feel *normal*, where people feel themselves, as people, with all their human foibles, deficiencies, oddities—everything, in short, that makes life ordinary and worth living. To do this we have tried to define a complete system of furniture that would satisfy people in the workplace in a way that is entirely different from today's technocratic environments. We posed the question: "What would the office be like if



people felt as comfortable while they are working as they do in their own homes?"

The system we have designed to answer this question has the following key features:

1. It goes beyond the worksurface/chair/filing cabinet approach and takes full responsibility for the work environment as a whole.
2. It has about 50 components, of which approximately one-half are freestanding pieces (with the balance a series of thick wall panels and other enclosure elements such as floors, ceilings, and doorways). For reasons that will become clear later, most of these components are designed to be manufactured in a wide range of dimensions.
3. We have a layout process that enables groups of workers to lay out their workspaces for themselves, and another layout process that enables each individual worker to lay out his own workspace within the group design, according to his own needs. For simplicity, speed, and efficiency, both layout processes are available on a computer disk.
4. The system has a unique set of "thick wall" components, which are premanufactured stable structures, out of which the rooms are made and which have the solidity and flexibility of design that allows a "custom" atmosphere to be created.
5. Lastly, and perhaps most importantly, the actual pieces of furniture—their design, feeling, and physical character—are entirely different from the kind of furniture now being used or manufactured.

After years of pretesting this material, we are convinced that the physical character, the "style," the feeling, color, and surfaces of the new items of furniture are the backbone of what we have done, and perhaps the necessary framework for any attempt to make a system of mass-produced furniture that is capable of "going to the heart."

The archetypal character of office furniture

If we decide to make an office-furniture system that is truly responsive to the needs of users, then the individual items must have a special character that is not clearly predicated by any other thing. We take it for granted that people should be able to imagine the workplace they want, and that the "system" is then capable of responding to and implementing the workplace they have imagined. If we take this requirement seriously, it places an unusual demand on the system. It may be explained as follows.

When a person forms a mental picture of his ideal workplace, this picture will always be made up of elements we may call "archetypal." For example, if a person visualizes a desk, the desk he visualizes tends to be an archetypal desk—a desk which is full of *deskness*. This puts it in a childlike way. However, the psychological requirement is real. If the desk that is actually available in the system is a flat plate hung off a partition, then it will *never* correspond to the thing the person imagines when he imagines his ideal desk. Thus the system and the person imagining ideal workspace for himself have parted company. If the system is to keep company with the user, and satisfy that person deeply, then it must be made of elements corresponding to the archetypal images a person has inside his mind.

One possible objection is that the images a person carries in his mind are variable, they change with style from decade to decade. According to this view, the fact that a person has an image of a so-called archetypal desk is just a throwback to the 19th or some other century, and as soon as people "catch up" with 1987, they will begin to have an image of a flat worksurface cantilevered off a partition. It is precisely this assumption that is fundamentally untrue. Research in images and archetypes makes it clear that these "modern" idioms do not inevitably replace the old ones. For example, in one famous experiment, children who grew up in apartment houses in France and had spent their whole lives in the environment of buildings with flat roofs *still* drew a small house with pitched roof and chimney as the archetypal house of their dreams. The problem with the desk is similar. When we speak of an archetypal desk, it does not mean a desk that physically resembles or imitates an old desk. It is simply that some things have the recognizable and fundamental character of a desk, and allow people to form a relation of the kind they would like to form with "their" desk.

The desks that we have proposed as part of the office-furniture system have this character. One has a sloping top and a back with pigeonholes (opposite, bottom left). The other is flat, almost like a table, with shallow drawers (opposite, top right). Thus they are quite different, but both have an archetypal character. When people see these desks, they tend to say, "I have always wanted a desk like that." This is what we mean by the archetypal character. It is a thing that

evokes the response, "I have always wanted an X like that." In the system we have proposed every element has this archetypal character.

The archetypal character not only means that it corresponds to some image in the user's mind—some very ancient image—but also that the thing has a fundamental, practical character that almost cannot be improved upon. For example, consider the low bookshelf with drawers (opposite, bottom right). It has a flat top with an elevated surround that keeps things from falling off. The wide, open shelves allow for a great variety of papers, books, and packages without any unnecessary complexity. The three drawers provide space for a few things that need to be put away in a less dusty or less vulnerable place. Altogether, this is a fundamental and practical object. If you have one in your workplace, it makes you feel comfortable and solid. The comfort is much more than skin deep. It is a fundamental comfort that comes from the fact that you have something basic, solid, and practical around you. An ordinary workhorse. You can rely on it. There is nothing to go wrong. And it makes you feel comfortable not only because it is so practical in the obvious sense but also because it reminds you of the best and most uncomplicated part of yourself. We believe that all the items in the new furniture system must have this character.

It is not hard to see that this "archetypal" character is absolutely part and parcel of the user-layout process. If we want a person to feel free to imagine a simple and practical work environment for himself, he will, most naturally, build up his mental picture from archetypal elements or objects. If the elements in the system all have this archetypal character, the system will perfectly fit his mood when he tries to define his own workplace. As a result, any minor technical inconveniences or hitches that develop during the process will seem minor because the essentials have been satisfied. On the other hand, a system that tries to satisfy a user-layout process but fails to have this archetypal character will easily irritate the user. If the slightest thing goes wrong, the errors will ultimately not be solvable because the system's elements do not have this fundamental archetypal relationship to the person. If the system does not satisfy him at this essential level, then the details are unimportant. It will never really seem quite right.

Actual furniture

The furniture itself is entirely different from furniture systems in current use. Much present-day office furniture feels uncomfortably slick and cheap. In order to create a new line of office furniture in which a person's feelings and well-being are the central focus, we changed the actual character of the furniture completely.

The key to its character is quality—genuine quality, the kind that can be perceived by everybody, the kind that cannot be faked. At the most basic level, the furniture is designed not by slickness of line, not by image, but by the quality of working, performing better than any other.

The pieces of furniture are personal in character, rich and clear in their form and color. Each piece is characterized by its emphasis on detail, accuracy of dimensions and shape in every curve, corner, and edge. Materials are real and solid. Color is life-giving, not neutral. All in all, the pieces are made of simple materials, made with great feeling, and with a variety of materials that emphasize human use and comfort. After preliminary field testing we have found that these items provide an entirely new level of comfort and convenience. The main thing is that they provide genuine dignity. Your work is not an aggressive money-making interlude in the middle of the day, but a part of your life. The feeling you have when you work in the environment created by this furniture is that you are free to work.

The user-layout process

The essence of this new system of furniture is that it is intended to make people genuinely comfortable and able to work with enjoyment. This cannot happen if a person feels like a pawn in someone else's game, a cog in a machine. It requires that people are able to define their own workspace for themselves. In order to make this practical, we have devised a new layout process (related to our previous work in pattern languages and generative systems) which enables people to lay out their own workspace. From the outset, the process also builds in the new space conception we have described.

[The following pages present a selection of the individual components in the authors' new system of office furniture, after which they continue with their discussion of "The user-layout process." Text continues on page 138.]

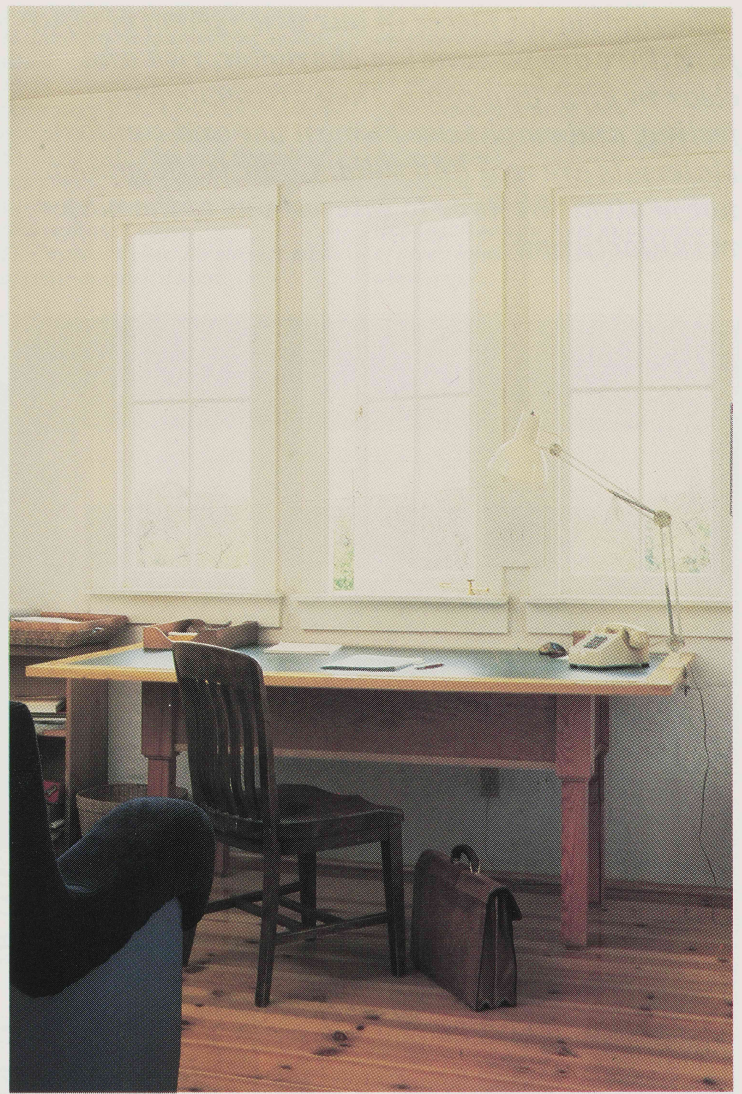


In Alexander's words: "The photographs on this page show parts of our office in Martinez, California, where we use prototype versions of many of the new items of furniture we have designed in sample situations.

"Because of our contracting business, we have our own workshop in Martinez. During the last few years we have had a continuous, ongoing program of design, experiment, construction, and field-testing, to find out which of the

pieces of furniture are really useful and comfortable. We start with cardboard mockups, then functioning plywood mockups, then more and more realistic working versions of each piece. When an item finally gets good enough, it becomes a permanent part of our office, and we can then watch it in operation even more closely.

"The black rolling table [overleaf, figure 7] has existed in at least four versions during the last years. Although it appears ultra-high-tech,



it is extremely comfortable, and everybody in our office (and in other offices where we have tested it) wants one—because it is so convenient. The tall red desk [below left], though so appealing to look at, has not yet reached the same level of comfort; its practical comfort does not yet match its elegance or the sensuous quality of its materials. On the other hand, the flat red desk, which is more cheaply made [top right], is unbelievably comfortable—perhaps our most successful piece so far.

"Other pieces that we are currently testing include filing cabinets, screens, curtains, lights, tables, and, above all, the all-important problems of manufacturing, assembling, and re-assembling thick walls [top left and overleaf], so that they can be moved, rearranged, and rebuilt, but still keep their solid, custom character."



“The individual pieces in our new system of office furniture are personal in character, rich and clear in form and color. They are made with feeling, and emphasize human use and comfort. Materials are real and solid. Color is life-giving, not neutral. We hope to interest one of the major manufacturers”

1. Low bookcase of white enameled wood, with a flat top, elevated surround, and fixed shelves made-to-order.

2. Work sofa: This heavy blue corduroy sofa encourages upright posture and is compatible with worksurface heights.

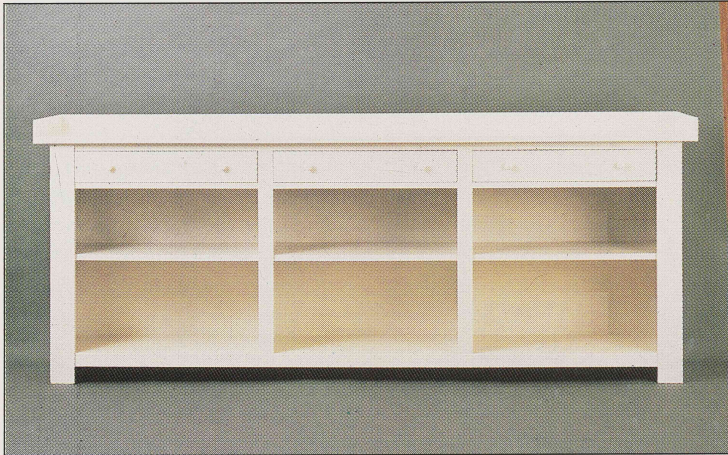
3. Thick wall panel with shelves and counter: This enameled wood unit has shallow shelves, deep drawers, and a varnished wood counter.

4. Thick wall panel with built-in sloping catalog counter.

5. Thick wall panel with built-in work counter.

6. Upright desk made of red lacquered wood contains shelves and pigeonholes, and has a sloping writing surface. A brown leather writing surface is set into the top.

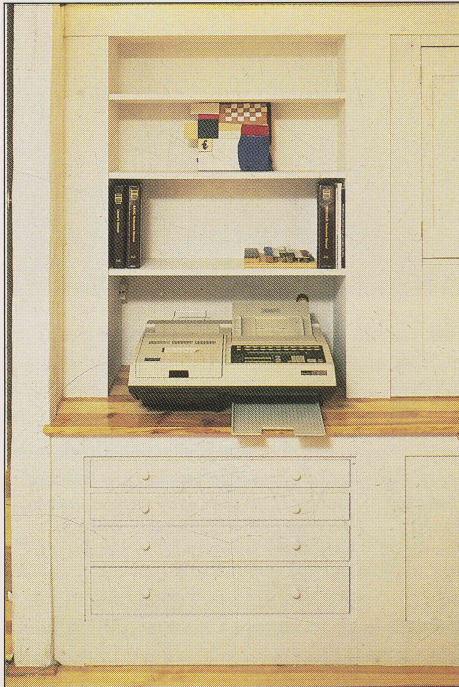
7. Rolling side table: This side table with heavy brass castors has an easy-cleaning black plastic surface.



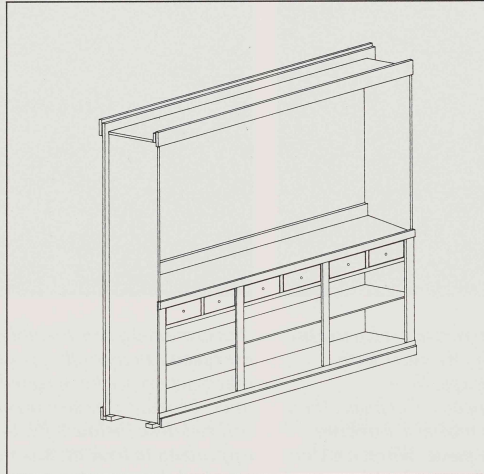
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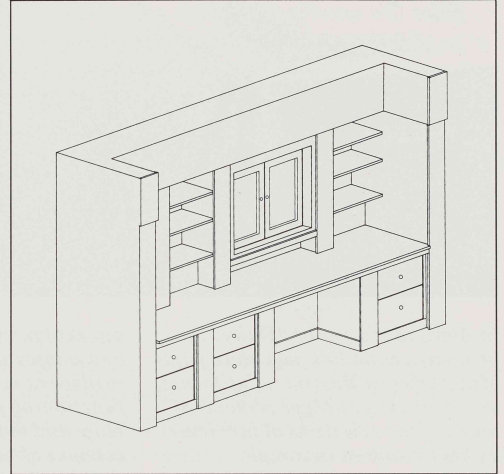
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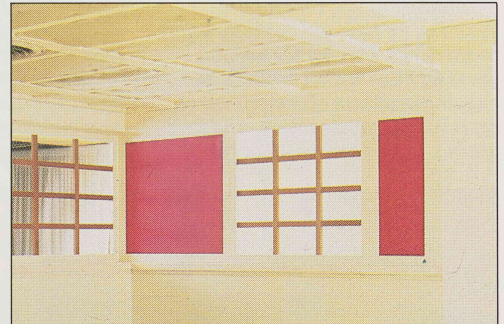
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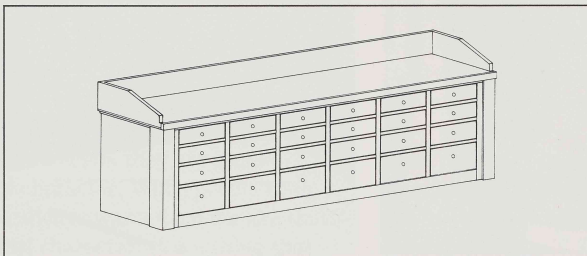
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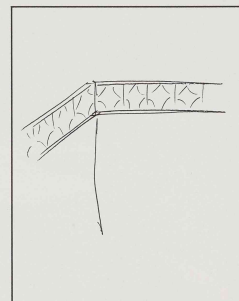
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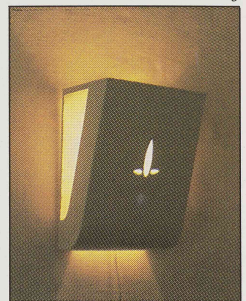
11 Artemis Anninou



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10 Artemis Anninou



13 Artemis Anninou

8. Sliding screens made of red watered silk over a wood frame.

9. Frieze with patterns.

10. Wall cove light: This fixture, made of white enameled metal with frosted glass on the sides, has a cut-out ornament on the front.

11. Flat ceiling with geometric patterns and hand-painted flower ornament.

12. Counter with drawers, and elevated surround on top surface.

13. Lightweight chairs that can be made in a variety of shapes and sizes to fit the user.

14. Series of storage compartments high on the wall.

15. Floors: The floor is constructed of varnished pine blocks in a variety of patterns.

16. Rolling black cabinet with drawers.

17. High-quality flat-topped desk: This red enameled structure has a

gray laminate worksurface inset.

18. Doorway manufactured as wall panel.

19. Thick wall: This unit is made of three panels, with built-in drawers, shelves, and cupboards.

20. Thick wall: This unit is made of two panels, with a built-in counter surface, drawers below, and shelves and cupboard above.

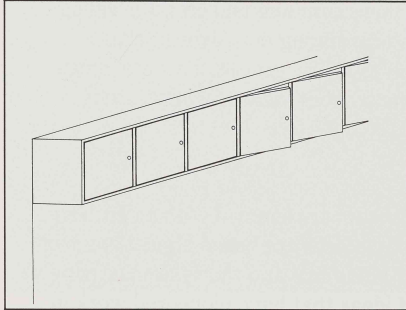
22. Alcove front: A curtainlike enclosure made of deep red corduroy with tie ribbons.

23. Pinboard made from particleboard covered with handmade Japanese silk.

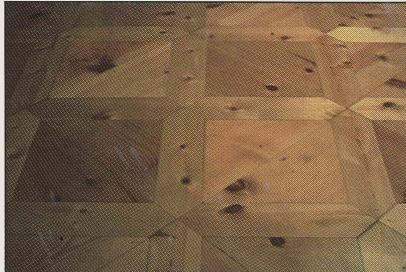
24. Armchair.

25. Sliding door.

26. Conference table: This varnished wood table has an inset worksurface of green laminate and a pronounced overhang.

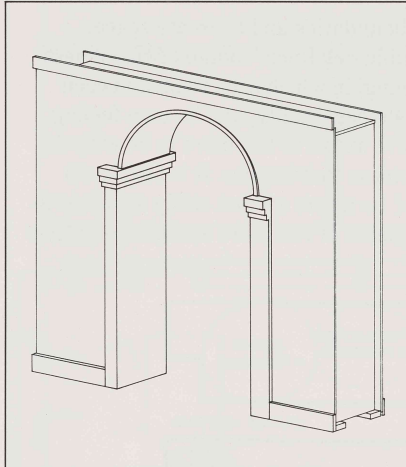


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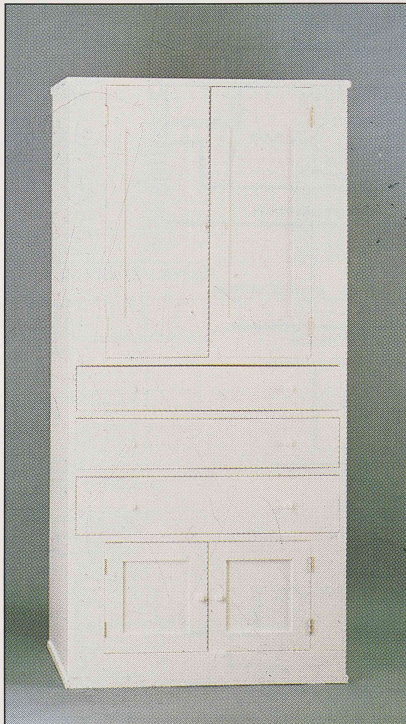


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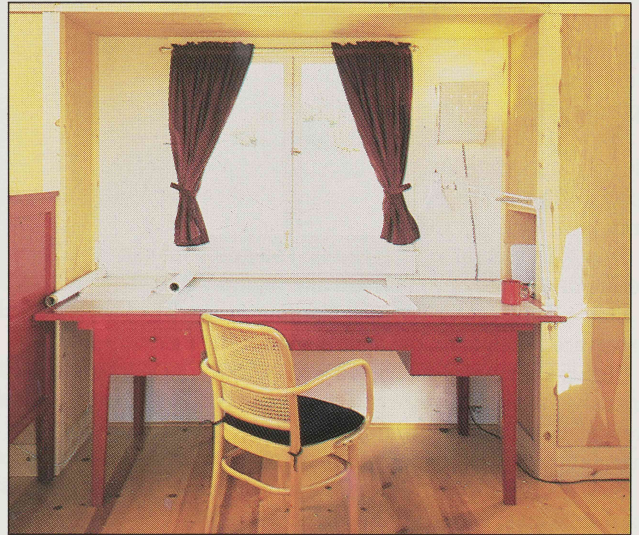
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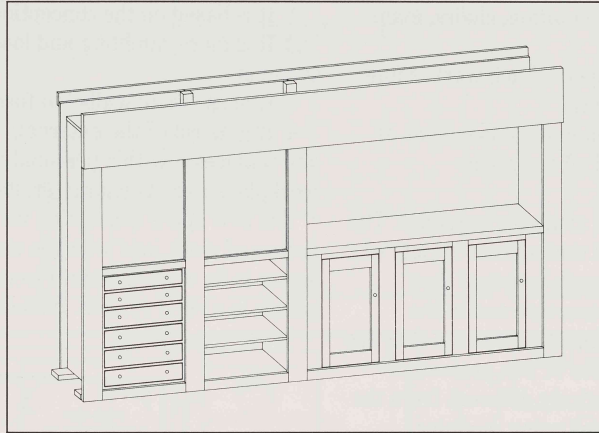
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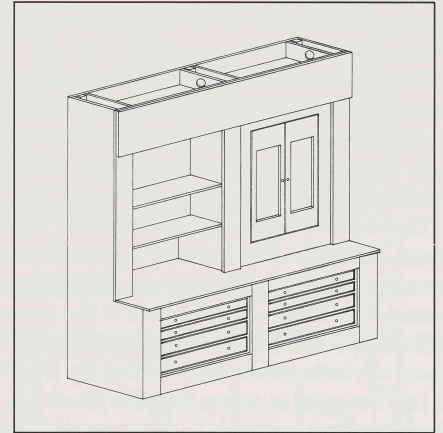


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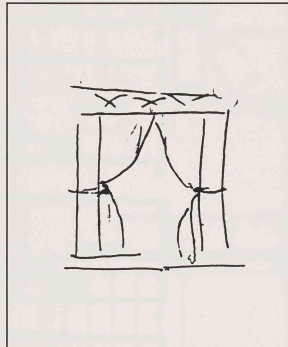
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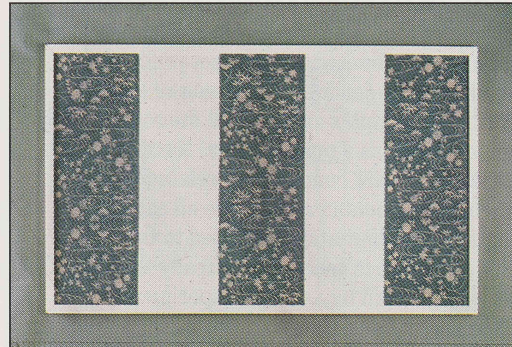
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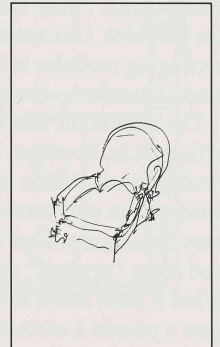


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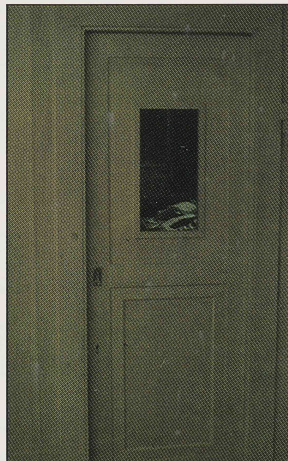


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Our user-layout process has three levels: 1. Layout of the whole office. 2. Layout of a department (5-20 people). 3. Layout of the person's individual workspace.

We built a sample installation as an experiment: an office for the administrative headquarters of Sweet Potatoes, a children's clothing manufacturer in Berkeley (opposite). The installation is in the upper floor of an old warehouse. There are two partners and 11 employees. We began by showing the owners and their employees a written version of the layout process together with a catalog of available furniture components. The following sequence (below right) describes the layout process that was then used for the installation.

Step 1: Definition of work-groups. The three group managers (design, administration, and production) are asked to decide the best working groups, the number of people in each group, and the approximate size of space each group will occupy.

Step 2: Definition of common space. The employees are asked to identify and locate the size and nature of common areas. These are specified by the program to be about 15-20 percent of the total available area.

Step 3: Definition of boundaries. The group managers are asked to decide the degree of connection and separation between groups.

Step 4: Main center for each working group. The people in each work group are asked to fix the main center of their group space.

Step 5: Location of individual workplaces. The workers in each group are asked to work together to choose the position of each person's workplace within the group. The program asks for three things: size, orientation, and degree of enclosure of each individual workplace.

Step 6: Choice of furniture for common space. The owner is asked to locate the main furniture for common spaces.

Step 7: Main centers within the individual workspace. Each worker fixes the main points in his workspace: desk, orientation, chairs, main shelves, and cabinets.

Step 8: Minor centers in the individual workspace. Each worker fine-tunes the workspace by means of minor elements.

Step 9: Measuring furniture. From the final layouts, dimensions of each item of furniture to be used are measured off the given configurations and placed on the order list.

The above nine steps are only part of the full available sequence. The plans, sections, and elevations (opposite) reveal that a great variety of spaces results from this process. The space is more personal than conventional office layouts, both in the group structure and in the individual structure. Knowing how to make a furniture system that has these attributes is the trick behind the whole idea of this process.

It is essential to stress that this process is entirely different from the layout process available in computerized systems using modular components. These systems allow the user to arrange and rearrange the modules. Our research shows that any process of arranging and rearranging modules is fundamentally limited, and cannot produce the kind of comfort—the deep and simple feelings—that we are seeking.

The reason for this limitation is complex and beyond the scope of this article. It is, however, demonstrable (as a mathematical theorem) that profound adaptation in which things are comfortably related to one another can only occur when the elements involved are all capable of very fine dimensional variation. This limitation is related to the looser and more "organic" quality of the space conception already described. What it boils down to may be explained by a simple experiment. If we give a person a certain office and then ask him to make a comfortable arrangement of furniture with pre-ordained modular components inside that office, it will be very difficult, and most often impossible, for him to reach a comfortable solution. If, on the other hand, we allow him first to place things he needs roughly (without reference to their size)—first simply putting them in position, and only then defining the sizes and dimensions of the pieces he needs in relation to the whole configuration he has created—then it is possible for him to reach a very high level of comfort and efficiency. The crux is that these pieces can then be made in dimensions that fit the particular circumstance. This "non-modularity" theorem is fundamental to the layout process.

The aspect of the layout process itself which is necessary to make this non-modularity work is that it is a process of differentiation (similar to the process of embryonic development) in which the parts are gradually differentiated from the whole—instead of the whole being made up from modular parts. It starts from the whole as one space, proceeds by dividing it into departments, then into large rooms, and then determines the locations of workplaces, then their shape, then the

location of the items of furniture that make the workplace, then *their* shapes, and, finally, their dimensions. This is entirely different from the mechanical "modular" layout processes that can easily be realized in computerized systems. An organic and lively feeling comes about because the process lays out the large structure and then creates the smaller differentiations within that structure. It is the process of differentiation that is necessary to obtain the kind of feeling represented here.

We also found that the layouts produced by this layout process are more fulfilling for the user, and much more profound in the way they are experienced, than the layouts that can be produced by conventional methods. The process itself is also more fulfilling and creates feelings of participation, ownership, and dignity among employees. It also increases feelings of cohesion in the workers' groups. These feelings are of immense importance from the point of view of workers and management.

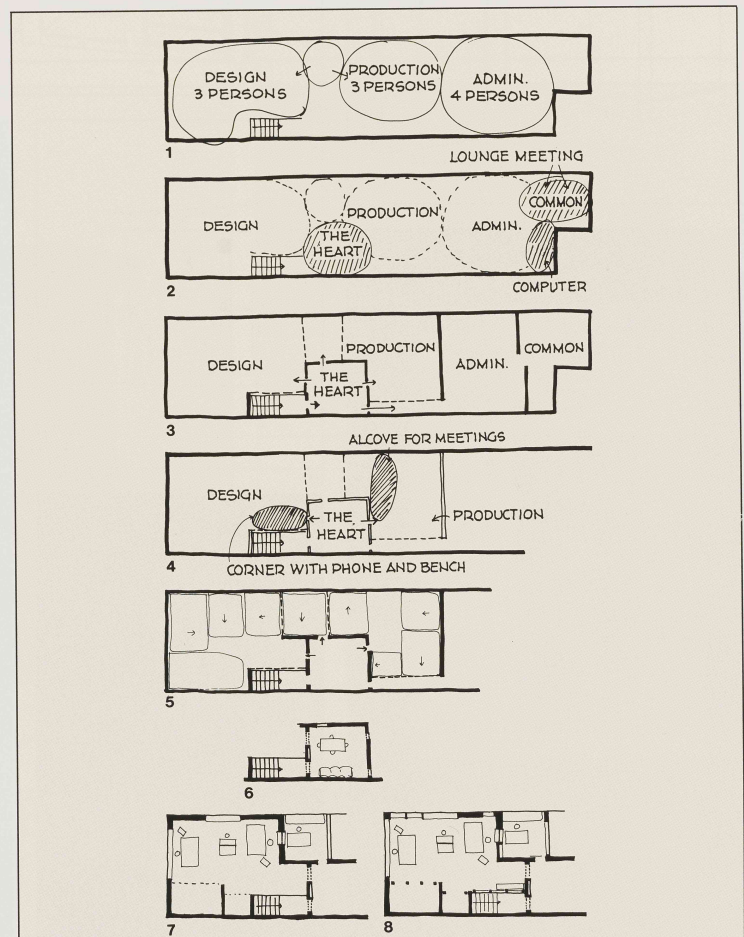
New conception of space

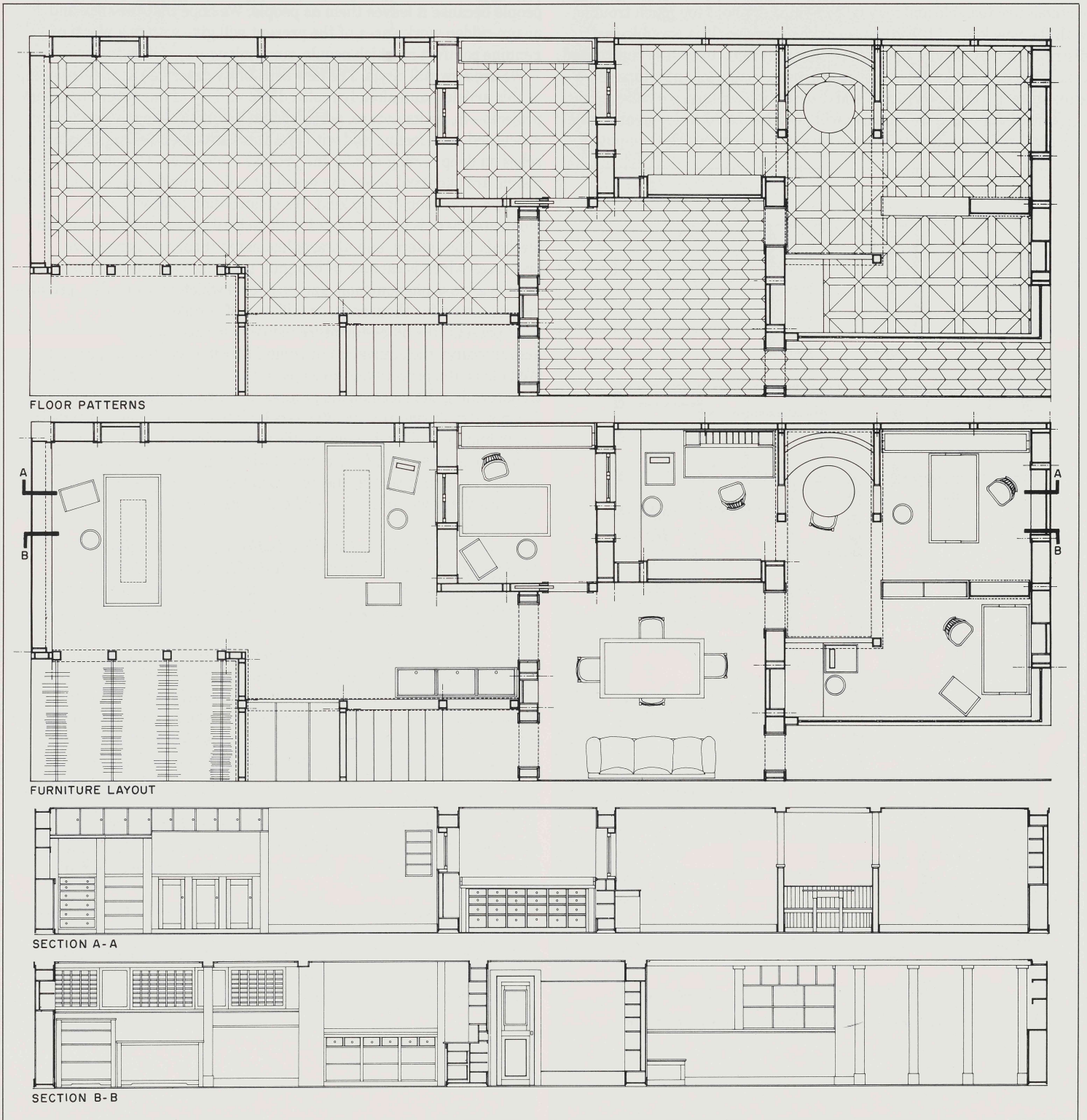
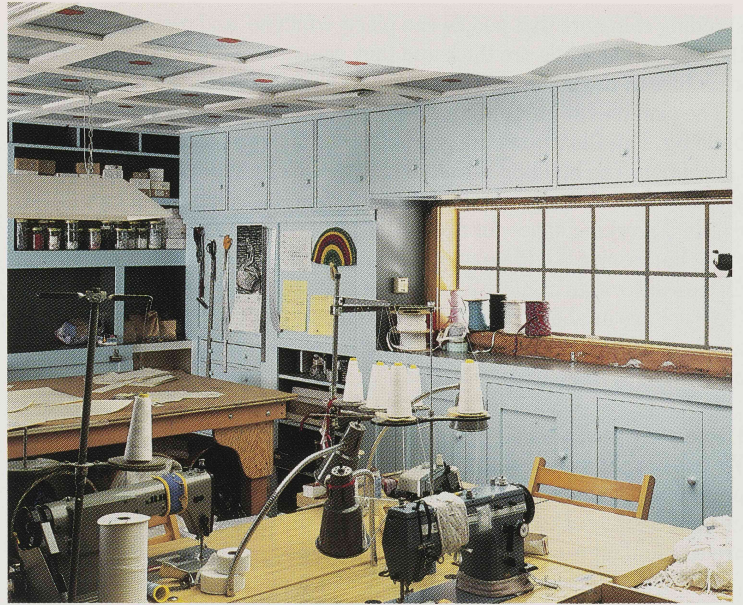
Our layout process and furniture system are coupled with an entirely new conception of space. Present-day offices are based almost entirely on the conception of the open-office landscape and the system of panels and components, the two dominant ideas that have pioneered work in office design over the last 30 years. However, there are abundant and serious failures in this kind of environment. In our interviews, for example, we found that people frequently felt isolated or, worse, as if they were in a rabbit warren or rat maze. We also found that people's productivity and energy for work are entirely different in new offices and old ones.

Very roughly, we may isolate four main features of the space conception inherent in our new system:

1. It is based on the conception of rooms.
2. It is more rambling and looser in its character than existing systems.
3. It uses "thick walls" to form boundaries and to create space.
4. It gets rid of the external, "public-relations" image of cleanliness and replaces it with a personal feeling, in which each room and each workplace gets its character, its own personality, and its own feeling.

The new space conception we have aimed at has more to do with the nature of work, and with the messiness that implies. It is also much looser in its organization. Pieces of furniture are not stiffly attached to panels in a rigid system. Instead, pieces of furniture are loose and free-





standing elements that people can place, combine, and recombine as they wish. The walls are thick and they connect with the existing structure of the building. They enclose space in all dimensions.

The plan (below left) shows a floor in a typical multistory office building. This illustrates the geometric character of the new space conception. The building is assumed to be 180- by 118-feet, which is typical for a contemporary high-rise building, and the floor shown contains working space for about 120 people. The watercolors (opposite) show impressions of the physical character the space might have, if carried out within our system of furniture. The plan and watercolors together are intended to give an over-all sense of the character and atmosphere such an office might have, given the nature and capabilities of the new system.

Large-scale production

We have spent a good deal of time preparing for the large-scale production of this new system of furniture. The furniture itself will need new kinds of tooling, especially since the materials and finishes are unusual (at least by present industry standards). Furthermore, the fact of the dimensional variation hinges on a number of technical maneuvers not described in this article. In any case, mass-production methods are feasible and may be combined, without too much trouble, with the new kind of furniture we have described. It is possible that distribution and service of the furniture may need to be less centralized than most current systems. Although many major manufacturers already keep local showrooms and distribution centers, we believe that the kind of furniture we envision will need further development of this decentralized system of sales, marketing, and service. The computer

programs used for layout will be linked to sales and distribution. Since this represents a project of considerable scale, we believe it will be best to begin by manufacturing a small number of pieces of furniture each year (four to six, perhaps) and then slowly building up the repertoire of available elements. This is an almost risk-free method. As the number of available elements grows, the more sophisticated aspects of user-layout and local service can be brought in line with the demand.

It is our hope, and our goal, that this system of furniture will gradually reshape the industry. The individual elements, the process of user design, and the space conception described above are all feasible and practical for the very large buildings that now exist. We believe that the system and furniture described above are as suitable for high-rise buildings in New York and Chicago as they are for low-rise buildings in Phoenix or Los Angeles. The clincher is in the comfort and pleasantness of the furniture, and of the space that it creates. In field tests we find that the furniture creates an entirely different *human* relation between people and place from the one most people are used to today.

Instead of being alienated, and trying to tolerate the work environment, people feel as comfortable with this furniture as they do in their own homes. It creates environments that bring out the best in people because it leaves them *as* people. We hope that the slick and image-ridden workplaces of the present will give way to a world of genuine comfort in which people can think, work, and be themselves.

We are now full circle. The new sensibility described at the beginning of this article—and already realized in a variety of our recent building projects—is, by its nature, personal and unique. It is non-mechanistic, concerned with feeling and with life. It creates deep feeling because it relies on deep feeling during the process of creation. Of course, some people are skeptical about the possibility of capturing this quality in a mass phenomenon of *any* kind. We believe that what we have illustrated here is a marriage of high technology, modern production methods, computers, and ultrasophisticated theory of generative processes which is capable of bringing these human qualities to light, even in a mass phenomenon, and on a level which will, one day, produce environments for thousands, or millions, of people.

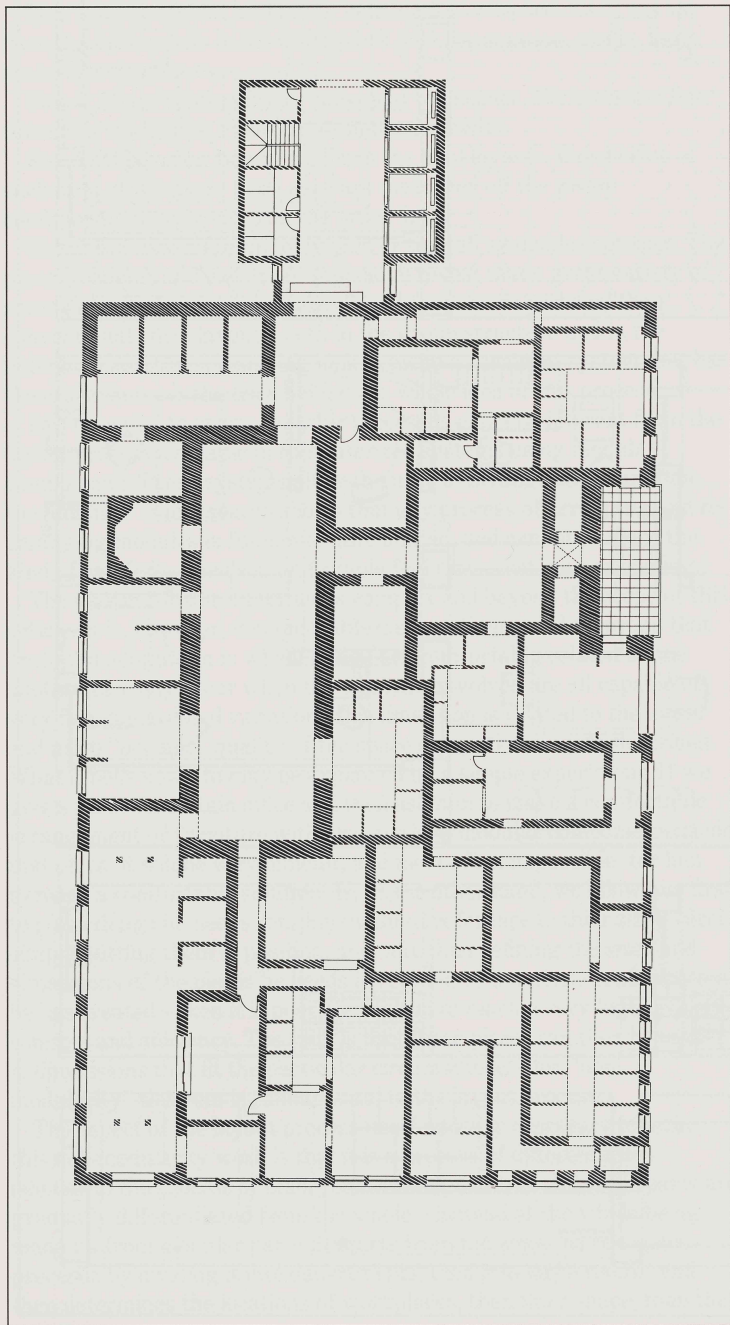
At present, the office-furniture industry in this country manufactures the equivalent of some 742,000 workstations per year. We believe the process and concepts we have shown here are capable of transforming the mechanistic process and attitude that has dominated the industry during the last 30 years by introducing a new attitude in which human feeling dominates. We are convinced that this new attitude can be successfully married with large-scale technological transformations, and that the new furniture that we have described here has the power needed to make this transformation.

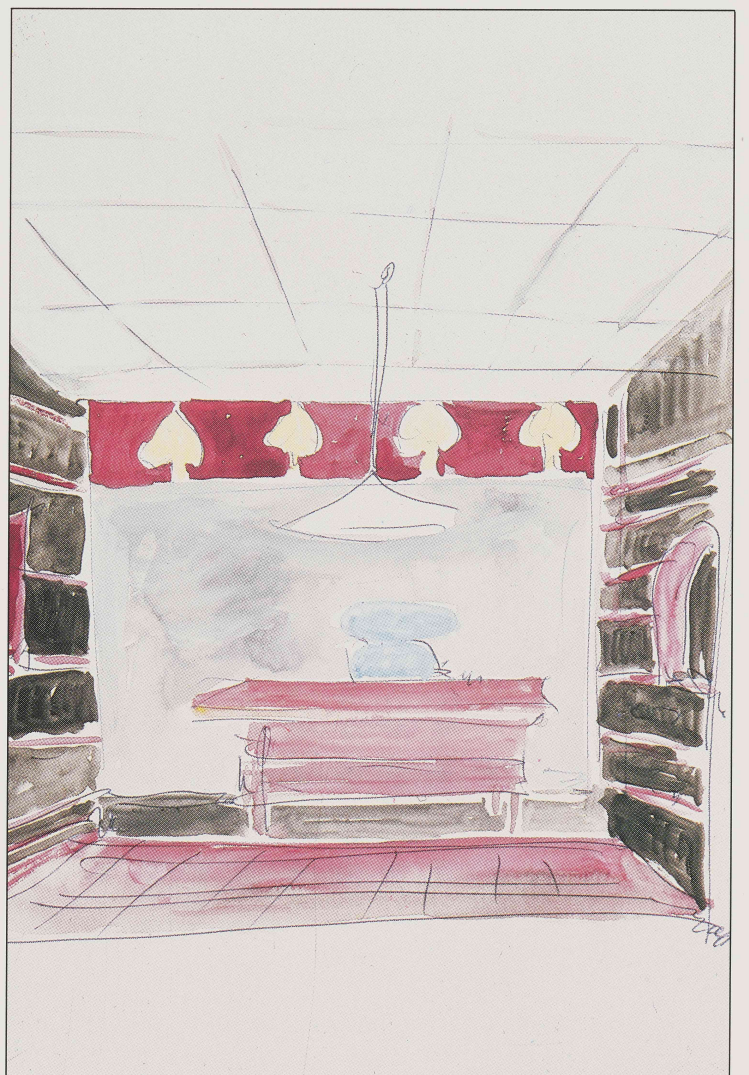
Some parts of the work described in this article were done in communication with the design staff of RichardsonSmith, Columbus, Ohio. Credit is also owed to other companies, including Patagonia, Inc., Sweet Potatoes, the Xerox Corporation, Philips n.v., and to individual clients including André and Anna Sala, Dan Potash and Maureen McCabe, and Ann Medlock and John Graham. Among them, they have given us the opportunity to conduct an almost continuous, in-depth inquiry. We should especially like to thank Dick Haworth, whose ideas for a new and vital workplace have been an important influence. Through his patronage, he provided the first opportunity for the Center for Environmental Structure (CES) and RichardsonSmith to work together. We should also like to thank Tom Hench for his encouragement.

The following members of CES are responsible for the design and construction of the San Anselmo room: Christopher Alexander, Gary Black, Mark Briner, Chester Cervellino, Stephen Duff, and Kleoniki Tsotropoulou.

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The watercolors are by Christopher Alexander.







Center for Environmental Structure
2701 Shasta Road
Berkeley, CA 94708
415-841-6166