Designing for Children
Another fine floor from Azrock

Here are four new “today” colors — bright, bold, vivid — in one of today’s finest commercial floors — Azrock vinyl asbestos tile. The color-chip styling is distributed through the full thickness of each tile. Design and specify with confidence exciting custom floors that can be installed in heavy traffic areas. In 3/32” and 1/8” gauges, 12” x 12” size. Six other Custom Cortina colors in tints and tones of spice are also available.

America's leading vinyl asbestos tile AZROCK®

Consult Sweet's File or write for samples. Azrock Floor Products, 552A Frost Building, San Antonio, Texas 78205

On Reader Service Card, Circle No. 328
Two sure ways to fill a security gap

Weather, fire, debris and unauthorized people all offer a real challenge to building security. Kinnear recognized these challenges years ago and designed doors and grilles to effectively answer the protection needs of buildings for retail business, industry, entertainment, education, public service and many other enterprises.

The compact coiling capabilities of the interlocking slat curtain developed by Kinnear remains the most all around reliable system for highly efficient metal doors — and it's never been excelled! The combination of positive, quick operation and compact “above the opening” out-of-the-way storage has proven the effective solution for service, space economy and ready protection.

Where a doorway or store front needs “solid” coverage, Kinnear Rolling Doors form the ideal barrier. Here is where the rugged quality of Kinnear pays off with construction features that defy wear and weather. They are adaptable to a wide range of big or small openings. But they also present a neat, clean appearance that harmonizes with modern building architecture.

If vision or ventilation are to be maintained, Kinnear Rolling Grilles will discourage trespassers while still keeping displays in view of the passer-by and after-hour shopper. Upward acting Grilles are completely hidden when open. No floor track to collect dirt or offer a stumbling hazard is required. And, there's a choice of Grille designs to fill various needs!

The Kinnear Registered Life Extension service policy gives additional assurance of dependable and continuous Door or Grille operation. Complete records of every Kinnear installation are kept in fireproof vaults. In case of accidental damage, your nearby Kinnear Service Depot has, or can readily obtain, current parts for your Door or Grille for fast replacement. This points up one of Kinnear's true advantages — only the damaged slats, rods or links need be replaced rather than the complete unit.
Fortress walls of Jacksonville Children's Museum enclosed "please touch" exhibits. Photo: Judith Gefter.

FEATURES

64 Museum Play-In

The Jacksonville Children's Museum, a gleaming, geometric, fortresslike structure, constructed almost entirely of cast-in-place concrete, is designed as a module for easy expansion, and provides space for teaching, seeing, touching. William Morgan, Architect.

70 Ski Lodge Schools

Two schools designed both for innovative educational programs and Lake Tahoe's snowy winters are revisited after several years of operation. Van Bourg-Nakamura, Architects.

INTERIOR DESIGN DATA

74 Designing for the Real Customer

Three children's stores adopt a new approach to the young shopper and provide a pleasurable, educational and aesthetic environment to encourage shopping involvement. The Children's Place, Hartford, Conn.; Childcraft Center, N.Y.C.; Creative Playthings, N.Y.C.

80 Playing to Learn

In a break from the drudgery of traditional physical therapy, an unusual playground in Florida entices motor-impaired children into valuable play activities to teach them the basics necessary for further learning. The Magruder Environmental Therapy Complex, Orlando Fla. Leland G. Shaw, Architect.
MATERIALS AND METHODS

84 Designing for Security

A variety of security systems and how they can be intelligently designed into a building during its planning stage is the concern of this article by Richard B. Cole, president of Loss Prevention Diagnostics, Inc.

90 Living with Corbu

A new analysis of Le Corbusier's much-analyzed 25-year-old Marseilles apartment house, by H. Seymour Howard, Jr., Architect, is the kind of architectural criticism that offers the professional practical information.

98 Urban Renewal with Paint

One last word on the subject of Supergraphics—the potential of paint for quick, economical and community-involved urban renewal. Right now paint imaginatively used is enlivening ghettos, industrial areas and drab cities.

108 Selected Details

Weathersealing installation flange

Welded insulating glass

Rigid vinyl sheath over core of wood
Read about this window before you design your next building.

It could save your clients a pile of money and a whole lot of grief.

This is the Andersen Perma-Shield® Casement—a remarkable new kind of window.

- The core is made of warm natural wood.
- But the exterior is encased in a sheath of rigid vinyl. (Just like a coat of armor.) So it doesn't need painting. Nor scraping and puttying. Won't warp. Can't rust or corrode. Doesn't need storm windows either, if you specify welded insulating glass.

Just imagine ... the money it can save!

Think of maintenance costs, for example. With ordinary windows, it costs up to $10 per window to have the exteriors painted.

With Perma-Shield Casements, it doesn't cost a cent to have them painted. Their weatherproof vinyl sheath just doesn't need it ... stays new-looking indefinitely.

Consider fuel costs, too. Since this window has a core of wood (nature's best insulator), and it's built to such close tolerances, it's up to 4 times more weather-tight than an ordinary window. So it can save up to 15% on heating costs. (Quite a tidy sum.)

But, Perma-Shield saves more than money.

- It saves a lot of trouble, too.
- You won't have people complaining that these windows are cold and drafty. Their unique combination of wood, vinyl, welded insulating glass, and weather stripping makes Perma-Shield wonderfully snug and weathertight.

Yet, they're easy to operate ... smoothly. No sticking or binding. No changing shape with the weather. No rattling, leaking or balking.

Very simply, they don't bug people. So people won't bug you.

Actually, we could go on forever telling you about Perma-Shield windows—how they come in 4 styles and hundreds of sizes.

But we're running out of space.

So, why not get the rest of the story from your Sweet's Catalog, or your nearest Andersen distributor or dealer. Or send for our free booklet.

And read on.
More Modest Design Awards

Dear Editor: Notification of this year's P/A Design Awards program prompted our review of 1969's five awards and thirteen citations. Only one premiated submittal was less than a major, multimillion dollar project.

If the program's purpose is "to encourage the designers and owners of the projects so honored . . . " then we submit that it's the modest projects that need encouragement and recognition.

Besides, our submittal this year is a small job.

William Corlett, FAIA
San Francisco

(If you might think this is a personal form of communication, please consult the issue Jan. 1971. The majority of the winners were small jobs. Ed.)

Index for P/A

Dear Editor: I have a few years of Progressive Architecture magazines in my bookcase. Locating a particular project or an article was often a time consuming task until I "catalyzed" the projects by cutting out the monthly tables of contents and filing them in a folder. Now it is fast and easy to find what I want.

I want to thank you for the work you put into publishing such an interesting magazine.

Girish Ghatalia
Toronto, Ontario

(E.S.P. at work. We plan to publish a bi-annual index within the next month or two, which should relieve you of the troublesome task of clipping out the contents page. Ed.)

Premiated Defined

Dear Editor: Thank you very much for advising us that our project did not get premiated.

Apparently, we understand that our project did not win any awards, but the meaning of the word "premiated" has aroused a debate in our office. Would you be so kind as to advise us of the meaning of the word, since we have looked in our office dictionary and cannot find such a word.

William N. Bodenwe, AIA
New York, N.Y.

("Not premiated" is an archaic phrase meaning you lost, otherwise we send a telegram. Seriously, the derivation is from premium, also premia: a reward or recompense for a particular act. Please forgive our use of language. What we really meant to say was that we very much appreciate your entering the competition and regret that you did not receive a telegram. Judging is done by five outside experts who, after premiating, leave us with the task of returning the projects. Ed.)

Engineering Mentality

Dear Editor: Once again your "engineering mentality" is showing. You talk so proudly of your recognition of human needs and the need for closer interdisciplinary actions to help this poor Mother Earth that we inhabit. Then you actually recognize and honor an aluminum and glass breadbox located on a "rolling, wooded 210 acres located 20 miles northwest of Washington, D.C."

I am of course, referring to the Comsat Laboratories (P/A, August 1970, p. 70). Stated is the fact that the landscape retains the look of the local countryside. Possible that remains to be seen, but what type of countryside is left with that metal gleaming giant perched on the land like a vulture waiting to pick the bones of the remainder of the 210 acres and the surrounding lands.

Please, in the future, remember that this is the only place humans have to live and it is rapidly disappearing, thanks to the accepted thinking of our leaders today.

Roy H. Pender
Nashville, Tenn.

Yale Unfair?

Dear Editor: It is now almost a year since the results of your Annual Design Awards were published (P/A, Jan. 1970). At that time I wrote you, expressing my righteous indignation at the choice of some of the winning entries.

My concern was with the ugliness and incompetence in planning and design, and in the nihilistic trend that the jury was evincing a predilection for.

Since my serious concern then was, among others, with the relation of a juror and a couple of winners of the 1969 contest, I am even more seriously concerned now with the same three individuals, who in somewhat different roles have shown an ethically questionable interrelation in the case of the Yale Mathematics Building Competition.

I have most carefully examined all the program conditions of said contest and observed in the winning design at least 38 malfunctioning items or deviations from the program, some of which are so fundamental, that it would be well nigh impossible to proceed with construction of the building without major changes.

I feel very strongly that the professional media should have something to say about it, because the welfare of the entire architectural milieu is at stake.

Joshua D. Lowenshaj, AIA
Bronxville, N.Y.

Giving Credit

The correct credit for the Marshall Field Project (P/A Sept. 70, p. 46) is: Loebl Schlossman Bennett & Dart and C.F. Murphy Associates, Architects.

Ben Schnall was the photographer for the Caudill, Rowlett, Scott office building (P/A, Sept. 1970, p. 104).
Imagine an exterior wall cladding with all the beauty and durability of stone. Plus the low cost, easy installation and maintenance freedom of plywood. And you're into Sanspray? A natural stone aggregate bonded to plywood. The most exciting thing to happen to exteriors in a long, long time.

That's Sanspray's large aggregate pictured above. There's also a small aggregate (equally distinctive). And a range of colors you have to see to appreciate; like Tangerine, Pearl Gray, Gaelic Green, Monterey Sand... and others.

But the hidden beauty of Sanspray lies in its low cost—far less than most stone and masonry wall claddings. Far lighter, too, and much easier to install. Saw it. Drill it. Glue it. Nail it directly to framing members. Then forget it. Because Sanspray is virtually maintenance-free.

In all climates. Sanspray. The beauty treatment for all residential, light commercial and industrial buildings. Find out more about it at your local U.S. Plywood Branch Office.

U.S. Plywood
A Division of U.S. Plywood-Champion Papers Inc.
777 Third Avenue, New York, N.Y. 10017
the beautiful world of reinforced concrete rises unbelievably fast... 14 floors high in 8 days!

St. Petersburg's new Hilton Hotel is a record breaking example of quick construction speed using reinforced concrete. Its 8" thick walls were slip formed 136' high in 8 days and 3 hours, plumb within a 1" tolerance. R. D. Monroe Construction Co., Kansas City, Kansas, used more than 200 synchronized electric-hydraulic jacks to raise the 12,000 sq. ft. work platform an average of over 8 in. per hour! Innovative systems-building techniques enabled the builder to claim a new construction record for the St. Petersburg Hilton as the largest slip formed building to date. Plywood forms, hung from the work platform, were fitted with styrofoam blockouts for door, window, and air conditioner openings. Floors are cast working from the top down. Floor forms are hung on cables from temporary steel beams. Sleeves permit forms to be lowered successively as each floor is cast. Savings in construction time, formwork and scaffolding were combined with savings in material through use of Grade 60 reinforcing bars.

Construction speed like this results from the immediate availability and versatility that only reinforced concrete offers. It's ready to go when you are. No fabrication delays. No waiting for materials. And no limit to design possibilities. You'll find no other structural framing system has more to offer.
IT ADDS NOTHING.
And that can mean everything.

One of the requirements of good building design is that it be left alone. Inside and out. Flexalum Venette® 1-inch louvers do just that. They're functional without being obvious. Open, they virtually disappear. Closed, they give you complete privacy. In between, they control light with unprecedented subtlety and comfortable diffusion.

And the Venette is strong. Its spring tempered louvers are made of a special aluminum alloy for extra strength and resiliency. A rigid torque-tube head, aluminum wand tilter and polyester cable ladders help make this blind last longer—look newer longer.

The Venette—truly a classic in its own time—everything you'll ever want in a blind. Now. For more information write, Alcan Aluminum Corporation, Building Products Division, 100 Erieview Plaza, Cleveland, Ohio 44114

Cataloged in Sweets, Spec-Data and IDAC.
It's a new ceramic tile.
It's the natural thing to use.

Here you have Tuscany,™ American Olean's new ceramic tile with an interesting Old World look. Only a natural material can look so natural.

Note the interesting variations in surface and coloring. And think of where it can lend excitement to your designs.

As an accent surface. As a total area. It is suitable in big doses—and small places. Naturally.

Tuscany for walls everywhere. In Tuscany Pearl, Tuscany Gold, Tuscany Blue, and Tuscany Moss. 4-1/4" squares. Design service, yours without charge.

Write American Olean, 1414 Cannon Avenue, Lansdale, Pa. 19446.

On Reader Service Card, Circle No. 322
FABRO 5
VINYL FABRIC BACKED
WALL COVERINGS

GEO 49: One of several subtle geometries for smart, sophistication in those "special" areas.
From mod to classic and traditional, the new FABRO 5 book is an imaginative collection of excitement in color and design.

New patterns and colorways as far out—and as up-to-date as a space probe. Old favorites designed with a 1970 flair. They’re all in FABRO 5—the contract specifier’s most complete collection.

Here are just a few examples to spark your imagination.

**ALHAMBRA:** Point and counter-point as Moorish and Mediterranean designs seductively display their enticing beauty.

**TRAVERTINE:** Soft, quiet—a blend of shadows and muted colors for backgrounds anywhere.

**OBIDOS:** Textured luxury as color plays upon color to give you wide flexibility in room design.

**AKITA GRASS:** Ubiquitous grass with a different look—and in unusual colorways.

**GEO 5 FOIL:** Design for it—or with it. But be careful. It starts conversations with its unique impact.

Stimulated! Motivated! Write for more information on FABRO 5—the complete contract specifier’s collection. FABRO 5 from Fabrovin.

FABROVIN maintains a hand screen printing facility for use by designers, architects and other contract users.

FABROVIN offers design consultation for the development and reproduction of patterns in as many colors as required. Designs such as logos, scenics and special effects are easily coordinated with all of our patterns, to allow a one source manufacturer for both needs.
Miami builds for
Miami officials never know when a “Camille” or “Doris” or “Ethel” may come roaring into town. So they plan for hurricanes with one of the world’s most rigid building codes. Materials for industrial and commercial construction must pass tests twice as tough as those demanded in other parts of the country. Permalite Sealskin rigid roof insulation has approval of Metropolitan Dade County, Florida, Building and Zoning Dept. Even more important, Permalite is also nationally approved for FM Engineering Division Insulated Steel Deck Class 1 construction (fire and wind uplift); Underwriters Laboratories Inc. Metal Deck Assemblies Constructions Nos. 1 and 2 and others. GREFCO, Inc., Chicago, Los Angeles. A subsidiary of General Refractories Company.
The newest in year-round classroom air conditioning

The Chromalox® Electric Modulaire Air Conditioner gives you all-season comfort with eye-pleasing design and flexibility of usage.

Vertical and horizontal models permit installation in any building structure. And you eliminate bulky ductwork, chimneys and boiler rooms from your building costs. Temperature in each classroom can be individually controlled at all times. Models are available with or without mechanical cooling.

Seven baked enamel decorator colors with contrasting accent panels blend with any interior. Matching storage cabinets and shelf units permit the use of otherwise unproductive wall space.

Get complete details from your Chromalox representative. Or write direct for our new 24-page bulletin F03105.

CHROMALOX COMFORT CONDITIONING DIVISION
EMERSON ELECTRIC CO
8348 FLORISSANT AVENUE, ST. LOUIS, MISSOURI 63136

On Reader Service Card. Circle No. 392
Columbia, Md.

A city impatient to be born—and, against the tightest contract deadlines, Solo Spray delivers.

Columbia, Maryland—a complete new city—rises from the ground up. And at Partridge Courts SOLO SPRAY is the chosen way to get the painting done. Because the contractors wouldn't sacrifice quality, and couldn't spare time. They chose SOLO SPRAY because a single pass covers—match mil thickness to job requirements. Equals 3 to 4 coats of ordinary paints. And it practically stops time. Example: a 3,500-square-foot apartment completely finished in 14 minutes. By one man! Write now for the complete story: SOLO SPRAY—in Columbia.

GLIDDEN COATINGS & RESINS
ARCHITECTURAL & MAINTENANCE
CLEVELAND, OHIO 44115

On Reader Service Card, Circle No. 348
A special report from the American Gas Association.

What's being done about gas supply.
Recent reports of natural gas shortages in various parts of the country have apparently led to speculation that we are running out of natural gas. Now this is simply not true.

What's happening is this: In certain areas, the demand for additional natural gas has outrun the present ability to supply. Consequently, a number of utilities which have received requests for new large industrial loads have had to turn them down. These shortages are due partly to increased demands for natural gas — such as in the effort to fight air pollution — and partly to the fact that gas is now being consumed faster than new reserves are being developed.

This does not mean the country is running out of gas. (In fact, geologists estimate that proved and potential supplies are over 70 times our present annual consumption rate.)

It does mean both the industry and the regulatory authorities must work together to stimulate exploration, to reverse the present imbalance between supply and demand.

It means regulatory authorities must ensure a realistic approach to field prices that will provide the necessary incentive to an expanded exploratory effort in the continental United States — onshore and offshore. It means a huge investment by producers and pipeline companies to bring gas to market from fields as far away as Alaska.

And it means the gas distribution industry must work to accelerate these exploration efforts, and search for other ways to supplement our present gas supply, as well as use it more efficiently. Described on the following pages are six of the ways we are trying to do just that.
1. The gas is there. The problem is getting it.

Right now the estimated proved reserves in this country come to 275 trillion cubic feet. Potential supplies should add another 260 trillion cubic feet, for a total of 535 trillion cubic feet. These reserves alone are over 25 times the present consumption rate of 21 trillion cubic feet per year. Furthermore, comprehensive geophysical estimates indicate an additional domestic potential of 967 trillion cubic feet.

Nevertheless, the rate of consumption has been rising sharply. Also, gas is harder and more expensive to reach than it was years ago.

For example, offshore, where average discoveries have been much more substantial than onshore in recent years, drilling has been hampered by high costs, the need to drill deeper and deeper, and delays in the sales of new leases by the federal government. This only underscores the fact that the gas supply problem is one of incentive and technology rather than resources.
While expanding the search for new and greater domestic gas reserves, the gas industry also needs to make every effort to tap the potential elsewhere. Projects now in the planning stage envision a $1 billion pipeline to tap the gas reserves in Canada's Northwest Territories. Already under way is a $400 million pipeline to bring in gas from recent discoveries in Alberta.

While huge investments are needed, such new pipelines could provide our customers with 1.5 billion cubic feet of gas per day from Canada within a few years. By constructing an even costlier pipeline system from Alaska, we can deliver several hundred trillion cubic feet of gas where it's needed. Finally, there is now an active exploration program off Nova Scotia where exploratory permits have been granted for more than 260 million acres. During the next few years, $100 million will be spent in this program.
3. The promise of packaged gas.

Just as pipeline technology ended dependence on local gas, LNG, liquefied natural gas, makes this form of energy an international commodity. Because LNG is only 1/600th the volume of natural gas, it can be transported easily across the oceans in cryogenic supertankers.

This means we shall be able to draw upon reserves in South America, Africa and other parts of the world. The reserves in Algeria alone range from one-fourth to one-third those of the United States. While international contracts for importing LNG involve high risk and cost factors, a number of long-term agreements have been signed to bring significant volumes of gas to East Coast ports.

This supplemental supply from overseas can be stored conveniently, so that LNG is being used more and more often for "peak shaving."
What makes natural gas desirable is not the fact that it is "natural," but its particular chemistry. As part of its long-range research program, the gas industry has been looking into the possibility of producing a pipeline-quality gas, methane, from coal or oil. Although synthetic, the methane would be fully interchangeable with natural gas.

This "unnatural" gas, made from coal, is already being produced by a pilot plant financed jointly by the American Gas Association and the federal government. With a major investment for research at this and larger-scale facilities, we shall have a practical, economically viable conversion process — using any type of coal.

Once this is done, it will open up a major new source of supply for natural gas users. Because coal is abundant and widely scattered geographically, the importance of our research effort in meeting future needs is inestimable.
5. New technology to boost gas supply.

Much of the natural gas reservoir in this country has been unavailable because we couldn’t get at it without deep drilling. In West Virginia, for example, only 15% of its roughly 100,000 cubic miles of sediments has been tested. Now two ultra-deep wells are being drilled in the Appalachian basin. These and other deep wells—over four miles deep in the Southwest—will increase the supply of gas for delivery by major pipelines.

Offshore drilling has also benefited from new technology. Less than ten years ago, drilling in the Gulf of Mexico was limited to water depths of 300 feet or less. In the past four years, depths of 600 feet have been explored. And today, drilling in water depths up to 1500 feet seems entirely feasible.

In another research development, nuclear detonation deep underground has been designed to fracture rock which holds large supplies of natural gas. The Atomic Energy Commission and the Gas Industry are cooperating in these experiments.
Getting more energy out of gas.

Despite all these efforts to increase the supply of natural gas, it is sound economy as well as conservation not to waste it.

In some industrial direct-heating applications, for example, modern gas-fired infrared equipment has demonstrated dramatic savings in gas. Recycling exhaust systems, improved insulation, submerged combustion, continuous-fire kilns, modular boilers, industrial preheating, and oxygen-enriched gas-fired systems are other methods of conserving natural gas.

Overall, new technology which makes more efficient use of energy must offset the increasing demand for clean-burning natural gas.

This makes sense in purely dollar terms as well. The cost of all forms of energy is increasing. The cost of supplementing our gas supply — of getting at the gas and making it available — is increasing, too. As a result, the final cost of natural gas to the user will obviously depend not only on price but on how efficiently it is used.

AMERICAN GAS ASSOCIATION, INC.
Levolor Rivieras give the Westinghouse headquarters building a new outlook.

They're the new Riviera design by Levolor. The Alcoa® aluminum slats are much narrower than conventional blinds. And you can control the daylight and view to a degree never possible before, simply by rotating the "Magic Wand." This fingertip control is demonstrated (above) in an executive office in the new Pittsburgh headquarters of the Westinghouse Electric Corporation.

Levolor blinds also reduce cooling costs in this exciting building.* That's one reason they're being specified in more and more prestigious office buildings. Four other good reasons: sleek contemporary styling, durable aluminum, easy-to-clean slats, a choice of 39 decorator colors.

Specify Levolor Rivieras on your next project. For complete information, write to: Levolor Lorentzen, Inc., 720 Monroe Street, Hoboken, N. J. 07030.

*Owned and operated by: The Equitable Life Assurance Society of the United States; Architect: Harrison & Abramovitz; Contractor: George A. Fuller Co., Inc.

Change for the better with Alcoa Aluminum
Economic Forecast

The Year of Reckoning

No architect will need to be told much about the current economic picture. This is the year when President Nixon's 1969 economic "game plan" to cut inflation was undoubtedly felt by all sectors of the economy, including architectural firms. The plan called for Federal spending curbs, tight budgets and a stringent monetary policy. Although construction industry was severely affected a year ago, architecturally designed construction still in the project phase had not shown the bite yet. Even now, respondents to P/A's 1971 survey report a 5.8% lead as of September 1 on their total dollar volume for 1969, with total anticipated 61% higher dollar volume by year end than last year. Nevertheless, figures indicate that firms — usually in small and medium sized range — showing a decrease in dollar volume are in the majority. Yet large as well as small offices have been hit by the unique compound effect of Nixon's game plan that for six months caused corporate profits to go down, employment and inflation to go up. In an interview reported in the New York Times, Richard Roth Jr. of Emery Roth & Sons (reputed to have done $1.5 billion volume last year) stated about the current volume of work: "It's a disaster, to be perfectly honest." But the problems felt by large offices are more serious for small firms. As Charles Moore stated, the difficulty is "that people don't pay their bills," so that the little office has outstanding bills, with consultants demanding their payments in turn.

P/A's Survey for 1971

In compiling its annual business survey, the only one in the country that forecasts architecturally designed construction for the coming year, P/A sent a questionnaire to 5000 readers. By the deadline responses from 1002 firms had been received, a broader base than last year's response (618). The largest percentages of response — in ranges of 17.7% to 19.6% — were from the Middle Atlantic, East North Central,
South Atlantic and Pacific regions. The smallest percentages (ranging from 3.9% to 6.3%) were from New England, West North Central, East South Central and the Mountain regions. The majority (55.8%) of the offices responding seems to comprise one to four persons, who control 19.7% of the total dollar volume of business. The large firms (25 plus) represent only 4.8% of firms reporting, but control 27% of the business.

Dollar Volume Trends

The inflationary cutback measures have had an effect nationwide on firms, but actually may not be as crucial as some might think (Table 1). While 45.2% of the respondents reported a decrease in business last year, close to a third (34.8%) reported an increase and about 22.5% stayed the same. Of those reporting a decrease, 64.3% had a decrease of less than 50% and 35.7% had a decrease of over 50%. Of the third reporting an increase, 57.4% increased their work less than 50%, while 42.6% increased their work over 50% (of this group 9% increased their dollar volume by 100%). This is less than last year's results when 57% of the firms reported an increase in dollar volume of work over the previous year, and of those firms, over half reported work increases of 50-100%.

Comparing small firms (less than five employees) to large firms, it was found that the majority of firms (60.7%) reporting a decrease of 50-100% in volume were small firms. Yet small firms (64.4%) were in the lead of the firms who reported an increase of 50-100%.

In asking architects their dollar volume for 1971 construction, P/A found that 55% of the firms have a dollar volume in the $1-$10 million range (a drop from last year when almost two-thirds of the firms fell in the $1-$11 million volume range); 14.3% of the firms have a total dollar volume in the $10-$25 million range and 7.1% top that (Table 2).

Geographical Distribution of Work

Over 82% of the firms in the East North Central and West South Central regions have more than $1 million volume. The Mountain, East South Central, and Middle Atlantic regions are close seconds having 79-80% of their firms in that range. The West North Central have 11.9% of the firms doing over $25 million of business, while New England has the greatest percentage (19.4%) of the firms in the under $500,000 range. Regarding proportionate increases and decreases in work over the last year, (Table 3) the Mountain region leads in increase in volume (50% of the firms have more work). The Middle Atlantic states come next with 41.2% of the firms reporting more work. The greatest percentage of firms showing a decrease in work are in New England (52.6% with only 29.8% of the firms showing an increase) and the East North Central region (49.2%). All regions except Mountain and Middle Atlantic have a higher percentage (36.7-52.6%) of firms showing a decrease in volume over last year than firms showing an increase.

Types of Buildings Presented

According to the P/A survey (Table 4) the greatest number of architectural firms responding (47.4%) are involved in commercial low-rise buildings, with residential private/single buildings next, followed by government sponsored educational buildings and private residential low-rise. These results are similar to last year's findings including the category with the least number of firms involved—defense and space. The building type expected to yield the highest total dollar volume for this year is educational construction for state and local governments, with a billing of $1,282,300,000. (One out of five firms is involved in this type.) Also near that billion dollar mark are commercial low-rise, commercial high-rise and residential low-rise (not including public housing) all in the $800 million range. City and town planning is not to be ignored: together community planning and design (non-governmental) and urban design and

Table 1

<table>
<thead>
<tr>
<th>Change from 1969</th>
<th>Firms Reporting Change</th>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS THAN 50%</td>
<td>57.4%</td>
<td>64.3%</td>
<td>50.4%</td>
</tr>
<tr>
<td>Fewer than 5 employees</td>
<td>47.7%</td>
<td>50.4%</td>
<td>49.6</td>
</tr>
<tr>
<td>5 or more employees</td>
<td>52.3</td>
<td>49.6</td>
<td>33.6%</td>
</tr>
<tr>
<td>50 to 100%</td>
<td>33.6%</td>
<td>32.8%</td>
<td>32.8%</td>
</tr>
<tr>
<td>Fewer than 5 employees</td>
<td>64.4%</td>
<td>60.7%</td>
<td>39.3</td>
</tr>
<tr>
<td>5 or more employees</td>
<td>35.6</td>
<td>39.3</td>
<td>35.6</td>
</tr>
<tr>
<td>Over 100%</td>
<td>9.0%</td>
<td>2.9%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Fewer than 5 employees</td>
<td>48.1%</td>
<td>63.6%</td>
<td>35.6</td>
</tr>
<tr>
<td>5 or more employees</td>
<td>51.9</td>
<td>36.4%</td>
<td>51.9</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Types of Buildings Presented</th>
<th>Total Amount of Work Being Done for 1971 Construction</th>
<th>U.S. Total</th>
<th>New England</th>
<th>Middle Atlantic</th>
<th>East North Central</th>
<th>West North Central</th>
<th>South Atlantic</th>
<th>East South Central</th>
<th>West South Central</th>
<th>Mountain</th>
<th>Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential low-rise</td>
<td>Under $500,000</td>
<td>11.7%</td>
<td>19.4%</td>
<td>9.2%</td>
<td>10.0%</td>
<td>5.1%</td>
<td>14.3%</td>
<td>10.3%</td>
<td>7.0%</td>
<td>5.1%</td>
<td>17.2%</td>
</tr>
<tr>
<td>$1,000,000-9,999,999</td>
<td>24.9%</td>
<td>55.0%</td>
<td>53.3%</td>
<td>54.2%</td>
<td>62.4%</td>
<td>47.3%</td>
<td>56.3%</td>
<td>61.3%</td>
<td>61.0%</td>
<td>59.0%</td>
<td>47.1%</td>
</tr>
<tr>
<td>$10,000,000-24,999,999</td>
<td>14.3%</td>
<td>61.0%</td>
<td>64.4%</td>
<td>61.0%</td>
<td>59.0%</td>
<td>47.1%</td>
<td>57.4%</td>
<td>57.4%</td>
<td>57.4%</td>
<td>57.4%</td>
<td>57.4%</td>
</tr>
<tr>
<td>Over $25,000,000</td>
<td>7.1%</td>
<td>64.4%</td>
<td>61.0%</td>
<td>61.0%</td>
<td>59.0%</td>
<td>47.1%</td>
<td>47.1%</td>
<td>47.1%</td>
<td>47.1%</td>
<td>47.1%</td>
<td>47.1%</td>
</tr>
</tbody>
</table>

*Amount insignificant: less than 0.1%.

Table 3

<table>
<thead>
<tr>
<th>Geographic Region</th>
<th>1970 Volume of Design Work</th>
<th>Compared to 1969 Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>29.8%</td>
<td>52.6%</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>41.2%</td>
<td>40.0%</td>
</tr>
<tr>
<td>East North Central</td>
<td>30.2%</td>
<td>49.2%</td>
</tr>
<tr>
<td>West North Central</td>
<td>30.2%</td>
<td>47.2%</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>36.1%</td>
<td>43.7%</td>
</tr>
<tr>
<td>East South Central</td>
<td>23.5%</td>
<td>44.1%</td>
</tr>
<tr>
<td>West South Central</td>
<td>32.2%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Mountain</td>
<td>50.0%</td>
<td>34.6%</td>
</tr>
<tr>
<td>Pacific</td>
<td>33.3%</td>
<td>43.0%</td>
</tr>
</tbody>
</table>

*Amount insignificant: less than 0.1%.

Table 4

<table>
<thead>
<tr>
<th>Geographic Region</th>
<th>1970 Volume of Design Work</th>
<th>Compared to 1969 Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>29.8%</td>
<td>52.6%</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>41.2%</td>
<td>40.0%</td>
</tr>
<tr>
<td>East North Central</td>
<td>30.2%</td>
<td>49.2%</td>
</tr>
<tr>
<td>West North Central</td>
<td>30.2%</td>
<td>47.2%</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>36.1%</td>
<td>43.7%</td>
</tr>
<tr>
<td>East South Central</td>
<td>23.5%</td>
<td>44.1%</td>
</tr>
<tr>
<td>West South Central</td>
<td>32.2%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Mountain</td>
<td>50.0%</td>
<td>34.6%</td>
</tr>
<tr>
<td>Pacific</td>
<td>33.3%</td>
<td>43.0%</td>
</tr>
</tbody>
</table>

*Amount insignificant: less than 0.1%.
redevelopment (including public housing) bring in a dollar volume of $1,168,500,000.

Who is Getting What?

Commercial high-rise structures are expected to yield almost $900 million this year yet only a relatively small proportion of the respondents (a little over 10%) were involved in this type.

As Table 5 shows, commercial low-rise architecture is being done by firms having a total business volume of $5–$19.9 million. State and local government offices and service building and residential low-rise are also the common types of buildings done by these firms. The great majority of Federal government office and service building (82%) is done by the real biggies—firms with an annual volume of $20 million and over. They also handle most of the Federal hospital/health buildings design work (73.1%) as well as over half of the other Federal construction. Residential high-rise building is yet another category dominated by the $20 million-and-over offices.

And Where

The Middle Atlantic states have a fairly equal share, 25–35%, of dollar volume in most building types, (Table 6) while the East North Central states have the largest share of volume (69.4%) in Federal Government hospital and health buildings. The South Atlantic region has the largest dollar volume in defense and space construction (68.2%). The West South Central states have garnered the largest volume in Federal office and service building construction (49.3%) while the Pacific region’s largest dollar volume is in residential private construction (38.0%).

Breaking it down another way, the numbers of firms in each region involved in various building types show similarities. About half or more (48.7–62.6%) in every geographic region of the U.S. are working on commercial low-rise building, and at least two out of five firms in every region and sometimes half the firms (in New England, Mountain and Pacific states) are involved in residential private single houses. In the East South Central states 56.4% of the firms are involved in education construction on the state and local government level.

1969 Designs Actually Built

A strong index of the amplitude of future commissions is reflected in figures showing how much of last

---

Table 4

<table>
<thead>
<tr>
<th>Type of Work</th>
<th>Total Firms</th>
<th>Volume of Work on Boards September 1</th>
<th>Additional Work Anticipated Before the End of This Year</th>
<th>Total in 1970</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial low-rise (1-3 stories)</td>
<td>475</td>
<td>$540,800,000</td>
<td>$287,400,000</td>
<td>$828,200,000</td>
</tr>
<tr>
<td>Commercial high-rise (4 stories, up)</td>
<td>111</td>
<td>614,800,000</td>
<td>261,500,000</td>
<td>876,300,000</td>
</tr>
<tr>
<td>Industrial</td>
<td>196</td>
<td>193,100,000</td>
<td>116,100,000</td>
<td>309,200,000</td>
</tr>
<tr>
<td>Community planning and design, non-government</td>
<td>79</td>
<td>273,600,000</td>
<td>210,100,000</td>
<td>483,700,000</td>
</tr>
<tr>
<td>Urban design and redevelopment, including public housing</td>
<td>121</td>
<td>406,400,000</td>
<td>278,400,000</td>
<td>684,800,000</td>
</tr>
<tr>
<td>Federal government</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>28</td>
<td>85,100,000</td>
<td>24,700,000</td>
<td>109,800,000</td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>23</td>
<td>75,400,000</td>
<td>66,800,000</td>
<td>142,200,000</td>
</tr>
<tr>
<td>Defense and space</td>
<td>13</td>
<td>39,700,000</td>
<td>5,300,000</td>
<td>45,000,000</td>
</tr>
<tr>
<td>Other (not including housing)</td>
<td>20</td>
<td>36,100,000</td>
<td>6,900,000</td>
<td>43,000,000</td>
</tr>
<tr>
<td>State and local government</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>88</td>
<td>150,600,000</td>
<td>84,300,000</td>
<td>234,900,000</td>
</tr>
<tr>
<td>Educational</td>
<td>259</td>
<td>913,200,000</td>
<td>369,100,000</td>
<td>1,282,300,000</td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>59</td>
<td>237,700,000</td>
<td>135,400,000</td>
<td>373,100,000</td>
</tr>
<tr>
<td>Other (not including housing)</td>
<td>73</td>
<td>247,600,000</td>
<td>57,900,000</td>
<td>305,500,000</td>
</tr>
<tr>
<td>Educational, private (not including government)</td>
<td>109</td>
<td>187,700,000</td>
<td>95,000,000</td>
<td>282,700,000</td>
</tr>
<tr>
<td>Hospitals/health, private (not including government)</td>
<td>143</td>
<td>468,500,000</td>
<td>230,000,000</td>
<td>698,500,000</td>
</tr>
<tr>
<td>Residential, private, single</td>
<td>373</td>
<td>73,080,000</td>
<td>49,250,000</td>
<td>122,330,000</td>
</tr>
<tr>
<td>Residential, low-rise (3-3 stories)</td>
<td>222</td>
<td>504,900,000</td>
<td>353,100,000</td>
<td>859,000,000</td>
</tr>
<tr>
<td>not including public housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential, high-rise (4 stories, up)</td>
<td>78</td>
<td>408,500,000</td>
<td>225,500,000</td>
<td>638,000,000</td>
</tr>
<tr>
<td>not including public housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>226</td>
<td>241,700,000</td>
<td>114,400,000</td>
<td>356,100,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,002</td>
<td>$5,698,480,000</td>
<td>$2,976,150,000</td>
<td>$8,674,630,000</td>
</tr>
</tbody>
</table>

Table 5

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>Under $1-Million</th>
<th>$1-Million to $4.9-Million</th>
<th>$5-Million to $19.9-Million</th>
<th>$20-Million and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial low-rise</td>
<td>7.7%</td>
<td>31.0%</td>
<td>48.2%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Commercial high-rise</td>
<td>1.6</td>
<td>12.3</td>
<td>32.6</td>
<td>53.5</td>
</tr>
<tr>
<td>Industrial</td>
<td>8.2</td>
<td>28.7</td>
<td>35.7</td>
<td>27.4</td>
</tr>
<tr>
<td>Community planning/design</td>
<td>1.9</td>
<td>29.3</td>
<td>38.7</td>
<td>48.9</td>
</tr>
<tr>
<td>Urban design/redevelopment</td>
<td>4.0</td>
<td>7.5</td>
<td>38.7</td>
<td>57.2</td>
</tr>
<tr>
<td>Federal government</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>0.1</td>
<td>3.9</td>
<td>13.7</td>
<td>82.3</td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>6.1</td>
<td>9.8</td>
<td>11.0</td>
<td>73.1</td>
</tr>
<tr>
<td>Defense and space</td>
<td>3.0</td>
<td>11.8</td>
<td>29.8</td>
<td>55.4</td>
</tr>
<tr>
<td>Other</td>
<td>3.5</td>
<td>28.5</td>
<td>10.8</td>
<td>57.2</td>
</tr>
<tr>
<td>State and local government</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>5.4</td>
<td>13.5</td>
<td>44.3</td>
<td>36.8</td>
</tr>
<tr>
<td>Educational</td>
<td>3.3</td>
<td>16.5</td>
<td>39.1</td>
<td>41.1</td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>6.3</td>
<td>27.6</td>
<td>46.0</td>
<td>20.1</td>
</tr>
<tr>
<td>Other</td>
<td>21.1</td>
<td>38.0</td>
<td>31.7</td>
<td>9.2</td>
</tr>
<tr>
<td>Educational, private</td>
<td>7.0</td>
<td>25.3</td>
<td>34.7</td>
<td>33.0</td>
</tr>
<tr>
<td>Hospitals/health, private</td>
<td>3.9</td>
<td>19.1</td>
<td>29.5</td>
<td>47.5</td>
</tr>
<tr>
<td>Residential, private, single</td>
<td>17.3</td>
<td>33.7</td>
<td>29.6</td>
<td>19.4</td>
</tr>
<tr>
<td>Residential, low-rise</td>
<td>2.6</td>
<td>21.8</td>
<td>46.1</td>
<td>29.5</td>
</tr>
<tr>
<td>Residential, high-rise</td>
<td>3.3</td>
<td>12.0</td>
<td>17.8</td>
<td>66.9</td>
</tr>
<tr>
<td>Other</td>
<td>7.4</td>
<td>33.2</td>
<td>20.5</td>
<td>38.9</td>
</tr>
<tr>
<td>Proportion of Total Business</td>
<td>4.9%</td>
<td>20.2%</td>
<td>34.6%</td>
<td>40.3%</td>
</tr>
</tbody>
</table>
From its unique structural system to its outside walls, the 38-story Ala Moana Hotel in Honolulu is an assembly of precast concrete components. The building’s structural system is an arrangement of precast concrete H-frames stacked and grouted one atop the other to support prestressed concrete planks of the floor system. The H-frames are joined midway between stories using a unique method developed by Alfred A. Yee, structural engineer for the project. Formed sockets were cast into the upper sections of each H-frame and reinforcing dowels were cast into the lower sections. On erection, the sockets were filled with a special Master Builders flowable EMBECO non-shrink grout to provide high strength bond to the dowels of the H-frame member seated on it ... thus forming continuous columns with structural integrity.

POZZOLITH admixture was used in all the precast concrete. It improved placeability and workability, promoted optimum density, and improved uniformity from batch to batch. Especially significant, POZZOLITH helped obtain high early and high ultimate strengths.

Concrete with POZZOLITH admixture has performed impressively in many other structures in the huge Ala Moana complex. POZZOLITH delivers superior performance where performance counts — on the job. That’s why, over the years, POZZOLITH has earned the name “The Performance Admixture.”

There are over 200 Master Builders field men throughout the country. Call the one nearest you for detailed information on POZZOLITH and EMBECO. Master Builders, Cleveland, Ohio 44118.

**Precast concrete, EMBECO grout, and POZZOLITH admixture expedite construction of Ala Moana Hotel**

**Owner:** Kona Corporation. **Architect:** John Graham & Company. **Structural Engineer:** Alfred A. Yee & Associates. **General Contractor:** Hawaiian Dredging & Construction Company, Division of Dillingham Corporation. **Precast and prestressed concrete:** Dillingham Precast.
Nova
Designed by Gerde Lange

Winner of the 1969 Bundesspiele Gute Form and selected for use throughout the 1972 Olympics. Constructed of a molded polypropylene shell and %" dia. chrome plated steel frame, Nova has successfully withstood tests in excess of 250,000 sittings, loaded to 220 lbs. Its unique shell design affords greater body support and resistance to lateral flexure.

Available now: with or without upholstery... for ganging, stacking, tandem or stadium seating. Accessories soon available: book rack, writing tablet arm, chair dolly.

The following are available at no charge when requested on your professional letterhead: an illustrated brochure and price sheet of the Nova chair; an illustrated price list of the complete A.I. collection. Also available: a complete furniture and lighting catalogue, $5, fabric collection swatch box $20.

Atelier International, Ltd., 139 East 57th Street
New York, N.Y. 10022.
NEWS REPORT

Table 6

<table>
<thead>
<tr>
<th>Type of Construction</th>
<th>New England</th>
<th>Middle Atlantic</th>
<th>North Central</th>
<th>Western</th>
<th>South Atlantic</th>
<th>South Central</th>
<th>West Central</th>
<th>Mountain</th>
<th>Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial low-rise (1-3 stories)</td>
<td>4.2%</td>
<td>24.1%</td>
<td>11.8%</td>
<td>5.3%</td>
<td>16.5%</td>
<td>2.0%</td>
<td>10.6%</td>
<td>4.7%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Commercial high-rise</td>
<td>1.8%</td>
<td>29.7%</td>
<td>9.6%</td>
<td>4.1%</td>
<td>16.5%</td>
<td>1.2%</td>
<td>10.5%</td>
<td>6.3%</td>
<td>20.3%</td>
</tr>
<tr>
<td>Industrial</td>
<td>10.6%</td>
<td>30.2%</td>
<td>20.6%</td>
<td>5.7%</td>
<td>13.1%</td>
<td>5.0%</td>
<td>2.6%</td>
<td>2.0%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Community planning/design</td>
<td>1.9%</td>
<td>17.9%</td>
<td>3.3%</td>
<td>18.2%</td>
<td>13.3%</td>
<td>0.6%</td>
<td>16.2%</td>
<td>1.8%</td>
<td>26.8%</td>
</tr>
<tr>
<td>Urban design/redevelopment</td>
<td>4.5%</td>
<td>34.0%</td>
<td>6.8%</td>
<td>6.3%</td>
<td>9.7%</td>
<td>6.1%</td>
<td>17.0%</td>
<td>1.8%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Federal government</td>
<td>*</td>
<td>9.5%</td>
<td>9.7%</td>
<td>1.2%</td>
<td>20.6%</td>
<td>0.4%</td>
<td>49.3%</td>
<td>0.5%</td>
<td>8.8%</td>
</tr>
<tr>
<td>Office and service</td>
<td>9.8%</td>
<td>1.2%</td>
<td>69.4%</td>
<td>3.9%</td>
<td>4.9%</td>
<td>2.4%</td>
<td>4.6%</td>
<td>*</td>
<td>3.8%</td>
</tr>
<tr>
<td>Defense and space</td>
<td>*</td>
<td>*</td>
<td>0.2%</td>
<td>13.8%</td>
<td>68.4%</td>
<td>6.0%</td>
<td>0.4%</td>
<td>2.7%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Other</td>
<td>9.1%</td>
<td>24.9%</td>
<td>4.2%</td>
<td>35.1%</td>
<td>13.7%</td>
<td>2.8%</td>
<td>1.4%</td>
<td>*</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

State and local government     | 0.5%        | 26.3%           | 13.7%         | 15.3%   | 21.0%          | 1.1%          | 6.0%         | 5.5%     | 10.6%   |
| Office and service             | 9.3%        | 30.8%           | 15.1%         | 8.1%    | 13.4%          | 3.5%          | 6.2%         | 5.0%     | 8.6%    |
| Educational                    | 2.0%        | 34.2%           | 18.6%         | 22.9%   | 6.8%           | 1.9%          | 6.4%         | 1.5%     | 5.7%    |
| Hospitals/health               | 0.9%        | 30.7%           | 8.5%          | 25.2%   | 8.8%           | 1.1%          | 5.3%         | 1.1%     | 18.4%   |
| Other                          | 3.9%        | 33.1%           | 7.3%          | 21.1%   | 16.2%          | 2.1%          | 7.4%         | 3.2%     | 5.7%    |
| Residential, private, single   | 2.4%        | 25.3%           | 16.6%         | 13.4%   | 6.0%           | 1.8%          | 6.8%         | 4.5%     | 23.2%   |
| Residential, low-rise           | 5.8%        | 16.2%           | 6.7%          | 2.7%    | 15.5%          | 1.2%          | 6.8%         | 7.1%     | 38.0%   |
| Residential, high-rise         | 4.1%        | 17.6%           | 10.8%         | 1.9%    | 16.1%          | 1.7%          | 12.7%        | 5.1%     | 20.0%   |
| Other                          | 3.6%        | 33.8%           | 5.9%          | 2.4%    | 25.3%          | 0.7%          | 3.3%         | 4.4%     | 20.6%   |

| *Amount insignificant; less than 0.1% |

Table 7
Total Construction from Work Designed in 1969

<table>
<thead>
<tr>
<th>Type of Construction</th>
<th>Total Volume of Work Designed in 1969</th>
<th>Amount Constructed in 1970</th>
<th>$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial low-rise (1-3 stories)</td>
<td>$529,200,000</td>
<td>$380,900,000</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Commercial high-rise (4 stories, up)</td>
<td>625,100,000</td>
<td>337,800,000</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td>307,900,000</td>
<td>242,100,000</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Community planning/design, non-government</td>
<td>208,900,000</td>
<td>58,300,000</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Urban design and redevelopment, including public housing</td>
<td>361,700,000</td>
<td>240,500,000</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Federal government</td>
<td>59,700,000</td>
<td>11,100,000</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>121,100,000</td>
<td>24,600,000</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>54,100,000</td>
<td>4,500,000</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Defense and space</td>
<td>29,200,000</td>
<td>19,400,000</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>State and local government</td>
<td>179,600,000</td>
<td>107,900,000</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Office and service</td>
<td>873,600,000</td>
<td>576,500,000</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Educational</td>
<td>102,500,000</td>
<td>69,100,000</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Hospitals/health</td>
<td>65,400,000</td>
<td>33,500,000</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Educational, private (not including government)</td>
<td>176,200,000</td>
<td>144,100,000</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Hospitals/health, private (not including government)</td>
<td>280,900,000</td>
<td>169,500,000</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Residential, private, single</td>
<td>108,450,000</td>
<td>74,580,000</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Residential low-rise (1-3 stories) not including public housing</td>
<td>518,800,000</td>
<td>292,300,000</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Residential high-rise (4 stories, up) not including public housing</td>
<td>342,300,000</td>
<td>184,200,000</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>433,600,000</td>
<td>190,200,000</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$5,388,250,000</td>
<td>$3,161,080,000</td>
<td>59</td>
<td></td>
</tr>
</tbody>
</table>

year's work on the boards actually was constructed in 1970 (Table 7). Of all the work done by architectural firms in 1969, only 59% was constructed. The survey showed that the percentages were highest for educational, private with 82%; industrial 79%; and commercial low-rise 72%. Those categories with the lowest percentage of volume actually built were in the Federal Government programs for offices and service (16% of the volume was built); hospitals/health (20% of the volume built); and defense and space (only 8% constructed). State and local governments did much better than Federal, building over half of their projects.

Architects' Views

Because of economic fluctuations, architects are often not in the best frame of mind about the profession. As one respondent described his present attitudes toward the practice of architecture, they are characterized by "depression and panic, tempered by brief periods of hysteria." Another, speaking more generally about architecture as a profession said, "Architecture, diminishing as a profession, is becoming more of a job." Others feel this frustration by being in a "middle man role" squeezed between "client and spiraling costs of construction, decreasing quality of construction, materials and building equipment." The result of some of these pressures is viewed more positively by some architects. The architect is now learning businesslike attitudes to use in his practice. As one architect expressed it, they are being forced to "loosen prejudices and learn how to make money in order to survive." Services, fees and production are all watched very closely. (As a result of the scarcity of commissions, some are reducing fees, but others insist the fee structure must go up.) There is more of a willingness for the architect to participate in jobs as entrepreneur and many firms are trying to offer the complete run of services in the package. Architectural-engineering mergers seem to be most common, partly because as one architect put it "consultants are too slow to produce work by date of delivery." But the combined efforts of developer, contractor and architect are gaining way. Turn-key operations in which the contractor employs architects and engineers are cited by a number of respondents as being more and more frequent. Also cited of course is the tendency for big firms to get larger and small firms to go by the wayside. Some optimists feel however that the good small architect
We make a lot of different ceilings to do a lot of different things. This one accommodates the future.

If the space requirements of this office change, the Armstrong C-60/30 Luminaire Ceiling System above it will handle them. First, interior partitions can be placed and replaced anywhere along Luminaire's grid. Second, if more or less light is needed in a particular area, or if design layout is the issue, flat panels can easily be substituted for lighting modules (and vice versa). In any arrangement, C-60/30 Luminaire offers a variety of air-handling systems, superior sound control, UL-rated fire protection, and sprinkler head adaptability.

Your Armstrong representative is in the best position to tell you more about Luminaire and all the other hard-working Armstrong Ceiling Systems. For his name and a copy of our Ceiling Systems folio, please write: Armstrong, 4211 Watson St., Lancaster, Pa. 17604.
will always be in demand.

But even these architects realize the need for making work procedures more efficient by use of computers in specification writing and production of architectural drawings. Some foresee not only computerized specifications, but also computerized structural design and feasibility services to be in wide practice in the near future.

Regarding broader concerns of architects, many respondents cited an increased involvement in community needs and environmental problems due to a mounting social awareness on the part of architects. As one stated, "There appears to be an increasing desire for greater responsibility in the realm of community planning accompanied by a decreasing interest in performance of the small details which form day-to-day practice." Hence the need for computerization.

**Outlook for the Coming Year**

Recently, economic forecasters have agreed that the worst is over. They generally predict an upturn in the economy, then a period of moderate growth. With the recent falling price rate, the loosening of money by the Federal Reserve Board, and the apparently precedent-setting reduction of prime interest rates by First Pennsylvania Banking & Trust from 8% to 7 1/2%, relief is in order. Unemployment, however, is up to 5.5% and is expected to rise before it goes down. Thus the speculation that the rate of price rise is likely to move higher again soon, (although not back to previous inflationary levels) and that money will tighten after elections. If money doesn't tighten, though, the improved situation will undoubtedly affect construction and, of course, architectural design.

Mortgages are unlikely to drop their 8 1/2% interest rate for some time, since demand for construction money is strong. Yet the drop in prime rate interest means that money is more plentiful, with the result that down payments on houses may lower. While housing starts have decreased 11% from 1969, they are predicted to jump 15% next year. And as far as commercial construction is concerned, it is expected to drop in New York in 1971 but pick up in cities such as Houston, Boise, Tucson and Tampa. Construction should soon be on the upswing. The effect on architecturally designed construction next year is hard to gage. Most likely firms will be slowly getting back on their feet but at a cost of many small practices.

**Realpolitik and Architecture**

The New York State Urban Development Corporation has recently been treating New Yorkers to a view of many of its urban development projects. With extraordinary timing evidently inspired by gubernatorial elections, two museums, the Whitney and the Metropolitan Museum of Art, opened exhibitions of projects commissioned by the public benefit corporation.

**“Cities” Show at Whitney**

Eighteen projects (including ten in New York City) were on display for three weeks presenting work of architects Paul Rudolph; Ulrich Franzen; Sert, Jackson & Associates; Davis, Brody; James Stewart Polshek; Gruzen & Partners, among others. The installation, designed by Robert A.M. Stern and John F. Haggman, included a full-size house in the museum's sculpture court. The 41' x 24' house composed of four modular units is a prototype dwelling unit for a system designed by Jerry Wells and Fred Koetter for General Shelters. It proved to be the hit of the show.

**Welfare Island in First Stage**

Meanwhile at the Met, a small exhibition illustrated interim design for UDC's Welfare Island. After Philip Johnson and John Burgee submitted a master plan last year (P/A Dec. 1969, p. 42) they were retained for the design of the Town Center, including 250 unsubsidized dwelling units. Meanwhile seven other architects were brought in for the design of the rest of the project. These include Giorgio Cavagliieri (landmark restoration); Conklin & Rossant; Gruzen & Partners (systems analysis); John M. Johansen; Kallmann & McKinnell (Motor Gate Garage and Plaza for the carless island); Mitchell/Giurgola Associates; Sert, Jackson & Associates. Also involved are landscape architects Dan Kiley & Partners, and Zion & Breen, plus engineers Gibbs & Hill to do the transportation (electric mini-bus), and a pneumatic refuse system. Although original plan calls for the tallest buildings to be twelve stories at the central portion of the island dwindling to four at the water's edge, new schemes increase heights at the central portion by six stories. This might create a narrow canyon of towers lined up on either side of the main street, broken only by Sert's design which uses varying heights along this street.

**Composite models of current design for one part of Welfare Island, New York City.**

**Scattered site housing, Ithaca, New York. Werner Seligman and Associates, Architects.**


On Reader Service Card, Circle No. 364

NOVEMBER 1970 P/A
Individuality is for people not pencils. When you open a box of Eagle Turquoise 2H you expect—and get—exactly the same shading quality. Pencil after pencil. Today or next year. You'll find this same consistency in all of Eagle's 17 grades. Every grade is so distinct, its difference in shading is clearly visible. Yet every pencil or lead of the same degree is so similar in performance, you'll never know where one starts and the other leaves off.

And if you use film, you'll like Turquoise Filmograph leads. Specifically designed for use on coated film, these flexible, plastic leads offer the uniformity you need for perfect grading.

When it comes to individuality, Eagle draws the line. Eagle Turquoise. The nation's largest-selling drafting pencils and leads.
Our Record:

There has never been a reported failure in a Hickman Gravel Stop installation. Never, ever.

The reasons are simple. First, Hickman is a total system. It's also a permanent system. Our patented compression clamp means that Hickman offers permanent protection against water damage, cracked felts, leaks, and tar drippage.

Our first system was installed more than 10 years ago in Detroit, Michigan. And, while that may not be forever, we don't know of another gravel stop that can touch us. And our installed cost is actually lower than ordinary gravel stops. And what's more, we can prove it.

Galvanized water dam is thermally compatible with the felts. Means no separations or cracks. Ever.

Extruded aluminum fascia is free-floating. Joint covers are concealed. Variety of sizes and finishes.

Patented compression clamp is key to Hickman's lasting quality. Locks down felts, locks out water. No perimeter leaks.


HICKMAN
W. P. Hickman Company, Inc.
2520 Industrial Row Troy, Michigan 48084
Phone: (313) 549-8484

Anyone can control shower temperature and flow.

Rada controls them separately.

The Rada Thermostatic Mixing Valve has dual controls. Touch one—and adjust the temperature. Touch the other—and you adjust the flow. And either may be adjusted without upsetting the other.

Reason: Rada's responsive bi-metal thermostat. It holds the temperature steady no matter how much or how often the hot and cold supplies change. This sensitivity is combined with simplicity and strength in construction.

Next time you specify thermostatic mixing valves for shower, or in matching tub-and-shower combinations, specify Rada. Made by Richard Fife, Inc. The company that's made a big business out of controlling water beautifully.

Also specify Unatap spray mixing faucets—another way to control water beautifully.

Richard Fife, Inc.
1140 Broadway, New York, N.Y. 10001
Phone: (212) 683-0745

On Reader Service Card, Circle No. 353

On Reader Service Card, Circle No. 344

NOVEMBER 1970 P/A
A new warehouse in St. Louis for Lever Brothers uses prestressed concrete double “T” slabs for flooring and roofing in order to save on-site labor and cut overall costs. The two-story structure has floor panels 5 feet 8 inches by 30 inches by 34 feet; roof panels are 8 feet by 2 feet by 68 feet. Armco’s TUFWIRE® Strand provides the uniform physical properties that give these slabs their strength. If you’re a designer or engineer and you’d like more information on prestressing, write for our booklet, *Prestressed Concrete: a Growing Concept in Construction.*

TUFWIRE is another fine Union Wire Rope product made by Armco Steel Corporation, Dept. K-1480, 7000 Roberts Street, Kansas City, Missouri 64125.
Office Building

Boston, Massachusetts
Marcel Breuer and Herbert Beckhard, Architects

At the rear of Boston's new City Hall and the New England Merchants National Bank building will rise a 44-story office tower and pedestrian arcade. The building, the highest in this waterfront redevelopment area, has a stepped back configuration to "blend" with both adjoining office towers and Faneuil Hall and Faneuil Hall markets. The tower rests on a five-story base (with 33,000 sq ft per floor) housing mechanical equipment and two floors of offices. Contained within the overhang of the five-story base is a pedestrian arcade that runs along the back of the building from State Street to Faneuil Hall Square. The steel-frame structure is clad with precast concrete panels which project from windows to provide a screen from the sun and to contain mechanical services. Total gross area of the building is 900,000 sq ft.

Herbert F. Johnson Art Center
Cornell University, Ithaca, N.Y.
I.M. Pei and Associates, Architects

Now under construction on the Cornell campus is a 60,000 sq ft art exhibition, storage and teaching facility. Sited for a slope overlooking nearby Cayuga Lake, the Center comprises a series of levels, six above grade, two half-levels and a service level below. A tower incised by elevator and stairway slot contains exhibition galleries on lower floors, then administration offices, print galleries, and finally, meeting rooms on the top floor. Additional exhibition space (galleries total one-fourth of the building's square footage) occupies the open side. The open portion in fact includes a mid-air sculpture terrace. Cantilevered over this terrace is a lounge area and behind it a study and storage center. The $3.575 million structure is board-formed concrete with Welsh quarry tile in lobby and terrace floors; other floors will have wood strip surfaces.

Bank of Washington Plaza
Tacoma, Washington
Skidmore, Owings, Merrill, of Portland, Oregon, Architects
Lea Pearson & Richards, Associated Architects

The first high-rise office building to be built in downtown Tacoma in 40 years is soon to be completed. The building, which at 24 stories could qualify as a Chicago low-rise, will offer a landing facility for helicopters on the roof, and a grade level plaza and below-grade courtyard and restaurant. The reinforced concrete structure provides 432,115 gross sq ft. Because of the building's load-bearing walls and inner structural core housing elevators, utilities and mechanical equipment, the column-free interior allows more than 85 per cent of the 15,210 sq ft per floor to be used. Additional space for mechanical equipment is provided at the roof.

Las Vegas City Hall Complex
Las Vegas, Nevada
Daniel Mann Johnson & Mendenhall

Projected for a transitional site between the main downtown gambling area and a decaying residential section, this city hall complex may offer some competition to all of that Vegas electrographic architecture. The complex will replace an existing 30-year-old facility on the same site: it comprises an office building (left), a police building (top), council chambers (bottom), all connected by a three-story circulation ring and horizontal tube to a public parking garage and heliport. The 240,000 sq ft building has a poured-in-place concrete frame and is clad with precast concrete panels, travertine marble, bronze anodized aluminum and bronze plate glass. The office tower elevator core is slipformed.

Multi-Use Complex
Denver, Colorado
RTKL, Inc. Architects

A design competition sponsored by the Denver Urban Renewal Authority in the Skyline Renewal area has resulted in the selection of RTKL, Inc. as architects for the $20 million project. The one and a half block area will include 387 high-rise apartments, a 400-unit motel, shops, restaurants and recreation facilities, an office tower that uses air-rights over the street and an 800-car parking garage. A second-level pedestrian walkway will link this complex to adjoining developments and will connect second level plazas. Structure and materials are yet to be decided.
brawny

Checkmate's new Number One Series concealed overhead door holder and stop; for heavy duty and value.

Modern design . . . fingertip hold-open control . . . extreme shocking tolerance. Non-handed, for single or double acting doors.

One of a complete line of door holders and stops, from the new RIXSON company –

CHECKMATE
A Division of Rixson Inc.
9100 W. Belmont Ave.
Franklin Park, Illinois
In Canada: Rixson of Canada, Ltd.
Architect John A. Benya must love All-Electric design. It gave him the freedom to design a heart-shaped bank.

John A. Benya won't build anything unless it's All-Electric—the most flexible approach to total environmental control.

The people at the Creve Coeur Bank in Creve Coeur, Missouri, bought this concept when they asked him to design a new bank. Now the town of Creve Coeur (French for broken heart) has an All-Electric bank in the shape of a heart. Two years ago Mr. Benya used the freedom of All-Electric design to build a football-shaped bank.

For the Creve Coeur Bank, Mr. Benya used electric baseboard units plus supplemental heating units in the environmental control system. This system allows the bank to heat one area while cooling another. The system is totally flexible and it gives the freedom to expand the building when necessary.

Electric heat is clean. And there's no loss of energy because the source of heat is right in the room. So you don't lose heat transporting it down the line.

With these advantages, you can understand why so many commercial buildings are going All-Electric. Talk to your electric utility company today.

Live Better Electrically

@ Edison Electric Institute, 750 Third Ave., New York, N.Y. 10017
Ficker Was Quicker

It's not often an architect makes front page news for almost two weeks running. William P. Ficker did. The 42-year-old architect from Newport Beach, California, with his own firm made headlines as skipper of the “Intrepid,” America’s Cup winner. With a young crew of 11, the 12-meter sloop beat the contender Gretel II of Australia, in a suspenseful meet that wasn't decided until the fifth race when the Intrepid had its fourth victory over Gretel II. Ficker, known for his attention to detail in his architectural work as well as his sailing, has frequently compared his avocation to his profession: “In architecture, the goal is seeing all the parts come together in an esthetically pleasing building. In sailing, all parts come together in a fast winning boat.” Nevertheless the Americans have to admit this year that the attempt to take away the cup was formidable. Although Americans are known to employ the most technical advances in their sailboats, this one, an Olin Stephens' design with modifications by Britton Chance, Jr., defeated the wild and woolly Aussies by narrow margins in all except the last race. Ficker apparently remained calm throughout.

Ford Funds Back Construction Study

The Ford Foundation has awarded a grant to Harvard University for a continuing study of construction industry problems. To be carried out in cooperation with the Construction Industry Foundation, the study will cover the bid-pricing system, manpower planning, collective bargaining methods and proposals for their reform and factors affecting productivity in construction. John T. Dunlop, a David A. Wells professor of Political Economy at Harvard and Dean of the Faculty of Arts and Sciences will be in charge of the research project.

Pennsylvania Avenue Plan Gets Backing

Architects have again taken a strong hand in plans to redevelop (or rather rehabilitate) Washington's Pennsylvania Avenue between the Capitol and the White House. AIA witnesses strongly supported House bills (also backed by the Nixon Administration) which would set up a “Federal City BI-Centennial Development Corporation” for restoration of “the avenue.”

The proposed corporation could plan and execute private and public development in an 18-block area, could borrow from the Treasury to help finance its schemes, could assemble blocks of land for development by private investors to introduce business and residential uses of the now rundown areas interspersed with huge blocks of federal buildings. The legislation itself, however, seemed to have little chance of action at this session of Congress.

HUD Funding Has Some Changes

Struggling toward adjournment in early October, Congress concentrated on the belated passage of annual money bills. It admitted that it had dawdled so long it couldn't get around to legislative breakthroughs of any kind — in fact, it could reach no bold new programs at all.

One example was the $4 billion authorization for the Housing and Urban Development Department and various associated agencies. In general, the bill simply continues all existing HUD programs, ignoring Secretary Romney's attempts to reschedule the many arms of his sprawling agency that pertain to housing. But it does contain some changes of significance: (1) it permits for regular middle-income families to invest in federally aided low- and middle-income housing; (2) it changes the down payment formula for regular middle-income FHA homes to make more housing available to families above the poverty level; (3) it authorizes subsidies to help meet operating deficits of public housing authorities; (4) it provides some subsidies for city transit systems to help meet recurring debts; (5) it provides federal guarantees to private builders who set up complete “new towns” and federal payments of up to 80 percent

News in Capitol on Pennsylvania Avenue Plan, DOD Bidding, Construction, HUD Funding

BY E. E. HALMOS

In fact, at the end of September, the AIA with Board approval reinforced its objections of new Standards of Ethical Practice, which include the following significant paragraph:

“No. 6 — An architect shall represent truthfully and clearly to his prospective client or employer his qualifications and capabilities to perform services. After being selected for his professional qualifications, an architect shall reach an agreement... as to the nature and extent of the services he will provide, and his compensations...” That's a far cry from what the Pentagon has decreed.

(As of press date, the AIA has reported Congress' approval of a bill halting new A/E procurement procedures by the DOD. If Nixon signs, existing practices will be kept.)
Knoll International

William Stephens designs for Knoll. These light, strong, laminated wood chairs, for office and home, were selected by Industrial Design's 14th Annual Review.

Knoll International operates in 31 countries.
Consider Lok-Stress® Pre-stressed Strand

Others did. For very specific reasons. At the Southside Junior High School Lok-Stress was specified to overcome high prestress losses due to the use of lightweight concrete. An initial tension of 75% of ultimate strength was required to provide a final prestress force (after all losses) of 60% of ultimate strength.

The problem was different for the Willow Street Vocational School. Uniform camber was required over the entire roof area. Lok-Stress Strand gave the designers controlled camber and a prestressed concrete member that fully complied with ACI 318-63 requirements for ultimate strength and stress at design loads.

At the Anderson Service Garage, Lok-Stress minimized prestress losses and provided full load capacity in long spans required by the design, with a reduction in number of strands required. Positive control of camber. Predictable performance. Increased load capacity. Increased span... all are structural advantages of improved 270 Grade (ASTM A 416-68) Lok-Stress Strand.

But there's another advantage. Lower cost. Lower stress losses. Minimum yield strengths at 90% of ultimate strength and relaxation of the strand permits fabricators to use fewer strands per member, thereby reducing costs.

For complete information on CF&I Lok-Stress Strand, contact the nation's largest manufacturer of prestressing strand, CF&I.

Willow Street Vocational School — Lancaster County, Pennsylvania
Owner: Lancaster County Vocational Technical School Authority
Architect: Buchart Associates, York
Engineers: Buchart Associates, York
Prestressed Concrete Fabricator: Kurtz Precast Corp., Ephrata
Contractor: Herman Wohlsen's Sons, Inc., Lancaster
Prestressed Strand: CF&I Lok-Stress

Anderson Central Services Garage — Anderson, Indiana
Owner: City of Anderson
Architect: Johnson Ritchart and Associates
Engineers: Johnson Ritchart and Associates
Prestressed Concrete Fabricator: Construction Products Corp., Lafayette
Contractor: A.B. Cochran and Sons, Inc., Indianapolis
Prestressed Strand: CF&I Lok-Stress
File for Original Drawings
Indexed for quick filing and retrieval, original drawings are also protected from handling and filing abuse in Masterfile. Drawings are attached to self-adhesive hangers which act as file supports and carrying handles. Plan Hold Corp. Circle 101 on Reader Service Card

Plastic Plumbing Wall
Vinyl and fiberglass reinforced plastic wall surfaces, vinyl piping and a foam core comprise plumbing wall assembly for bathrooms and kitchens in new or older buildings. Alternate piping materials can be substituted where necessary; walls available in any size, varied textures and colors. B.F. Goodrich Chemical Co. Circle 102 on Reader Service Card

Lexan Light Globe
Seamless globe made of General Electric high-strength, unbreakable Lexan is locked to its globe holder with a special device to make the fixture vandalproof, according to manufacturer. Packaged with pole, or globe and holder may be mounted to existing standards. Trimplex Products. Circle 104 on Reader Service Card

Clean Fire Protection
Fire extinguishing agent quickly snuffs out fire without leaving any residue. By chemically interfering with the chain reaction that causes combustion, the new “clean agents” protect valuable objects, records or delicate electronic equipment. Manufacturer recommends its use in museums, libraries and computer centers as well as standard applications. The Anaul Co. Circle 105 on Reader Service Card

Wash Center
Compact stainless steel wash center is designed specifically to provide clearance for wheel chair users; installed height from floor to bowl bottom is 29¼", depth front to rear, 17¾". Bradley Washfountain Co. Circle 106 on Reader Service Card

New Colors for Flooring
Vivid bay leaf, paprika, nutmeg and curry colors have been added to Azrock’s vinyl asbestos Custom Cortina floor tile series for heavy traffic use. Flecks of color-chips pattern the tile, which comes 12” x 12” in two gauges — ⅜” and ¾”. Azrock Floor Products. Circle 107 on Reader Service Card

Folding Shower Seat
Tucked into a corner, this stainless steel shower seat folds up when not in use. For hospital, and nursing home use; measures 15¼” x 15¼”. Bobrick Architectural Service Dept. Circle 108 on Reader Service Card

Cushioned by Chemistry
Fresh out of the lab comes Omalon carpet cushion — tough, resilient and lightweight — the result of a polymer chemical development. Guaranteed by the company not to break or pack down, it is available in flame retardant grades which pass government flame spread tests. Olin Corp. Circle 109 on Reader Service Card

On Again, Off Again
Automatic on/off lighting, combining photoelectric and time control, is available with reserve power for a 7-day unit (daily programming which can skip operation on weekends and any preselected days). Should power fail, a built-in precision spring mechanism takes over to keep the time control operating up to 36 hours. Tork Time Controls. Circle 110 on Reader Service Card

Stone/Plywood Siding
Colorful aggregate stone is laminated to exterior grade plywood and coated with a solvent-free epoxy to make Sanspray, a lightweight, low maintenance panel suitable for application as spandrels, fascias and cantilevered walls. Aggregate comes in two sizes with wide color and size range. U.S. Plywood. Circle 111 on Reader Service Card

Glare-Check Glass
Glare and light are controlled by polarized window glass, both in interior and exterior areas. Can be installed with neutral tinted windows for cost savings. Maximum size panel 48” x 96”. Polacoat Inc. Circle 112 on Reader Service Card

(Continued on page 60)
Activated Carbon Filter
Activated carbon filters for odor control of gases and vapors is described in a six-page bulletin. Due to its high affinity for a wide variety of odors — human, animal, and chemical — these filters effectively eliminate contaminants from outside air for airports, hospitals, and other facilities. American Air Filter Co., Inc. Circle 117 on Reader Service Card

Single Width Partition
Series “4” drywall partitions offer one constant 4” out-to-out dimension for nonload bearing interior wall use. Use of any standard door frame with a 4” throat simplifies design; brochure describes three basic assemblies. United States Gypsum. Circle 121 on Reader Service Card

Site Light
Uniformity of illumination, minimum glare is promised for landscape fixtures with clear or bronze tint acrylic enclosures. Two sizes: 28” overall, 400W mercury vapor series for large areas; 100 to 175W up to 16’ overall. Color booklet from Moldcast Manufacturing Co. Circle 122 on Reader Service Card

Steel for Schools
Brochure shows how sheet steel siding, roofing and other construction materials can be used to build a school environment conducive to learning and capable of being altered and expanded. SG-138 Steel Products News Bureau. Circle 123 on Reader Service Card

Picture the Computer
Digital data is converted into graphic presentation by incremental plotter which cuts drafting, checking and rework time, offers many possible solutions to a problem. Color brochure. University Computing Co. Circle 124 on Reader Service Card

Fluorescent Lamp Ballasts
Basic data for ballasts for fluorescent lamps is offered in a 32-page catalog. Operation and care of ballasts, wiring diagrams, and new ballast listings are included. A new cross-reference guide also is available. Universal Manufacturing Corp. Circle 125 on Reader Service Card

Floored by Nuclear Research
Hardwood parquet impregnated with plastic then exposed to gamma rays results in Gammapan, a solid wood-plastic composite. Looks like wood, is suitable for heavy duty commercial and residential flooring. Tests indicate Gammapan LB Flooring has bactericide qualities. Brochure: The American Novawood Corp. Circle 126 on Reader Service Card

Glazed Concrete Block
A 16-page color brochure covers the color, texture, scale, and pattern of Spectra-Glaze glazed masonry including scored, design, and standard series. The Burns & Russell Co. Circle 116 on Reader Service Card

Multiple Use Floor/Ceiling System
A long span composite floor/ceiling system which permits floor spans to 32’, and incorporates various mechanical services is described in this 32-page catalog. Optional services include air and electrical distribution, air diffusion and acoustical control, recessed lighting. H.H. Robertson Co. Circle 120 on Reader Service Card

Study Aids
Examination Handbook 1-2-3 contains all three examination handbooks previously published by Architectural License Seminars. All subjects on the architectural licensing examination are covered, including over 900 simulated questions and answers, plus complete solutions to the problems of the last three Architectural Design and Site Planning examinations. Also just published is “Problems and Solutions,” a comprehensive collection of problems based on past examinations in site planning and architectural design given by NCARB. Architectural License Seminars. Circle 119 on Reader Service Card

On the Beam
Structural, insulating roof decking is also a finished exposed-beam ceiling whose rafters span up to 6 ft. The whole story in color catalog from The Homasote Co. Circle 118 on Reader Service Card

Plumbing Noise Control
Sound conditioning compound, designed to muffle the sound of water flowing through plumbing and heating lines, is described in a catalog available from Kopper Kote, Inc. Circle 119 on Reader Service Card

Getting a Fair Shake
Looks like wood shake siding — yet offers all the advantages of solid vinyl siding — excellent insulating properties, low maintenance, weather- and fade-resistant colors. Shake siding in white, avocado green, and charcoal gray; clapboard-styled sidings in yellow too. Bird & Son. Circle 114 on Reader Service Card

Mail Lock Box
Vertical mail boxes, which can be keyed to apartment door locks, have solid ½” extruded aluminum doors and concealed hinge and frame. Available in clear, satin or gold anodized, or painted bronze finish. American Device Mfg. Co. Circle 116 on Reader Service Card

Activated Carbon Filter
Activated carbon filters for odor control of gases and vapors is described in a six-page bulletin. Due to its high affinity for a wide variety of odors — human, animal, and chemical — these filters effectively eliminate contaminants from outside air for airports, hospitals, and other facilities. American Air Filter Co., Inc. Circle 117 on Reader Service Card

Single Width Partition
Series “4” drywall partitions offer one constant 4” out-to-out dimension for nonload bearing interior wall use. Use of any standard door frame with a 4” throat simplifies design; brochure describes three basic assemblies. United States Gypsum. Circle 121 on Reader Service Card

Site Light
Uniformity of illumination, minimum glare is promised for landscape fixtures with clear or bronze tint acrylic enclosures. Two sizes: 28” overall, 400W mercury vapor series for large areas; 100 to 175W up to 16’ overall. Color booklet from Moldcast Manufacturing Co. Circle 122 on Reader Service Card

Steel for Schools
Brochure shows how sheet steel siding, roofing and other construction materials can be used to build a school environment conducive to learning and capable of being altered and expanded. SG-138 Steel Products News Bureau. Circle 123 on Reader Service Card

Picture the Computer
Digital data is converted into graphic presentation by incremental plotter which cuts drafting, checking and rework time, offers many possible solutions to a problem. Color brochure. University Computing Co. Circle 124 on Reader Service Card

Fluorescent Lamp Ballasts
Basic data for ballasts for fluorescent lamps is offered in a 32-page catalog. Operation and care of ballasts, wiring diagrams, and new ballast listings are included. A new cross-reference guide also is available. Universal Manufacturing Corp. Circle 125 on Reader Service Card

Floored by Nuclear Research
Hardwood parquet impregnated with plastic then exposed to gamma rays results in Gammapan, a solid wood-plastic composite. Looks like wood, is suitable for heavy duty commercial and residential flooring. Tests indicate Gammapan LB Flooring has bactericide qualities. Brochure: The American Novawood Corp. Circle 126 on Reader Service Card
A complete line of advanced architectural hardware, including the Sargent Maximum Security System
Ponding causes a whole deluge of problems. Zonolite roof deck systems turn them off.

Zonolite® has roof decks for everything. For the slope-to-drains. For hurricanes. For protection against fire. And for insulation.

Roof deck systems certified by Grace-Zonolite. Available everywhere in the U.S. and Canada. Installed by approved applicators each and every month of the year.

Just talk to your local Zonolite representative. He’ll be pleased to consult with you and come up with a recommendation that will satisfy all your design requirements.

Want to correct a roof deck problem. Or better yet, prevent one in the first place? Say the word!

ZONOLITE
W. R. GRACE & CO.
62 Whittemore Avenue
Cambridge, Mass. 02140

Just say Grace.
“The most stimulating important thing about tomorrow is not technology and automation but the new relations that will arise among human beings. I imagine that people will gradually come to be able to live their daily lives without losing childish innocence and ideals, which will indeed become recognized in all our activities and cease to fall victim to disparagement. Therefore, if we want to know what tomorrow will be like, let us look at our children.” This glimpse of the future was given to us by the oldest youngster in the design professions, Buckminster Fuller.

The theme that runs through this issue of P/A is children, who are the true measure of architecture, for they experience the language of architectural space, texture, color and sound through all of their sensibilities. We begin with a children's museum where learning about the structured official world of knowledge is the building's function. We show children's shops designed to vend toys for siblings who as adults will be the future clients of architecture. There is also an almost antiarchitectural learning structure which is a therapeutic environment for children who are so physically handicapped that they cannot play and are therefore incapable of using their bodies as learning devices.

In the shops, learning has been formalized into what adults feel is training for a totally man-made environment. However, the assumption holds true for only a small percentage of today's children. It is not the case with the disadvantaged child. His toys are the accidents of our productivity, the broken discards of an affluent society; abandoned automobiles in the streets, the refuse of vacant lots, or the vandalized structures of abandoned buildings. Yet such undesigned “toys” make up an environment closer to that sought by modern architecture than the controlled environment of total design.

Toys and play are not innocent. A society can be gaged by the way it teaches its children to play and the toys it gives them to play with, as a cat playfully teaches its kittens to hunt and kill. Play shows each child the place that society has chosen for him. The architecture here for children tells us a good deal more about ourselves than perhaps we care to perceive.

The affluent city child in the toy store is instilled with the idea that everything in the world is and can be man made. Even his most intimate possessions, his toys, are man-made directives. In the past stimulations associated with childhood had not been designed into our environment. They were considered childish and it was taken for granted that the older we become, the less joyful, the more disciplined and structured our environment must become. This is no longer true. A conscious effort is now made to bring some of the direct joyful experience of the child into the adult world of modern architecture; supergraphics, mannerist structure, playful space and color are becoming commonplace.

The theme that runs through the words of men of such divergent formal convictions as Frei Otto, Buckminster Fuller, John Andrews, Christopher Alexander, the architects of the third generation of modern architecture, is that the importance of architecture is in its meaning to the building's user.

“In this age of so-called objectivity, we close our eyes before the limits of the 'objective' and damn the nonobjective even when it is needed. If we want to define more precisely the task of all those involved in building — the architects, engineers and artisans — it is not to build an apartment house, a schoolhouse, a coffee shop or a theater, but to make a good place to live, to learn, to eat or to have some other specific experience,” are the words of Frei Otto.

Christopher Alexander put it the most succinctly of all, “If you want to make a living flower, you do not build it physically with tweezers, cell by cell; you grow it from seed. If you want to design a new flower you will design the seed and let it grow.” It can undoubtedly be proven that people's learning capacity decreases as they grow older, but it is also true that less consideration is given to the architectural devices that excite, stimulate, communicate and teach them.

If we are to “seed” an environment as Alexander says, we must, to realize Fuller's future, to create Otto's “good place to live,” begin with an awareness that satisfying the preceptual needs of childhood is a sign of emerging architectural maturity. The children shown in these buildings in this issue of P/A tell us more about the meaning of our architecture than façade, plan or section.
MUSEUM PLAY-IN

Architect William Morgan designs a geometric module to house the ever-growing Jacksonville Children's Museum.
The Jacksonville Children's Museum, a gleaming fortresslike structure designed by architect William Morgan, provides efficient new space for an innovative institution. The museum had long outgrown its former quarters and, anticipating that expanded facilities will again be required within a few years, was designed to double its size with a modular addition.

Originally organized by three school teachers who prepared youth displays in the windows of a local bank, the museum had been housed in an old wood-frame residence since it was chartered 22 years ago. From the beginning it has served to supplement both elementary and high school curricula. An instruction program coordinated with the county's school system offers Saturday and after-school classes in arts and sciences, while exhibits acquaint visitors with regional history, culture and natural sciences of northeast Florida. The museum's multisensory exhibition techniques encourage visitors' active participation.

In recent years, Jacksonville's tremendous growth has swelled museum attendance to over eighty thousand...
The museum is designed as a module to facilitate easy expansion. The second stage (shaded area) will include more art and science classrooms, a 250-seat lecture hall and more than double exhibition space.
annually, and the old frame building had become completely inadequate to meet the needs of the community. Moreover, the toll of millions of footsteps and rising maintenance costs had threatened its very existence.

The City of Jacksonville came to the museum's aid with a donation of land, hoping also to revitalize cultural interests in the downtown area. The site is located on the southwest corner of a heavily used public park and marina, along a curvature of the St. John's River. It is adjacent to the park's Friendship Fountain and a major expressway. At ground level the museum is clearly visible from all sides, while the nearby Gulf Life complex, Prudential tower, Sheraton Hotel and other tall buildings across the river provide a view from above.

In designing ample space for the museum's two-fold program, architect Morgan has provided a structure with separate yet interrelated areas for teaching, exhibition, administration and service. The plan consists of a central core containing an entrance lobby, two exhibition levels, and a roofgarden, surrounded by four towers that accommodate classrooms, offices and service space. While circulation on exhibition levels...
is planned so that visitors can view all displays in sequence without retracing steps, secondary stairwells within the towers permit students to enter classrooms directly from the lobby without passing through other areas. These also permit horizontal access from classrooms to exhibit and roof levels via alternating stair landings.

The museum's main entrance is approached from a gentle ramp partially sheltered by projecting upper floors, which help protect school bus loading from inclement weather. Once inside, visitors are greeted by an 11-ft-high allosaur skeleton along the southwest wall. Portals at the lobby's four corners provide access to the four tower areas. The planetarium is specifically located off the lobby so that it can be used for public shows and lectures when the rest of the museum is closed. Visually dominating the space is a skylighted central stairwell that rises 40 ft and controls access to exhibition levels and the rooftop garden. The stairs were originally designed to float freely from stairwell walls, but fire codes regulated that they meet the walls to close the space; what could have been a light, open area is now darker and less dramatic.

The second level of the central core contains permanent exhibits in the form of "environmental chambers"—three-dimensional reconstructions which, for example, enable the child to stroll down an old Jacksonville street as it appeared at the turn of the century, to walk into a pioneer block house of the 1850s, to enter a Timucuan Indian hut, to visit a general store (photo, above) and a typical residence as it was before Jacksonville's historic fire of 1901. Children can sit on the furniture, try on the clothes and hear sounds typical of each historic era. Transitional zones between building replicas display plants and animals of a pine forest, cypress swamp, seashore and life under the sea.

The third level contains temporary exhibits on topics of current interest, and are accommodated by variations in floor level, and movable walls and cases. Children can view a light show, touch a replica spacecraft, operate a scientific instrument board to see how it really works. Multimedia audiovisual systems explain relevant aspects of transportation, commerce, agriculture, industry and similar subjects.

The roof level makes maximum use of the building: a rooftop garden (not yet completed) will accommodate botany experiments, small observatory, art classes and sculpture exhibits, while a small zoo and an aviary will house animals and birds native to the region. A picnic pavilion on the east tower will serve the many visiting school classes.

While the new museum contains 29,810 sq ft of enclosed space (the rooftop garden provides another 9,275 sq ft), a twin module will eventually double on-site capacity (a rural farm several miles from the downtown site further expands the museum's program). It will include more art and science classrooms, a 250-seat lecture hall and will more than double the exhibition space.

The project fulfills the highest hopes of architect, client and the public. No longer will a dedicated museum staff be expected to produce imaginative exhibitions and instructional programs with inadequate means. According to museum director, Mrs. Doris Whitmore, "It functions most efficiently in terms of the visiting public and has adopted itself quite flexibly to our complex operational needs." For the public, children and adults alike can be drawn into exciting learning experiences never before available in the city. Indeed, the public is taking full advantage of the new opportunities offered: "We expected about 200,000 visitors during our first year," suggests Mrs. Whitmore, "but by current attendance figures we may have as many as 320,000." For the city, the new building provides a bold focal point—a new jewel in Jacksonville's growing cityscape.

While exterior glass is minimal to avoid sunlight distraction in gallery and class areas, the first floor lobby (photos, upper right and lower left) is almost entirely glass enclosed. After museum hours, casual strollers can peer inside from viewing platforms to see an 11-ft high allosaur skeleton, sample displays of new exhibits and announcements of current museum activities. Permanent exhibits in the form of 3-dimensional reconstructions invite visitors to actively participate (photo, upper left). Temporary exhibits, such as the Apollo Space Project (photo, above), include flashing lights, multislide projections and individual telephone messages.
As theory and experiment sweep the nation's schools, the architecture follows suit. Two schools in the California Sierras, designed several years ago under new guidelines, are reviewed here after several years of use. Programs for both included open classes, team teaching, nongrade groupings — all demanding highly flexible physical plants. The curriculum and theories under which they operate are aimed at the individual developing at his own rate in areas of his own interest. Architects for both schools are Van Bourg-Nakamura.
In harmony with the landscape, a rough textured cedar plywood, painted in bright colors, was used for exterior finish.

For the Meyers Elementary School (completed 1967), the superintendent and school board had specified an open building for nongraded primary grouping and team teaching. The architects responded with a concept virtually devoid of corridors. Instead, three instructional units are grouped around a central project area. Each includes a four-teacher open space and two self-contained classrooms, one of which is large enough to seat two full classes for special instruction. Of the latter type, one, used for kindergartens, has a folding partition and an annex for separate entrance and toilets.

The core that forms the center of the instructional units themselves consists of a large resource center-cum-library, an arts and crafts room, pupil personnel services, a teachers' preparation room and a radiant-heated open courtyard. An administration and multi-use unit with stage and kitchen abuts the core's fourth side and completes the Greek-cross plan.

Since similar site and weather conditions prevailed, design data from the earlier South Tahoe High School was useful in defining a structural system. Concrete bearing and lateral

A belief in integration and open-endedness is embodied in architects Van Bourg-Nakamura's design for South Tahoe High School (completed 1966). Stanford University provided a computerized "flexible scheduling" program that emphasizes differences in student, teacher and subject area within a total quantity of time. Conventional classrooms are relatively few, yielding to larger spaces, often sloped or stepped, that permit such varied activities as lectures, independent studies, seminars and simultaneous small classes.

Institutional images and attitudes are absent from this crisp wooded setting. Buildings of different size and function are clustered to create an intimate campus — avoiding urban density, formality and anonymity — while preserving much of the naturally landscaped site. An open atmosphere is furthered by avoiding covered walks, and the problem of snow accumulation is solved instead by heated paths that use excess steam from the central heating system. The positive values of the area's snowfall are exploited in a unique ski
support columns were again used with a roof and girder system designed for 100 lb per sq ft snow loads. For maximum flexibility, all interior and exterior walls are non-bearing and nonshear. Here, as at the high school, concrete columns were erected first, ready to receive roof structures and snow loads within two or three months of ground breaking. In this way all interior work, including installation of mechanical systems, pouring concrete floors and erecting partitions, could proceed throughout the winter.

In harmony with the forested mountain landscape, a rough textured cedar plywood was used for exterior finish, treated in bright colors for contrast against the severe whites of winter. Inside, too, bright colors serve to identify individual areas in the open, structurally undefined classrooms.

Reaction to the school, particularly on the part of teachers, has been as much a reaction to new techniques and approaches as to the buildings themselves. The architects involved themselves to an unusual degree in ironing out difficulties of adjustment with the teaching staff. Seminars, which might more properly be called "gripe sessions," were arranged to discuss the uses of this new tool for education, and many of the negative feelings inevitably associated with the unfamiliar were worked through and exchanged for positive attitudes.

Although problems with noise levels have been felt in some double classrooms, teachers appreciate the opportunity to constantly create new activity centers through rearrangement of tables, desks and movable cabinets maintained and shared by the entire group. The variety of activities offered the children, who may move on to a new one only after the one they are engaged in has been successfully completed, provides a new impetus for achievement as well as a sense of individuality in terms of pacing and interest.

five times the roof loading required in the San Francisco Bay Area), melting and run-off characteristics. These horizontal planes are broken here and there where a special interior function demands expression.

The demand for flexibility in interior spaces is reflected on the exterior in a relaxed aesthetic that employs natural finishes suitable to a rustic environment. Formal or sentimental values were eschewed, for example, in the omission of roof overhangs, so often associated with Alpine architecture. Roof drainage is provided internally, where heat maintains flow.

Budget considerations and unpretentious design influenced the decision to expose roof structural elements. This allows easy repartitioning and wiring — essential to a program dominated by flexibility.

Four years later Anthony J. Magliali, superintendent of schools, reports that the potential for flexibility is unlimited. The open space carpeted area has housed a seminar, small group conferences, centers for individual study spaces and two satellite libraries which are used extensively. The departmental office space has promoted communication among staff members as well as production of teaching materials. He also notes that the cluster arrangement allows for good circulation. Because the auditorium building and the gymnasium are so accessible to the public, the school is developing into a community center.

"There are some inadequacies in the plant," he adds, "but these will be corrected when the second phase of the building program gets underway. We need more physical education facilities, special education classes, cafeterias space, a student lounge and a production center."

The students, meanwhile, remain enthusiastic. One reports, "I love the whole school. It builds morale and makes the kids want to study harder. It's just like a college campus."

SOUTH TAHOE HIGH SCHOOL, South Lake Tahoe, Calif. Architects: Van Bourg-Nakamura & Associates. Site: A flat, heavily forested area, with mountains in background. Program: Open, flexible building for nongraded primary grouping and team teaching that could be converted to conventional classrooms if necessary. Structural System: Concrete bearing and later- support columns, supporting glu-lam girders, roof joists and plywood roof diaphragm, with buildings raised on five-foot pad of engineered fill due to swampy site. Major Materials: Exterior finish of rough-textured cedar plywood; carpeting throughout academic and library areas. Cost: $805,000; $12.60 per sq ft (buildings only). Consultants: O'Kelly & Schoenplank, Mechanical; Butzbach/Bar-Din, Structural. Photography: Julius Shulman.
The library-resource-study center right is a space gleaned from savings of "corridors" within the state-aid square footage formula.

Teachers appreciate the chance to create new activity centers through rearrangement of tables, desks and cabinets.

The gymnasium and theater alone have load-bearing walls, since their functions are stable (above). Conventional classrooms are few, yielding to larger stepped spaces for varied teaching situations (right).

Photos: Mitchell Van Bourg
Most children's stores, from both a physical and a mental viewpoint, are designed for adult shoppers rather than for the real customers — the children themselves. The three shops presented here have adopted a new approach — providing a playful, educational and aesthetic child-oriented environment — to encourage his involvement in shopping.

To achieve this marketing goal, each shop is designed to accommodate the child's size, comprehension level and physical capabilities, while bright colors, bold forms and graphics stimulate his awakening aesthetic sense. Each contains features other than merchandise to engage the child's interest in an activity suitable to his age, with little distinction made between merchandise displays and play equipment. A
selling table, for instance, is also a playhouse: children can literally poke their heads up through the table to see merchandise. By physically participating in the environment, the child discovers merchandise to suit his needs and desires. Even though he may not control the actual purchasing transaction, his reactions to his surroundings influence the child’s selections.

For the child, shopping thus becomes a positive experience, rather than the usual bore of the adult environment and frustration of “do not touch.” The success of these shops emphasizes that children, as intelligent and responsive market prospects, can be approached through advanced marketing methods, and suggest that retailing for the child sector is due for major changes.

Neon monogram invites customers into store (above) where children can sample the merchandise in a carpeted, free-form playroom (left). Overhead slide projectors provide a continuous show. Below, thick aluminum display shelves isolate groups of toys for easy viewing and selection. Bold graphics and a color-coded system identify the age group for which each toy is suitable.

Built into display units are levers and buttons which children push to activate blinking lights and create their own electronic music (above).
An ambiguous demarcation between merchandise and playthings is an essential factor of participatory shops.

CREATIVE PLAYTHINGS, 1 East 53rd St., New York, N.Y. Architects: Godard/Hodgetts/Mangurian/Walker. Client: Creative Playthings (subsidiary of CBS). Program: Design an exciting space with facilities to sell Creative Playthings toys. Architect’s aim was to provide a single system to configure space as well as house display, light, sound toys, etc. Site: Interior of 100’ x 15’ (average) shop, adjacent to Paley Park. Design Concept and Solution: Large scale parts which fit together to shape traffic flow, display, etc. Conceptually, an aluminum set of parts within an orange tube; the parts are stress-skin type, pop-riveted air-conditioning ducts. Floors surfaced with bright orange carpet custom made by Bigelow. Mechanical System: HVAC. Costs: $59,000 or $24 per sq ft. Consultants: Jules Fisher, lighting; Morton Subotnick, sound; Edward Bernstein, aluminum fabricator. Photography: Norman McGrath.

A wood marble run (above), an oversized version of one of Creative’s products, is an invitation for children to enjoy themselves. Right, the display system throughout the store directs traffic flow and provides cashier counters in the shape of the store’s logo.
An almond-shaped cutout in the stairwell wall reveals a two-story high wood-block castle (above). Right, the display system consists of 105 interlocking, interchangeable parts for quick and easy rearrangement of the store's interior. It also houses visual, sound and lighting systems, as well as clip-on panels for supplementary graphics.
CHILD CRAFT CENTER, 150 East 58th St., New York, N.Y. Designer: Milton Glaser. Client: Childcraft Centers Inc. Program: Develop an unusual and promotable environment in which to sell toys. The client hired a graphic designer rather than an architect because the problem heavily involved graphics. Site: Approximately 4000 sq ft of ground and below-ground floor space in new office building. Design Concept and Solution: Beginning with a neon light "rainbow" facade, a circular idiom was maintained throughout. In order to organize the space clearly and to simplify the general visual chaos common to most toy stores, display bins are provided to isolate groups of toys into an understandable unit, and all areas are color coded by age for easier shopping. Materials are tough and easy to maintain (display units are plastic laminate and floors are vinyl tile). Costs: $75,000, or approx. $18.75 per sq ft. Photography: Norman McGrath.

Neon-lighted rainbow introduces the Childcraft toy-store. Two entrances are provided — one for adults and one 4-ft high for children. A half arch with lozenge-shaped openings (far right) leads to the lower sales level, which includes an artificial-grass play area with game tables and toys (above). A sound track of trains, planes, crickets and thunderstorms reverberates throughout.
The Children's Place

The Children's Place, Bishops Corner, West Hartford, Conn. Designer/Architect: George Nelson & Co., Inc. Client: Clinton Clark and David Pulver. Program: Design a children's department store that will provide a profitable base for business, and serve as a facility for testing new marketing theories about children's behavior and tastes. Site: Existing two-level space (12,000 sq ft) in a major shopping center. Concept and Solution: To provide an environment that would encourage the child's involvement in shopping, features other than merchandise (wishing well, playhouse, etc.) were placed in each department, with little distinction made between display fixtures and play equipment. All elements were determined by children's tastes, comprehension, physical capabilities and psychological adjustments. Major Materials: Ceiling is white acoustical tile, walls are dry-wall painted with brightly colored enamel, and floor is red brown wool carpet (special areas overlaid with Astro-Turf). Photography: Edward Sewe Studio, Inc.

Children enter the store through a bright yellow plywood tunnel. Each department has a different play element, the principal one being a 2-level, plywood castle (above) which includes telescopes, a slide (left), fountain and wishing well and a furnished playhouse. "Endless" funhouse mirrors occur frequently, while a strong graphic mood and vivid colors dominate the store. Even the elevator is adjusted to the child's capacity for a new experience: low windows inside reveal a rainbow painted on the elevator shaft.
Motor Planning — a consolidation of knowledge of how to move effectively in space.

Body Balance — dynamic and static.

Playing to Learn

The Magruder Environmental Therapy Complex — An adaptive playground for preschool physically disabled children with perceptual deficits.
Integration of Body Sides — understanding of back and front, up and down, left and right, externally in relation to the body.

Children play. This is such an accepted fact that it has rarely been questioned or seriously studied. But it is being investigated now because there are countless children who are denied this activity because of physical disabilities and their associated perceptual deficiencies. A question of great urgency is whether or not, and to what extent, play is important to future learning.

Normally, a child’s knowledge of himself and his surroundings begins with the exploration of his own body. From the very beginning, however, a handicapped child encounters barriers to his exploration that impair his perception of his body and his surroundings. If he cannot control the movement of his hands and feet, he will be unable to discover their functions; he may even remain unaware that they are his. Thus he may fail to reach the common levels of motor development and his motor perception may show deficiencies due to lack of experience.

But recently some startling things have been happening at Forrest Park School in Florida. A child who was thought to be physically unable to walk reached out and pulled himself up onto his unsteady, wobbly legs, without crutches; another even dared to take a few halting steps for the first time in his life. A child who could only crawl on his stomach tried so hard to reach his friends that his knees flexed and suddenly he was crawling on all fours. Another frightened, nonambulant boy, seeing his friends excitedly flopping into a falling pit, finally threw himself in and came out laughing.

Forrest Park’s playground is an environment that motivates play, where children can function freely, regardless of the extent of their disabilities, where they are simply told to “go play,” with no attempt to structure their activities, and where they can have the important motor experiences that form the necessary basis for future learning.

The school’s principal, along with a physical therapist, a physical education expert, and the designer worked together with special educators, a kinesiologist, and a psychologist to develop a set of desirable perceptual goals essential to the full development of motor perception. The playground, with equipment unlike the usual therapeutic equipment, is intended to develop 15 basic skills and was designed to allow the children free, spontaneous and unstructured play. Unhindered by their braces, yet protected by yielding surfaces, they are given breadth of experience as similar as possible to that of normal children.

The ten principal parts of the environment consist of balance beams, step progression, shelters, tunnels or caves, free-standing walls, foam pits, slides, overhead pull-ups, rolling hills, up and down ramps, and mirrors. These expose the child to the 15 perceptual goals essential to the full development of motor perception. (Although an activity may encourage the development of more than one perceptual goal, photo captions list only one important benefit of each activity.)

Learning depends on perception; if the flow of sensory experience is blocked or slowed because of an impaired motor system, then mental development cannot proceed at the nor-
mal rate. In school a disabled child may have difficulty grasping abstractions basic to academic progress. Such difficulty is often assumed to be due to low I.Q. or even to retardation. Actually, these learning problems may be the result of a lack of perceptual experience due to physical deficiencies.

The study of children who have been denied normal access to play because of their handicaps, although in its early stages, seems to suggest that play is, indeed, perhaps the first and most important step to further learning. The problem is that if it is important, how can children who seem to be unable to play be encouraged to do so?

In the past it was felt that handicapped children could not play, and no attempt was made to make it available to them. What was provided was physical therapy in clinical, fluorescent-lighted, sterile rooms with a maze of objects and contraptions where the child was forced to go through hours of discomfort, happy to get back into his wheelchair or braces until the next dreaded session. He would usually spend years doing this, with little or no results, leading to frustration or stifling of the child’s normal enthusiasm for play.

At Forrest Park the playground is an attractive, colorful, exciting atmosphere that stimulates the child’s imagination and makes him want to use his muscles. It is a continually flowing series of events and experiences that appear to the child as a fantasy world of brightly colored shapes scaled to his size, pleasant to his touch, and tolerant of his limitations. It is a place where handicapped children, who have traditionally been thought to be unimaginative, show immense creativity and invention that was not evident prior to their exposure to the environment. But most important, it is a series of potential explorations and adventures—and therapeutic exercises.

The playground is designed to allow change and experimentation by the staff, and the children themselves can manipulate many of its flexible features. The process of modification and change that was set in the early stages of design is continuing, for it is felt that no area should be thought of as permanent. The playground is being constantly evaluated, and it will be modified if there is any indication of improper muscle balance. One important aspect of the testing involves the analysis of motion pictures of the children’s activities to determine the nature and degree of muscle strengthening. Films of the children at play reveal startling occurrences that might otherwise go undetected. In one instance the film shows a child using a hand previously considered by the therapists to be unusable. Another child is seen extending an arm usually held rigidly against his body.

These tests are only a beginning; the ETC offers many possibilities for research. One proposal is to evaluate the effects of color, light, form and shape on perceptual development. But the most important test will come as the children who have used it enter the first grade. If they have fewer learning problems than similarly disabled children, it will be preliminary proof of the positive effects of the experience. The earliest observations indicate that the playground activities are yielding positive results.

MAGRUDER ENVIRONMENTAL THERAPY COMPLEX (ETC); Forrest Park, School, Orlando, Fla. Architects: Leland G. Shaw, Designer; Dan Williams, David Smith, Dwayne Crammer, Michael Weinstein, Student Design Assistants; W.G. Wagner, Research Consultant. Site: Existing 100’ x 100’ playground. Program: To create an environment with motivation through play in which physically handicapped children could function freely and acquire experience similar to that of other children, based on the precept that such motor perception experience is basic to future academic learning. Structural System/ Major Materials: Wood roof-truss system; limits of interior area delineated by concrete block retaining walls capped by 2” x 4” planks. Marine plywood shapes, some covered with exterior carpeting and some painted, formed up to wall on interior, are principal elements. General Contractor: Creed J. Clifton.

Body Awareness — self awareness and body parts awareness, weight of body, awareness of right and left hands to climb.

Directionality — movement in many directions from various planes of the body.
Relationships of Objects in Space — going around, over, under, through different objects.

Spatial Relationships — where one is in space, how much space he occupies.

Laterality — understanding of body halves, left and right.

Kinesthetic Awareness — the feel of joints and muscle movement.

Concepts about Space — the experience and knowledge gained should bring about increased understanding of the abstracts of formal learning.

Linearity — following lines out in space, knowledge of remote spaces.

Depth Perception — assessability of objects up and down in space.
It is true that if we could predict impending disaster, inefficiency or apathy, we would do our very best to avoid them. Why is it true, then, that American business sustains large losses each year from internal pilferage and overt criminal attack. Indeed, if dollars that are irretrievably lost through theft had been invested in facility design and construction, the losses might not have occurred and the retained profits could have been fruitfully used.

There are consulting firms that bring to architectural planners the opportunity to improve their design by permitting it to reflect the client's ability to control his losses, his people and his continuing operating expense. These firms elaborate upon the architect's analytical abilities by creating opportunities to reduce the potential for the criminal confrontation. This leads to additional benefits. Having reduced the opportunity for crime to occur, it becomes possible to predict reduced protection requirements to maintain an adequate level of security that can result in dollar savings to the client that could equal or surpass the original architectural fees.

By determining a client's past history of criminal confrontations, the existence of and his ability to operate internal control programs, it is possible to design a building that provides the best atmosphere for a successful security program, once aware of the client's product and its system of production.

Even with burglar alarms, it is possible to design systems to assure that alarm hardware does not destroy the aesthetic intent of the architectural plan. When considered in the very early stages, the architect can suggest cost savings for the client by recommending that alarm...
hardware be purchased rather than leased, and that it be installed under the general contract, thus allowing fixture expense tax advantages and lower annual maintenance fees (tables 1 and 2).

The early design of alarm systems has advantages. For example, in high-rise buildings the opportunity to use common raceways and electrical closets could result in substantial savings. The opportunity to determine the need for precut door bucks where electrical door controls are used can save many dollars if done by the manufacturer rather than at the job site. The design of the building core to assure that receptionist activities are confined to a public area within the core can save money in several ways: if alarm technology is appropriate, confining the distance of wire runs in installations to the building core area will result in cheaper installation, and in a better maintained alarm system, since fewer protected points are exposed to misuse or abuse. Continuing operating expenses can be reduced because it would require less staff to supervise these public areas than if they were scattered throughout the building.

If electronic alarm protection were desired, the building core plan (illustration 1) calls for wire to only three openings, marked “A.” The opportunity to reduce the distance of wire runs is substantial; the distance from the electrical closet, where raceways are available, is minimal compared to what it could be.

Quick fire exit is provided from inside the secured premises as well as from the public area. The public area is well defined, permitting individual tenants to control their own space during the day while permitting building management to secure each tenant’s space at night. Restrooms within secured space reduce the opportunity for criminal confrontation there, and provide better surveillance.

Table 1
Leased vs. Purchased Alarm System

<table>
<thead>
<tr>
<th>Leased Systems:</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
<th>5 Year Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>$1,700.00</td>
<td>$270.00</td>
<td>$270.00</td>
<td>$270.00</td>
<td>$270.00</td>
<td>$2,600.00</td>
</tr>
<tr>
<td>Annual Lease</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>6,200.00</td>
</tr>
<tr>
<td>Annual Maintenance &amp; Monitoring</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td>3,050.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Purchased Systems:</th>
<th>Installation &amp; Purchase</th>
<th>Annual Maintenance</th>
<th>Annual Leased Telephone Costs</th>
<th>$3,546.00</th>
</tr>
</thead>
</table>

Table 2
Leased vs. Purchased Alarm System

<table>
<thead>
<tr>
<th>Leased Systems:</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
<th>Direct Profit Related Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Costs</td>
<td>$1,700.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>$2,600.00</td>
</tr>
<tr>
<td>Directly Related to</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td>270.00</td>
<td></td>
</tr>
<tr>
<td>Profit Reduction</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td>630.00</td>
<td></td>
</tr>
<tr>
<td>Capital Expenditure</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td></td>
</tr>
<tr>
<td>Depreciable Fixture</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td></td>
</tr>
<tr>
<td>Type Expense</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
<td></td>
</tr>
<tr>
<td>Direct Profit Related</td>
<td>496.00</td>
<td>496.00</td>
<td>496.00</td>
<td>496.00</td>
<td>496.00</td>
<td>$2,480.00</td>
</tr>
<tr>
<td>Purchased Systems:</td>
<td>Operating Costs</td>
<td>Annual Maintenance</td>
<td>Annual Leased Telephone Costs</td>
<td>$2,440.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directly Related to</td>
<td>400.00</td>
<td>400.00</td>
<td>400.00</td>
<td>400.00</td>
<td>400.00</td>
<td></td>
</tr>
<tr>
<td>Profit Reduction</td>
<td>96.00</td>
<td>96.00</td>
<td>96.00</td>
<td>96.00</td>
<td>96.00</td>
<td></td>
</tr>
<tr>
<td>Capital Expenditure</td>
<td>-610.00</td>
<td>-610.00</td>
<td>-610.00</td>
<td>-610.00</td>
<td>-610.00</td>
<td>$2,480.00</td>
</tr>
<tr>
<td>Depreciable Fixture</td>
<td>$3,050.00</td>
<td>$3,050.00</td>
<td>$3,050.00</td>
<td>$3,050.00</td>
<td>$3,050.00</td>
<td>$2,480.00</td>
</tr>
<tr>
<td>Type Expense</td>
<td>$2,440.00</td>
<td>$1,830.00</td>
<td>$1,220.00</td>
<td>$610.00</td>
<td>$0</td>
<td></td>
</tr>
</tbody>
</table>
of visitors near those areas. Another advantage, particularly in today's bomb-threatened, high-rise environment is that the receptionist's full view of the public area reduces the opportunity to plant a bomb successfully. Indeed, burglary-resistant glass, while more expensive, may substantially reduce the client's insurance premiums as well as reduce the cost of glass replacement.

The merging of security systems with the design can save the client unnecessary maintenance costs if the systems are recessed, covered, or applied in such a way as to reduce exposure to tampering or breakage.

Door “A” (illustration 2) represents a surface-mounted switch that hangs down from the door frame about 2 in. Door “B” represents a recessed application where the switch is not observable, reducing opportunity for tampering and breakage, while maintaining aesthetic standards.

A digital entrance lock is another way to control access; such devices are frequently used in industry and government. Illustration 3 is a typical industrial application which, until recently, was the only available device. Recently manufacturers have provided devices that are recessed and available in several finishes to blend with decor. The installation costs are greater in the recessed device than in the surface mounted unit (illustration 4), but the recessed device blends with the wall, making it less imposing.

Possibly as important to the decor of the digital lock is the required use of an electric strike. If proper planning is done early in the design stage, door buck manufacturers can precut door bucks, permitting easy installation, a more uniform appearing door frame and a lesser opportunity to jam the electric strike.

Illustration 5 represents several examples that retain a high level of design while imposing restrictions on the use of the premises. In view of the fact that each of us prefers to think we are not controlled in our actions, there is an obvious benefit to establishing an acceptable level of security by merging the devices with the design.

Preplanning security in design can assume new dimensions when it is considered in site selection. Such things as terrain, highway access, population, the use of a building, capabilities of law enforcement and fire service, and trash removal service affect design. Because these factors are as predictable as those formerly mentioned, the design of a facility can compensate for shortcomings in community services while providing the client with a predictable level of security and reduced security overhead.

For example, if only one police patrol car covers 40 square miles on the midnight shift, then reducing building perimeter openings or adding alarm protection is a relevant initial design consideration. If the best available fire equipment can only evacuate personnel from a height of 60 ft, is it wise to construct the building to a height of 85 ft? If trash removal is only available from 6:00 P.M. to 6:00 A.M., one should consider designing a burglar-resistant trash hold area that does not permit access to the interior of the building (illustration 6).

The alternative to this, of course, is a potential breach in the desired level of security, or increased supervisory payroll.

Illustration 7 is an employee en-
trance to a retail store separate from the one for customers. This reduces their opportunity to enter the store while wearing outer garments or carrying containers for concealment. Because their locker area, restrooms and lunch areas are within the confines of a supervised area, they have no opportunity to enter the retail selling floor to conceal merchandise on their person. Because of the restrictions on the employee's actions, the burden of proof is transferred from management to the employee should a confrontation occur.

Many simple opportunities to improve design are available. For example, it is wise to use substantial locking hardware when hinge pins are exposed to the public side of the door; or, one could spot weld the hinge pins or use institutional hinge pins to maintain the integrity of the level of security as well as provide substantial locking hardware (Illustration 8).

Another example of value to the client may be the use of removable core or cylinder locking devices that provide greater flexibility in making lock changes at reduced cost when needed (Illustration 9).

Equipping doors with automatic self-closers and automatic deadbolts is sometimes helpful to reduce human error. In some cases the hand of a door, left or right, will be important regarding the visual security opportunity available for persons on the secured side of the perimeter area. The design can be basic or sophisticated, depending on need.

Examples of a before and after situation in high-rise office building construction are shown in illustrations 10 and 11. The first represents a building core area as originally designed. It has several frequently recurring security vulnerabilities of high-rise offices. Washrooms in the public area expose tenants to a confined and sometimes unobserved criminal confrontation; public access to private office areas is possible from the elevator area. Because of the usual requirement for extended elevator operating hours beyond normal business hours, the space continues to be exposed beyond supervisory capabilities. Another problem is the
8. Hinge pins should be concealed.

9. Lock with removable cylinder.

The entrance doors are electrically monitored so the remote receptionist will know if the doors are opened or closed and locked. Under the remote system, closed circuit television is utilized with two-way communication so that the visitor can be identified, and the person visited notified of his presence. The entrance doors can be remotely released or controlled by a digital locking device that admits only authorized code holders. In the lobby design, soft illumination of a higher foot candle was used at the electronic console as a motivational technique as well as to improve lighting standards in the television monitoring area.

To add flexibility to the use of space, the electronic unit containing television camera, monitor and two-way communications is modular so that it can be easily removed and replaced with a desk unit designed to fit in the same space. This permits changes in traffic volume to play a part in a decision to use electronics for control of people. The flexibility feature validates the cost of design and construction because space usage can be changed with minimum cost, giving the building owner a range of security to offer to potential tenants.

As indicated in illustration, 13 right, the designation “A” is an ambient light detector that serves to advise a remote receptionist that a person has left the elevator. The presence of a person passing through the detection path changes the light level and annunciates on a panel at the remote monitoring location. This serves redundantly as alarm protection during the evening. The designation “B” represents the visual opportunity of the television camera that identifies daytime customers and night-time intruders. The designation “C” represents the monitored doors. “D” represents the digital entrance control device.

What has been defined in the foregoing is simply a type of premises...
10. Risk is high in open core.

11. Public access is restricted after remodeling.

12. Electronic unit can replace live receptionist.

13. Light detector (A), TV camera (B) survey doors that are also protected by digital control device (D).

protection equation. For the architect, the equation offers the potential of saving the client’s projected operating overhead in amounts comparable to the architectural fees. For the client it provides the opportunity to improve the level of security and greatly reduce the chance of criminal confrontation. All of this can be accomplished while maintaining a satisfactory level of aesthetic design. These concepts are consistent with the philosophy of the Small Business Administration’s study “Crime Against Small Business.” They are also consistent with reducing the opportunity for the unplanned criminal confrontation.
Marseille has been living with the Unité d'Habitation for 20 years now. This building, once a battle cry of modern architecture, has become an element of the city and the theories of its architect tested by the everyday life of 1600 inhabitants (men, women, and children). The best tribute I can bring to Le Corbusier's memory is to check his intentions against the results. He once wrote, "No one is more eager than I am to correct my ideas if they are wrong." It would be an insult, to treat him as a god whose work should not be questioned, just as it was an insult to treat him as a visionary with impractical ideas.

I Functional Intentions.

The Unité d'Habitation was started in 1947 and finished in 1952. It was the first full-scale realization of Le Corbusier's 25-year-old dream of a Radiant City: clear prisms to rise above the landscape on their pilotis, freeing the ground for pedestrian and automobile circulation, for trees, gardens, schools, sports fields. "The materials of city planning are: the sun, the sky, the trees, steel and concrete" to which he added: "hotel service," the "corridor street," the "absolutely private dwelling."

I would like to examine his points as they refer to the Unité d'Habitation one by one:

A. The Pilotis.

The masonry prism is there, a powerful commanding presence like a great ocean liner in drydock. Philosophically and materially, the build-
ing is detached. There are no extensions into its surroundings, except the main entrance hall and the fire stairs which dramatically reach the out-of-doors some 15 feet in the air. What is more, they are an invitation for use, because they are the quickest exit from the two lower “street-corridors”.

The pilotis are used without formal compromise; the area below the building is completely open (above). In spite of their plastic value, however, they are calamitous from a practical point of view. The mistral, that famous wind which roars down the Rhône valley, strikes Marseilles from the northwest. It may blow for nine days at a stretch, often at high velocities, and by a Bernoulli effect, it accelerates through the relatively narrow slit between the building and the ground. This wind is so strong that children have been knocked against the rough concrete pillars, and the glass doors jerked open and banged shut.

These practical difficulties could be overcome by installing handrails like life lines on a boat and by fitting mechanical operators on the doors, assuming the pilotis were really necessary. But the fact is they are not. The area under the building is used without for anything more elaborate or differentiated. Their intimate contact with nature still occurs at the beach or in the country, where most own or rent vacation houses, an ingrained French habit. Even Le Corbusier had his little cabana at Cape Martin. (France stands first among nations in the number of “second homes,” the only way, the French feel, to combine privacy and a change of scene.)

C. The Sun.

Sometimes described as the greatest sun worshipper since Ikhnaton, Le Corbusier insisted on its biological and psychic importance. Although the apartments in the Marseilles block are not all equally favored, everyone gets plenty of sun and simple means to control it, except for the public spaces on the third and fourth floors (levels 7 and 8), where the concrete fins hardly cut off the west sun at all, being set SW-NE instead of NW-SE (probably an oversight during construction). In addition to the vertical and horizontal surfaces of the balconies, the apartments are equipped with awnings which can block the sun completely. Their colors join the painted concrete to give a semblance of personal expression to each apartment. It is only a semblance, however, because the colors can never be changed, only repainted. “Le Corbusier” is classified as an historical monument and no alterations of the façades are permitted.

The group of apartments at the south end are by far the most desirable, as would be expected, for they get maximum sun in winter and very little in summer. However, their view is undistinguished and they have no cross-ventilation. The majority of the building to be set true north-south, far from parallel to the street.

Apparently the condominium owners feel no need of anything more elaborate or differentiated. Their intimate contact with nature still occurs at the beach or in the country, where most own or rent vacation houses, an ingrained French habit. Even Le Corbusier had his little cabana at Cape Martin. (France stands first among nations in the number of “second homes,” the only way, the French feel, to combine privacy and a change of scene.)

B. Trees and Greenery.

Very little landscaping has been done except for the excellent grove of plane trees in the parking lot and a rather weak pedestrian walk to the Boulevard Michelet, where the bus shelter is marked “Le Corbusier.” The naturalistic meadow in which the building sits absorbs some of the noise and fumes of the street. With its boundary rows of plane trees, it also plays the role of “ground” in the site plan, permitting the “figure” of the materials of city planning are the sun, the sky, the trees, steel and concrete,” said Le Corbusier, adding “hotel service,” the “corridor street” and the “absolutely private dwelling.”
the apartments, along the long east and west façades, benefit from cross-ventilation and views, but do not have the best insulation. This is a good example of the principle that it is impossible to optimize all of a group of variables each of which has different criteria.

**D. The Sky.**

All apartments in the building see the sky, but in this respect they are not superior to the majority of apartments built in France (and elsewhere) during the past 20 years, i.e., since Corbo showed the way. Like sunshine, a view of the sky is now accepted as a legal right for all dwellings, a not insignificant achievement of the rationalism of “modern architecture.”

The superior use Le Corbusier made of the roof is shown in the Marseilles block. Not only are the ventilation and mechanical requirements combined into interesting forms which make other roofs look like cemeteries, but all group activities involving the outdoors—nursery school, swimming pool, gymnasium, stage, running track—are placed here under the sky (photo). A six-foot-high parapet forces the eye to look upward, a device he repeated at La Tourette. A sociologist could say again that the isolation of the group from the city is only reinforced by this location. However, the gym club has members from other parts of the city and the nursery school a few children who are “outsiders.”

**E. Hotel Service.**

In “The Radiant City” (published 1935) Le Corbusier wrote: “The keystone of the whole organization (of each unité) is the assignment of an entire floor to services.” In this way he hoped to free the individual, especially the housewife, from the multitude of time-wasting chores. He indicated the service floor at the first level above the ground, a preferable location because the stores could also attract buyers from outside the building. But at Marseilles he moved the service floor to mid-height, a more logical place for the convenience of the inhabitants, but a near disaster for the store owners. It is a mistake to link stores too tightly to a single group of consumers. Even if the group or neighborhood initially chosen is large enough to correspond economically with a group of specific services, systems of distribution change, in turn establishing new ratios of people to stores. Stores should be located and planned to adapt to such developments, in accordance with the principle that a constant cannot correspond to a variable. As things are in the Unité at Marseilles, a small chainstore supermarket manages to survive (photo), as do a butcher, hairdresser, dry cleaner, and hardware store. The hotel has about ten rooms, a bar, and a restaurant, which does a good business, including take-out meals. Many of the spaces originally assigned to shops are rented as professional offices. Although the two-story-high shopping street on the west façade is sadly empty (photo), the interior corridors next to the market and the hotel have their lively moments with gossiping men and women padding about in slippers and housecoats. The atmosphere is that of a big family, re-creating some of the spirit of the old, established quarters of the city.

If he had removed the shopping center from its central position (as he did in some of his four later unités) Le Corbusier would have deprived himself of an important plastic and sculptural element. The long horizontal bands of double height louvers are very important in subdividing both east and west façades. But this aesthetic consideration should not have outweighed the practical shortcomings. As with the pirois, a different solution could have been found. The reproach must be made that the economic problems were not realistically studied during the planning stages.

**F. The Corridor-Street.**

Le Corbusier did not anticipate the current preoccupation with promoting social contacts in public spaces. An elevator is a peculiar device for crowding people together and as yet its architectural possibilities have not been explored. The elevators in the Marseilles block are no exception. They are convenient in being wider than deep, but offer no other amenities. They work more or less well. The “expert elevator operators” predicted by Le Corbusier are often electronic though there is always one human one in the daytime. Because of the interlocking duplex apartments, the elevators stop at only every third level, which makes you feel it is a short trip and not such a high building.

From the elevator you walk down the dark corridor. The lights at each of the painted doorways — green, yellow, red, blue — complete the intended effect of row houses lining a Mediterranean village street on a moonless night. While some people do not like it, I find it sympathetic. At least it is not bland. Except for possible muggings, which so far have not occurred, there is no functional reason against the relative darkness. The contrast is all the more dramatic when an apartment door is opened and you enter a space vibrating with light and sunshine.

**G. The Private Dwelling.**

The acoustical barrier is almost as strong as the luminous contrast. As you walk alone down the corridor-street, you hear only the echo of your own footsteps. Once inside the apartment, children can scream, loud-speakers can blast, dogs can bark — yet no one outside will hear. Le Corbusier wanted the “silence of a tomb” in his apartments and he achieved it. The technical clue is the famous “cage and box” structure, which has been shown so often in model form. In reality the apartments were not prefabricated boxes. They were constructed in place of cold-formed steel elements supported on lead pads set on an open framework of reinforced concrete beams and columns. As a system for acoustical privacy, it works perfectly, yet nobody copies it. The excuse is that it is too costly, that it was possible only because the government paid the bill (now repaid many times over by the sale of the apartments and by subsequent inflation). However, industry has shown great ability to reduce the cost of a system if there is a real demand. What is important is to agree on the objective.

It is impossible to over-emphasize...
EVERY THIRD FLOOR IS A CONCRETE SLAB, ISOLATING 2 APARTMENTS VERTICALLY FOR FIRE PROTECTION. WOOD FLOORS ARE INSTALLED OVER LEAD STRIPS ON WOOD SLEEPERS FOR PANEL CONSTRUCTION OTHERWISE SAME AS SHOWN. ALL WOOD IS FIREPROOFED.

EVERY BAY IS ISOLATED FOR FIRE PROTECTION BY A GYPSUM BLOCK PARTITION.

THE CORRIDORS HAVE CONCRETE SLAB FLOOR AND CEILINGS, CONCRETE PANEL WALLS.

THE SUSPENDED FLOORS (INTERMEDIATE LEVELS) CONSTRUCTED AS SHOWN.

THE PARTITIONS ARE OF FIREPROOFED WOOD FRAMES, SURFACED WITH GYPSUM BOARD, WITH GLASS WOOL BLANKETS IN BACK.

THE CEILINGS ARE SIMILAR TO THE PARTITIONS; LEAD PADS BLOCK CEILING JOISTS AGAINST CONCRETE BEAMS.

Unite d'Habitation
Marseilles, France
Le Corbusier, Architect

Selected Details
Typical Framing of Apartment
Corbu: “All my commentators talk about my city of the future. It is useless to answer that I know only the present; I cannot make any claims about the future.”

They reply is a cowardly trick: ‘You are busy with the future’, implying that they and everybody else are taking care of the present. What a lie! With all the modesty of a researcher, I am devoted to the present, today; as for them, they live yesterday, in yesterday’s terms” (The Radiant City). In this he was right.

Where he was wrong was in thinking that he could almost single-handedly establish a complete architecture program for the present. Here, in the program stage, is the moment when sociologists, historians, geographers, economists, ecologists and the public must intervene. The public, society as a whole, is now the client and must be trained, from school days on, to criticize, to judge, to define the environment it wants.

Le Corbusier let his prejudices override evidence in insisting on the absolute superiority of high-density multistory housing over the single family house and garden. His drawing comparing a graph-paper suburban layout with his Unité d’Habitation was grossly unfair. Most multistory apartment houses are nothing more than the same graph-paper set vertically. The formal chaos everyone deprecates in suburbia has merely been repeated on a colossal scale. He himself did not believe in an automatic and unthinking application of the Radiant City principle. He anticipated some of its defects when he wrote: “The vast spaces which I created in this imaginary city, dominated by an ever-present sky, tortured my mind; I was afraid that they might be ‘dead’ and that the people who lived there might be bored or even frightened.”

But every time he was given the chance to work with a real site, his proposals were richer and more varied than any formula, as can be seen by studying the plans he made for a much larger area of Marseilles (Le Corbusier, Oeuvre complete, 1946-52, Boesiger, Zurich 1983).

The tragedy of Marseilles is that the city did not take advantage of the architectural talent which Le Corbusier offered. It is only by imagining its growth as architecture — in terms of three-dimensional form — that a city plan can become great. For 2600 years Marseilles has planned from day to day, with only

The importance of acoustical privacy. After studying Nantes-Rezé, the second Unité built by Le Corbusier after Marseilles, Chombart de Lauwe, the sociologist, stated “The entire social life of the apartment house was transformed as a result of the perfect acoustical privacy.” Most of the apartments are designed on two levels, providing the potential for rich spatial effects within. It remains largely potential, however, because there are only two main variations. In one, you enter at the kitchen-dining-living room level and go up to the bedrooms, in the other you enter at a kitchen-dining balcony and go down to the living room and bedrooms.

It is surprising to learn that a number of architect-owners have extended their balcony floors out to the exterior wall, drastically cramping the third dimension to which you would think them particularly sensitive. Since the façades cannot be touched, however, there can be no massive destruction of Le Corbusier’s architecture such as occurred in the Frugès project at Pessac-Bordeaux (1925), a destruction Le Corbusier shrugged off by saying “Life always has the last word.”

On the other hand, in spite of Charlotte Perriand’s pioneering built-in furniture and the carefully determined minimum room sizes, I wonder if the apartments could not have been designed to permit their rebuilding according to the whims and desires of their owners. One of the irrefutable arguments in favor of single family houses is that they can so easily be enlarged or remodeled. In France the major housing efforts since the war have been directed toward apartment projects. Not only are they often bleak and isolated from older sections of the city, but the tenants can do nothing to make their apartments their own.

French sociologists have made a significant contribution to environmental studies by their analyses of mass housing. Although they have not specifically studied the Marseilles block, whose inhabitants generally have the means to express themselves with their furniture, the conclusions of the sociologists are equally valid here and can be a guide for all architects. Paul Chombart de Lauwe (Famille et Habitation, C.N.R.S., Paris, 1960) states: “Modern architecture has been explained as anticipating human needs. Tomorrow’s needs can be partly provided for by studying today’s desires ... The most profound desires of man are those which help liberate him.”

And H. Lefebvre writes (preface to L’habitat pavillonnaire, C.R.U. 1966): “Let nobody claim the right to determine the destiny of society by fixing the housing standards and the way of living for all its members. Invention and discovery must remain possible. The dwelling is a free area. In the home, which is preferable above all others, a man should be able to assert himself and act out successive roles: craftsman, thinker, creator, lover, comedian, etc.”

The next step in apartment house design should be an empty space, say 12,000 cu ft, which the owner could subdivide according to his own plans, somewhat as a business can subdivide an office floor. The idea is widespread, but so far no one has made it a reality. If only Le Corbusier had been able to profit from imaginative sociological studies instead of depending so much on his own intuition!

II Le Corbusier the “visionary”; a double tragedy.

The tragedy of Le Corbusier was public misunderstanding, a situation his own character encouraged. What he might have accepted as objective criticism he often interpreted as an attack on his personal integrity. Like de Gaulle, whom he resembled in his fanaticness, he never forgot a grudge.

Unfortunately his critics were often not objective, and he saw through their shortsightedness as in his famous blast: “All my commentators talk about my ‘city of the future’. It is useless to answer that I only know the present; I cannot make any claims about the future.

1Thoroughly analyzed in the book Pessac de Le Corbusier by Philippe Boudon, Dunod (Paris) 1969. The “last word” in this case may hopefully be their classification as a historical monument and their complete restoration.
occasional architectural successes. Le Corbusier offered it much more.

III The Real Contribution.

Le Corbusier succeeded as an architect, not only because he understood the necessity of analyzing his program thoroughly, but because he knew how to create a building which does much more than answer a problem. "The house is a machine to live in," he wrote in 1923, but also in the same text: "My house is practical. I say, thanks a lot, the way I'd say thanks to the railroad engineers or the telephone company. You haven't touched my heart. But, if its walls stand silhouetted against the sky in a form which excites me, I feel your intentions. You were gentle, brutal, charming or dignified. The stones say so. My eyes see something which tells of a thought—a thought which is explained not by words or by sounds, but only by pure forms which are interrelated. . . . With crude materials, with a more or less practical program which you have transcended, you have established relationships which excite me. That is architecture!"

How did he do this in Marseilles? Perhaps the durable aesthetic concept of "unity in diversity" will help us to understand. The unity of the Marseilles block is obvious, but the richness of its diversity is limitless. Its mass is almost classical in its tripartite division, but the treatment is unexpected. Le Corbusier had "a horror of conventionality." The base is a void, an unbase. The cornice is the parapet and the group of forms on the roof. The wall is often ambiguous. Like contrast and dissonance, ambiguity is an aspect of diversity as characteristic of our time as it was of the Baroque. Although Le Corbusier's paintings show his preoccupation with ambiguous shapes as he assimilated the plastic lessons of Ozenfant, Braque, Léger and Picasso, it is in architectural form that he made an original contribution. One of the ways this is shown in the Marseilles block, for example, is by the division of the façade (see p. 92) into two triplets below and three triplets above the two shopping streets. The apparent height is reduced to perhaps 7 stories, at the most 12, instead of 17 which are actually there and which can, of course, be found by careful counting. How this is felt as you move through the building I have already mentioned in the section on the "Corridor-Street."

You are also very conscious of another optical illusion looking up from the parking lot toward the northwest corner. Above the pilotis, the wall is divided into two unequal parts by the horizontal band of louvers which mask the two shopping floors. The balconies of the apartments above and below the division are actually in one plane, but it is impossible to "read" them so. The lower block appears out in front of the upper. I do not suggest that these ambiguities are major aspects of the richness of Le Corbusier's design, nor that they were all intended, but merely that they are characteristic of his handling of forms.

A careful study of the façades, even in photographs, reveals many types of nonambiguous variety. The grid, a planning and structural necessity, gives unity, but every functional difference is taken advantage of to break it: balcony parapets, horizontal sunshades, the shopping street, and an occasional apartment which is out of step with the others. The east and west façades differ not only by the elevator tower but also in their horizontal patterns because the east apartments overlap those on the west. Everywhere Le Corbusier expresses functional as well as plastic
The two-story shopping street on the west façade is usually quite empty (left) but the supermarket branch (left, below) survives. Space under the building does not seem to appeal to children as the roof playground does (below) Photos: L. Sciarli.

relationships, in accordance with his principle “A building is like a soap bubble. The exterior is the result of the interior.” But he does so without the boredom of typical one-to-one relationships. The only important functions he failed to express are two interior stair towers on the east façade; they were given windows like apartments and you’d never notice them except at night.

The coherence of the design is partly due to the Modulor. All dimensions are interrelated, like notes on a well tuned piano. More than any architect since the Renaissance, Le Corbusier was preoccupied with geometrical proportions. Obviously the Modulor does not correspond exactly to the human figure, but the attitude which invented it is nothing if not architectural.

Like any other work of art, a great building is an inexhaustible source of psychic energy. It cannot be created by machines and a machine is not art. Le Corbusier succeeded because he knew that “There are no rules in art, there is only success or failure measured by the solution proposed to a conflict of ideas, emotions, practical requirements. . . . A work of art is the ultimate result of an incredible, inconceivable, indescribable mental struggle.” And the result is human. After almost 20 years, those who live in the building—many since the beginning— feel toward it the way a long-married partner would, who has accepted another’s defects and idiosyncracies but whose love and admiration are strengthened by the day-to-day experience of living together.

Living with Corbu 97
For a bright backdrop to a Brooklyn playground at the end of dreary row houses, artist Tania painted a sunny yellow and a crisp sky blue around a focal metal sculpture.
Billboard techniques fostered by city agencies are producing superscale urban frescoes — both abstract and social.

Journalistically, regular readers may be able to stand only one more word on the subject of Supergraphics — its epitaph. Especially so since one of the major paint companies last year published its knell as a how-to-paint-stripes-and-circles brochure that apparently presented the device as an interiors fad for plasticamerica.

Urbanistically, however, the potential of paint for quick, economical, and community-involved urban renewal is only just being proclaimed to a meaningful degree. Two forces are making this proclamation: first, the architects and designers whose interests in Supergraphics seem still to be expanding, and second, the outdoor mural-painting programs of municipal governments in depressed areas of New York City, Detroit, Chicago, Boston and elsewhere. Television stations from West Germany and Italy recently visited Boston to produce films on this ghetto mural activity because they reportedly consider it one of the most stimulating social and artistic phenomena in our country today.

As a fast and cheap means of enlivening our ghettos, our industrial areas and our too often drab city environments, paint can make an immediate contribution. Today's cities can be bright, cheerful and sprightly without being completely rebuilt.

The reasons for using paint for this purpose are several: economics, remedial improvement, involvement of both users and designers, and finally, aesthetic possibilities. Several architects and designers who have employed these devices (and whose works have been previously pub-
lished in P/A) provide detailed reasoning on these points and give tips on the technology of Supergraphics:

**Economics**

“The beauty of it is that it is a very low-cost answer,” says architect Cesar Pelli. “Architects who used to be concerned only with so-called important projects are concerned today with low-cost problems as well — problems where there is little money. And paint is a terribly important answer.”

Architect Hugh Hardy adds a note of caution. “Talking about the device as being cheap for the ghetto sounds second best — like cleaning up the natives. It sounds condescending. Why should ghetto solutions be low cost? This sounds less appealing than that the technique is good because it is a good idea.”

Cesar Pelli replies, “Sometimes you have to do things with little money because the money has to go far and there is just so much to go around. And maybe you should stretch it and do more with that money. Besides, the technique is not only good for ghettos; as our Jewelry Mart shows (P/A, Dec. 1968), it can enliven a commercial problem.”

In addition, the low cost of a paint-design solution engenders rapport between clients and their architects. As architect Barry Feiss explains, “Clients are less hesitant about trusting you with paint because it does not take a lot of bread out of their pockets.”

But are Supergraphic exteriors really inexpensive? One contractor answers, “Why should it be expensive? Painting is painting.” Obviously the costs of execution are inextricably bound up with the labor force engaged. “Many sign painters get $125 per day,” Barbara Stauffacher Solomon observes. Student-designer-architects who execute their own designs are clearly less expensive than union painters. Designer Peter Harrison of Robert Miles Runyon & Associates admits that the two sunbursts for the S.S. Independence (P/A Dec. 1968) cost $38,000, but they were 400’ x 150’ crossing over many levels.

The Supergraphic design that architects Hardy Holzmann Pfeiffer had painted on the exterior of the Brooklyn Children’s Museum “Muse” (P/A Dec. 1968) cost $300 including the spider scaffolding. “And I cannot think of anything that would have been as inexpensive,” Hardy adds.

In New York City the Department of Cultural Affairs’ City Walls program sponsors murals that cost between $1500 and $5000. The total cost of one project, according to Albany, New York, architect Harris A. Sanders, was “about one-third more expensive as compared to merely painting the project without any graphics, or 18 cents per sq ft compared to 12 cents per sq ft.”

“If you design something complicated it takes a long time,” Barbara Stauffacher Solomon explains, “and if you design something easy it is quick as hell.”

**Painters**

So far, exterior and interior Supergraphics have been painted by students, designers, architects, sign-board painters, union and nonunion house painters and special category painters.

Toronto’s Barrie Briscoe (P/A Sept. 1969) and California’s Barbara Solomon each keep one sign painter busy. Hardy Holzmann Pfeiffer worked with a billboard painter on Muse. “He grumbled because of the diagonal lettering that runs across glass, stone and metal,” Hardy remembers. “He was not used to it. Sign painters spend their whole trade lining things up horizontally.”

“Yet billboard painting has been going out of fashion for the last 10
Of the bucolic painted roadside fence, which shields the truck lot and building at Farmer John meat packing plant in Vernon, California, David Gebhard, director of The Art Galleries at the University of California, Santa Barbara, writes observantly: "The uniqueness of the approach to design (and public relations) is so way out and flamboyant that there are many lessons we can learn from it. Here is a real application of the idea of Supergraphics or whathaveyou — combining a 19th century view of the farm with the billboard; with illusionism tempered by an understanding of community relations. Here behind these nostalgic reminiscences of the farm, slaughter takes place and stench permeates the air."

A red stripe oozes from under a sidewalk manhole cover, crosses the sidewalk and winds over the entry to direct circulation to the door handle of the Birmingham, Ala., shop "Fraction." The shop was designed by Tulane architecture graduate Gray Plosser Jr., now a 1st Lt in the Army Engineers in Germany.

Circulation graphics and entry door become the eye-catching commercial signage of the building as well as a bright spot in the urban shopping environment — for under $150. Freehand painting "and a lot of touching up" over the rough old building included one sealer coat and two coats of gloss enamel. Though the regular enamel has lasted on the sidewalk, a more durable paint should be investigated, the designer urges.

Involved students of urban design at St. Louis' Washington University initiated a playground mural in University City, Mo., by approaching the Land Clearance for Redevelopment Authority over two and a half years ago. The mural is still intact. City authorities saw the mural as an effort to dress up redevelopment areas between the time of demolition and new construction.

While designers William Albinson and Robert Kearney Jr. projected slides of their design model on the walls at night, freehanded outlines in crayon, University City Police tried several times to arrest them. The two nights of cartooning included incorporating projected shadows of the designers. With the help of neighborhood children ("literally a cast of hundreds — children, dogs, etc.") the designers finished the scheme in a week. The Redevelopment Authority provided brushes, 17 gallons of paint, and turpentine along with pizzas and hamburgers for labor. Total cost was about $300 for about 2000 sq ft, or 15 cents per sq ft. "I would classify this as inexpensive," says architect Kearney, "but if you had to pay the labor it would be another question."
years," Barrie Briscoe observes, “and big outdoor sign painters have decreased in number. But it is good to work with sign painters,” he says, “because they are accustomed to blowing designs up in scale.”

“A problem with union painters,” according to Austin architect Richard Oliver, “is that some of them want to know the whole lay of the land before they start. With non-union painters we just say do this today and then do that tomorrow.”

Other Reasons

“It is a remedial operation,” says architect Lee Harris Pomeroy, “in that it corrects bad spaces.” In answer to the question of whether architects could become content with being exterior decorators, Barry Feiss, now an associate of Pomeroy’s adds, “If he takes care of a bad situation he is doing a good job. We are in a situation where a lot of things have got to get done and this is a quick, simple way of doing them. You can improve the quality of the environment with graphics. America is packaging oriented, and if you give people that, they think it is done completely anyway. People have to be happy again before they will do anything about our environment."

“A primary value,” Lee Pomeroy continues, “is that overworked word ‘involvement.’ With paint, the community itself can get into it. They can’t build buildings and lay bricks, but they can paint. That has a real social value.” In Puerto Rico a year or so ago, church members painted their own Supergraphic exterior; architect Barry Feiss numbered the building design in chalk and gave each church member-painter a number and a paint pail, explaining, “You are color number one and you are color number four.” The action melded the congregation.

This same spirit has spurred the painting of murals in black ghettos in Detroit, Chicago, and Boston, where the Institute for Contemporary Art has been a leading force. In New York this spring, a mural sponsored by the City’s Department of Cultural Affairs was painted by black teenage artists; the Al Smith Housing project. They painted the saga of a black power figure turning his back on drugs.

“If Government is going to get into the arts,” says former NYC Director of Cultural Affairs Doris Freedman, “it has a dual responsibility: one to the artist, the other to all the people.”

Aesthetic considerations in Supergraphics, of course, continue to interest designers and architects. Doris Freedman observes, “Artists are now working in a scale that cannot be contained in an institution and so art has to come outdoors.”

Architect Hugh Hardy adds, “Most of these murals are still frame oriented, however, and there is no reason they could not take that at a bigger scale and spread the idea across lots of buildings. In a sense Times Square is that because it all goes around corners in neon. If you can take a three-dimensional solid and dematerialize its corner, that is a pretty potent vocabulary. The fact that it costs very little is only one part. You could do it all with chrome and lapis lazuli and it would be vastly expensive. But it would still do the same job and be the same powerful core thought.”

Cesar Pelli sums up the aesthetic considerations. “Supergraphics is a minor thing, but it is a new possibility that has been incorporated into architecture. It is a widening of the range of what architecture is. Paint used to be something outside the pale. And this is a breaking away from that — that colors in themselves can become architecture. It is one more tool. It is not the answer to everything but in many cases it is the best answer.”

Technology: Designs

The working drawings that are provided for Supergraphic designs are of several types: scale elevations, axiomatic plans, color-coded elevations by numbered paint chips and colored-in scale drawings. Barrie Briscoe makes ½ in. scale drawings for wherever there are special areas.

Scale models have also been prepared — sometimes of exterior designs but primarily of interior projects. In the main, residential interior designs have been executed from no drawings or quick sketches at most.

Preparation of Surfaces

Ordinary cleaning of outdoor surfaces is the rule, but one renewal project was executed without cleaning. Another engaged the community for a whole week of scrubbing down and brushing its building.

Primer coats commonly used include oil for concrete blocks, latex for wood shingles. Brick, “which soaks up gallons of paint” one designer reminds us, should be coated with a sealer before the prime coat. Toronto architect A.J. Diamond adds that new brick should be allowed time to lose its salts before being painted. The standard four-step process for masonry walls outlined by paint companies is recommended by architect Robert Kearney Jr. That process is: one primer coat, two finish coats of enamel, and a top coat of glazing to prevent efflorescence.

Transferring Designs

The methods of transferring the design to the prepared surface have ranged from the simplest freehand drawing measured by eye in interior work to the most elaborate combination worked out for the S.S. Independence. There one man on a dock with a surveyor’s transit communicated by walkie-talkie with a crane-supported painter who made guide point marks on the ship.

“So that you will not have to go through a whole number measuring up a building,” Barry Feiss points out, “you can design the job to use features of the building such as doors and windows as guide points.”

Stripes are most commonly laid
In Areicibo, Puerto Rico, New York architect Barry Feiss, who was then with the architectural firm of Schimmelpennig, Ruiz & Gonzales Inc., designed a paint-renovation scheme for an old lumber warehouse that was to be refurbished as a bottling plant for Ron Llave rum. The design was a real happening: at the site, in one hour architect Feiss conceived and drew a sketch, which he showed to the painting contractors. "Draw circles the height of the building," he instructed, "then repeat them around the building until you get back to the start." It was done a week later at the cost of $2000.

Architect Feiss conceived the scheme as a direct expression of the interior function of the bottling plant — its repetitive barrels and bottles. He also saw the scheme as relating to the cityscape of Areicibo — the white-beige tint matching sidewalks and house trim, the reddish tint matching rooftops — yet as also creating a new scale with a simple geometric form.

The design, aesthetically, does have a Supergraphic dimension (architect Feiss calls them "Metagraphics" for their metaphorical allusiveness) in that it has a literary meaning beyond large size. The circles in Feiss's mind are like Batman's spotlight being projected on the building. Its powerful beam blots out the red and makes beige circles; in the process the beam catches hanging lamp fixtures in its shadow. This two-level allusion is the heart of Supergraphics.

For the Slay Bulk Terminal on the west bank of the Mississippi River at St. Louis, architects Hohmann & Meyer designed and executed a paint-stripe scheme as a "low-cost beautification and aesthetic improvement" in addition to their master-plan for the Terminal. Scale elevations were prepared, as well as larger scale details of radii. First the two 30-ft diameter, 40-ft high tanks were sprayed yellow all over with an amine-cured epoxy primer and a chemically cured epoxy enamel finish. Transfer of the design's horizontal lines onto the tanks was accomplished, according to architect George H. Hohmann, "by using a storey pole, transit, and chalk line; vertical lines were plumbed and chalked on; curves were freehanded onto the tanks." Then, 12-in. masking tape was used to outline the stripes that were subsequently sprayed a second color.

The job took six union man-days per 46,000 sq ft tank. The bid price per tank was a normal $3000; it cost $400 more per tank to paint the stripes. The owners of Slay Bulk Terminal agree with the architects that the project has become a favorable public relations effort and "an artform as well as a tank farm." They therefore plan to paint four more tanks this year.
The Housing Evaluation Center at Austin, Tex., was a five-month data-gathering project of HUD and the University of Texas at Austin. In the Center, the ten preselected system houses used in the low-income development "Austin Oaks" were evaluated for acceptability by the occupants, whose preferences and needs by ethnic group were also determined. The Center was housed in a vacant tire sales and service building, which was carefully selected to be within the overlapping territory of the Black, Chicano, and Anglo populations. Trained interviewers from each group held three-hour sessions with families at the Center—in the conference area, in the children's domain, and in a "game room."

"The graphic handling of the building," according to architect Richard Oliver who designed the graphics, "made a temporary landmark of a forgotten building in an unmemorable section of town. Street façades were treated in polite regional colors but at outrageous size. Back under the canopy, colors boiled out bright and hard. A giant red and blue nonflag gave a vaguely Federal air, while certain composite Spanish-English words provided evidence that the place was prepared by locals for locals.

It was equally off-balancing to everybody—both a pleasant surprise to interviewed families and to curious and approving middle-class drop-in visitors. As intended, it was impossible for anybody to find a stereotype by which to peg the Center." Nonunion Mexican housepainters working with full-size templates taped to the walls painted the exterior signs and the interior work, aided by three union sign painters who did the small graphics. Total cost for painting including the two exterior sides (70 ft long and 150 ft long) was $1500.

The world's largest representational Supergraphics may well be the abstractions that have slyly amused motorists for the past three years near New York and Chicago: A three-dimensional, sculptural, 50-ft-long tiger tail constructed of painted steel wags out of the Humble Oil Terminal in Chicago. A painted, two-dimensional version is visible at Humble's Bayway Refinery going North on the New Jersey Turnpike between exits 12 and 13. This example of the merger of commercial art and literary amusement is pioneering in our culture.

Guidelines

How to ensure a hard edge for the painted design is an important ques-
The "1–2–2 Club," a neighborhood youth center at 122 Franklin Street in an economically depressed area of Albany, N.Y., has revitalized several abandoned buildings with a large scale exterior paint scheme based on the address. Designed by Steven L. Einhorn, Merrill H. Diamond, and Eric C. Yaffee of the architectural firm Einhorn-Sanders Associates, the building was refurbished with no effort to repair the broken shingles or cracked blocks. Instead, circles and segments were laid out on the old surfaces by using varying lengths of wood poles with one end drilled to hold a marker and the other end nailed to the wall. Then sign painters and house painters completed the finish free hand.

The project has survived the longest and most severe winter in Albany’s history. It cost about a third more than painting the surface without graphics, but at 18 cents per sq ft as compared with 12 cents per sq ft that is still urban revitalization at low cost.
tion. Masking tape versus freehand seems to be the basic choice. "For close scale where the edge counts," Richard Oliver observes, "we use masking tape; at a bigger scale, freehand is adequate."

Freehand and care seem to go together. "The guy I use makes straight lines as he goes," says Barbara Solomon. "A good sign painter can do that."

"Sign painters use big brushes that hold more paint," Barrie Briscoe elaborates, "since the freer the stroke the more even the stripe."

Paint Materials
Most designers seem to specify just good outdoor enamel — regular house paint over a primer. "I leave that up to the paint company," says Barbara Solomon. Others have preferences about specific brands.

"Sign painters use a very high quality paint and do it in one coat so they will not have to do it over," Barrie Briscoe notes.

At Houston's Project HOPE, gloss paint was applied over flat black backgrounds. The Austin Housing Evaluation Center had latex flat paint outside; inside, high and semi-gloss enamel were used over an enamel undercoat because they were washable. Hardy Holmann Pfeiffer are also intrigued by the use of shiny and matte surfaces together. For floors and some vertical exterior work, epoxy paints seem to be the recommended area of investigation.

Problems and Hints
Architects Murphy Levy Wurman point out that painted designs "take more supervision from critical point to critical point." Richard Oliver agrees, "You have to keep checking because the workmen are unfamiliar with the idea. You have to keep breaking the information down into pieces they can understand and go back every day and snap out a new bunch of lines." Admittedly Oliver is speaking of a project done with unskilled house painters rather than sign painters.

"Most mistakes are judgment about scale," Barbara Solomon advises. "That is all about the eye of the creator — where you do it and where you don't do it. That is the design."

Lee Pomeroy has one hint about the masking tape procedure in a multiple color stripe scheme. "To prevent laying out the tape twice for each side of a hard edge," he explains, "lay out 14 in. masking tape to create a narrow white stripe between two colors. Our painters put a coat of clear nail polish over the single surface opaque black vinyl masking tape, then painted a different color on each side. When the single piece of tape was removed, the paints had not run under the tape because of the clear lacquer and that lacquer left a hard edge. The white stripe between the two colors also gives them additional brightness."

Duration of painted designs is variable, but the consensus is that a multicolor exterior paint scheme lasts as long as a whole house surface or any other outdoor paint. Interior stripes last no less well than a whole wall of one-color paint. Most outdoor murals have lasted intact for at least two and a half years.

Some Admonitions
Final words on the subject are admonitions from two designers. Barbara Solomon warns, "Supergraphics has been used very faddishly by many people so far. It is better when there is a reason for it — when it can be used directionally or even when it is subliminally decorative — rather than being purely decorative."

Lee Harris Pomeroy concludes, "Our streets mean nothing to people as a place. They are conduits for garbage, as they were for the Romans. To make people care about the streets they have to have symbolism and sex appeal — like tail fins. Supergraphics exteriors are a short-term strategy to give sex appeal to our environment."

Let us make no mistake about the intentions of this report. Paint is not a panacea. It is only icing on a desert. It will not feed the poor or nourish them, but it can make them feel better temporarily. Paint may not make squallor be better, but it can make it look better. It can give some visual relief. Admittedly, in this kind of environmental renewal we are dealing with symptoms rather than causes, with "bandaids rather than surgery" as one spokesman said of another activity at this year's AIA convention. But let us not make a mistake in the direction of real priorities either: we must deal with interim measures until a vaccine is discovered. There is a valid place for surface renewal as well as fundamental renewal. May we use paint wisely for urban revitalization. — CRS

Project HOPE, a youth recreation center in Houston's Black "Pearl Harbor" area, is one of those achievements that the world of architecture can be proud of. It was designed and built by fourth year architecture students at the University of Houston as a class project. The tyro-architects not only devoted themselves to a problem that was relevant to today's society, they also went beyond that dedication to produce a real accomplishment — beyond the lip service of protest that so many students exercise without further results. In addition, the Houston students gained on-the-job training about client relations, about persuasiveness in obtaining contributed materials from local suppliers, and about actual construction — instead of the elaborate yet detached paperwork of too many architecture students.

In setting up their own course program at the direction of associate professor John Zemanek, the fourth year students contacted HOPE — Human Organization for Political and Economic Development — which had selected a site for a youth center in Houston's most depressed ghetto. The site was a dilapidated wedge-shaped one-story building that HOPE had painted black and named the Black Building; it had an adjoining open area which was asphalted.

According to architect Zemanek, "The meeting with HOPE brought out how times have changed — HOPE was not impressed with advice and promises with strings attached, with problem solutions that created new problems. Unless HOPE could help us," professor Zemanek continues, "they were not interested in our intentions to help them. We needed help; we knew we had gone to the right place. With the understanding that HOPE was providing an opportunity to design and build a useful community facility, not only for the ghetto but also useful as a learning experience in the urban environment, we embarked on what was an experiment in architectural education. The students learned about sociology, economics, psychology and all those environmental students as well as about frustration, patience, fear, work and each other."

Materials for construction were donated by business establishments; except for small purchases, no cash funds were required throughout the project. Painting included exterior logos and signs (the lightning pattern on the front was freehanded by Charles Coffman from a comic book) as well as interior designs (some were photos of neighborhood kids projected then painted on the walls). The total involvement of architecture students with the neighborhood was a project in which all architects should see great hope — and the potential contribution of paint to our urban environments.
Golden Vari-Tran® reflective glass makes its debut in Dallas.

This is Lemmon Park Central, the office building designed by Dallas Architects Woodward, Cape & Partners, Inc. Vari-Tran/Golden gave them a beautiful new way to achieve aesthetic effects, while effectively controlling solar radiation and significantly reducing cost of cooling equipment and annual operating expense for owners Southwestern Dynamics, Inc.

Window walls are Thermopane® insulating glass with a golden Vari-Tran coating. Spandrels are Tuf-flex® tempered glass, also Vari-Tran coated. So the building's facades read as one material. Reflections on its glass surfaces change and shift with light conditions. And the surrounding environment becomes a part of its architectural expression.

Get the data on L-O-F products with silvery and golden Vari-Tran coatings in six variable heat and light transmittances. Write Architectural Construction Department, Libbey-Owens-Ford Company, Toledo, Ohio 43624.
Who hid the hardware?

Bobrick did in their New Flush Front Toilet Compartments

Bobrick, design leader in washroom equipment for 64 years, now offers you a complete line of Laminated Plastic Toilet Compartments with unique design features.

An attractive flush front appearance is created by uniform 1" thickness of doors, pilasters, wall posts and panels. Pilasters and wall posts have 11 gauge steel reinforced cores. Stainless steel hardware is aesthetically concealed inside the compartments. No hardware exposed on the exterior.

Bobrick’s new Toilet Compartments are available with pre-cut partition openings for recessing Bobrick stainless steel dispensers and disposal units — save equipment and installation costs.

Offered in two series: Stainless Steel Edged and Laminated Plastic Edged. Matching Urinal and Entrance Screens and Lavatory Vanity Tops also available.

Send for special 8 page catalog, TP-7007, to Bobrick: Brooklyn, New York 11210 or Los Angeles, California 90039. Representatives in all major cities in the United States, Canada and overseas.

Since 1906 Designers and Manufacturers of Washroom Equipment.

On Reader Service Card, Circle No. 333
Materials Handling for Hospitals

This is the first of a series of articles discussing the problem of materials distribution in hospitals and related facilities. Available systems and equipment are outlined by an associate of Syska & Hennessy, Inc., Consulting Engineers, New York City.

Simply stated, planners and administrators of hospitals and medical teaching facilities are faced with the supply and return of hundreds, and in many cases thousands, of items each day. These materials run the gamut in size, shape and durability. The trick is to distribute them to and from the user as cheaply as possible by dependable means.

Unfortunately, there is no pat answer, no one system that meets all conditions. Outlined here, on a broad basis, are the available systems and equipment. There are three major categories of materials distribution. The first is manual transportation.

Types of Materials
A list of the types of materials to be moved would be too extensive to include here. But the major large and accumulated items that can be moved by carts are food, clean and soiled linens, patient treatment equipment, solutions, lab samples, housekeeping supplies, solid wastes, flowers, pharmaceuticals and bulk supplies of medical records, X-rays and paper forms.

Some of the small items that require individual handling range from a sample for testing sent between the operating room and the lab to such items as requisition forms, mail, a medical record, an X-ray, a completed pharmacy prescription.

Quantities
Although quantities of movable materials vary widely between institutions, the scope of materials traffic can be visualized by using a 600-bed hospital as an example. This facility might generate 600 cart trips per day, or 300 each way, of which close to 200 may be for food service. Thirty to 40 trips may be required during a one-hour food serving period. If the hospital has adjacent teaching and research facilities, these quantities increase.

Transportation of small items in the same hospital can account for 2000 carrier trips per day. Clean and soiled linens will run from 10 to 16 lbs per bed each day, or an average of 8000 lbs each day. Solid wastes, even without a complete disposable program and teaching facilities, can run 10,000 to 15,000 lbs per day.

Types of Equipment
In addition to service elevators and hand carts for manual movement, there are numerous systems available to move carts automatically, both vertically and horizontally. All of them load and unload carts onto carriers automatically for vertical use.

Automatic cart lifts are available for vertical movement only. These are really small elevators or dumbwaiters with equipment built into the floors to injects or ejects carts.

Automatic cart systems for vertical and horizontal travel move carts by means of transporters traveling on monorails or overhead chain conveyors, by chain drives in the floor, or by self-propulsion guided by electric impulse wiring in the floor.

For transportation of small individual items there are pneumatic tube systems, automatic ejection dumbwaiters equipped with trays and tote boxes, horizontal and vertical conveyors that also use tote boxes, and an automated self-propelled container system that travels on a small track.

For departmental materials handling there is an extensive amount of conveyor equipment for automated food service and dishwashing, automated central sterile supply operations, automatic cart washing and X-ray handling.

Gravity chutes, commonly used for soiled linen and solid waste return, in many cases can be converted to a system which pneumatically transports the materials back to central collection areas.

Costs
Cart systems can cost $1000 to $5000 per bed. Systems for small items can cost $7000 to $20,000 per station. Whichever systems are selected, careful study must first be done to insure that they can do the job, and then economic comparisons should be made. Most systems will have to be justified economically in terms of manpower savings. In such a study, costs of space for separate tunnels or corridors and shafts must be included. Costs of maintenance and replacement must not be overlooked. Each case must be evaluated individually since building orientation (i.e. extensive horizontal, minimum vertical travel vs. high vertical, minimum horizontal travel) and outlying facilities have an important bearing on costs.

Planning
It is important that materials handling be examined in the very early stages of planning new hospitals and related facilities. This can save extensive redesign and rebudgeting as plans develop. What exists and is to remain or is to be converted should be included to make the analysis complete. The rising cost of manpower and the growing difficulty of obtaining needed manpower in many geographical areas makes the study of a good materials handling system more important every year. This, then, is one of the challenges that every owner, architect, and engineer encounters in his quest to design not only an attractive facility but an efficient and functional one.
Earthwork Specifications: Part II

This month, the Chief Specifications Writer of Skidmore, Owings & Merrill, New York City, continues his recommendations for earthwork specifications, suggesting provisions to protect the interests of the architect and his client.

When rock is likely to be encountered during excavation, the specifications may provide for an equitable pay arrangement. An estimated quantity of rock may be noted in the specifications with a stipulation that if a greater or lesser amount is encountered, the contract sum would be adjusted accordingly. This provides for firm bidding without any contingencies on the part of the contractor.

Use of the following language is recommended:

"The contract price shall include allowances of____cubic yards of general rock excavation and____cubic yards of trench and pit excavation. The actual total amount of rock to be excavated shall be determined by cross sectioning and measuring the rock to be removed. Should a greater or lesser amount of rock be encountered than the total estimated amounts hereinbefore noted, payment for any such greater amount or credit for any such lesser amount shall be made in accordance with the unit prices agreed upon."

The specifications may also be written to provide that all excavation be considered as earth, and that if rock is encountered, it would be measured and paid for at a stipulated unit price. Rock should be defined so that there is no dispute and the following language may be used:

"Rock Classification: Only solid rock in ledges, bedded deposits or conglomerate deposits so firmly cemented as to present all the characteristics of solid rock, and which cannot be removed with a ¾ cu yd capacity power shovel without drilling and blasting, and boulders having a volume of more than ½ cu yd, shall be classified as rock."

If rock is known to be present or if it is anticipated, payment lines should be specified so that any additional rock excavation is paid for within prescribed limits. A specification to cover rock payment lines is suggested as follows:

"Rock Payment Lines: In making rock excavation, no payment will be allowed for additional rock actually excavated beyond the following limits:
1. Two feet outside of concrete work for which forms are required, except footings.
2. One foot outside of the perimeter of footings."
3. In all pipe trenches, 6 in. below invert elevation of pipe and 2 ft wider than the inside diameter of the pipe, but not less than 3-ft minimum trench width.
4. Neat outside dimensions of concrete work where no forms are required.

The architect is not responsible for the methods used by the contractor for earthwork operations, nor should he specify how the contractor should perform his work on temporary bracing, shoring, underpinning, sheeting, etc. However to protect the owner’s interest, the architect should include the following provisions in his specifications:

"The contractor shall retain, at his own expense, the services of a qualified soils consultant to advise the contractor on all construction techniques involved in the work, including the design, checking and approval of temporary bracing, shoring, underpinning and other items pertinent to the work, and on construction methods for solution of problems which may be encountered during the prosecution of the work.

The soils consultant shall be primarily concerned with construction methods which will prevent settlement and/or damage to such surrounding structures as sidewalks, roads, utilities and embankments on the owner’s property and on property adjoining the site of the work."

Fills and backfills should be specified to be compacted to achieve the following generally accepted percentages of maximum density at optimum moisture:

<table>
<thead>
<tr>
<th>Location</th>
<th>% Max. Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under slabs on grade</td>
<td>95</td>
</tr>
<tr>
<td>Under paved areas</td>
<td>95</td>
</tr>
<tr>
<td>Under structural members</td>
<td>90</td>
</tr>
<tr>
<td>General grading</td>
<td>85</td>
</tr>
</tbody>
</table>

For each type of soil encountered or for borrow material delivered to the site, one optimum moisture-maximum density curve should be established by an accepted laboratory. These densities should be determined by ASTM D1557. Fill and backfill should be placed in horizontal loose layers in such manner as to produce a thickness after compaction of about 10 in.

To assure compliance with the filling and backfilling compaction requirements, a soil testing laboratory should be engaged to check the compaction specified. Field density tests to determine compliance may be referenced to ASTM D1556, Density in Place by Sand Cone Method, or ASTM D2167, Density of Soil in Place by Rubber Balloon Method. Test requirements can include a test at each layer, providing for one test for every 2500 sq ft of filled area, for general fills, fills under paved areas and under building slabs.
ANOTHER PLUS FEATURE OF SLOAN FLUSH VALVES...

NEW BAK-CHEK

retains water at normal line pressure
to protect against supply line pressure failures

Our "camel" has a new way of storing water. By spring-loading the seat plug of the Sloan Control Stop, we now retain water at normal line pressure in the control stop and in the flush valve when not in use.

This new feature, which we call Bak-Chek, means simply that the retained water is held at normal line pressure regardless of a significant drop or loss of pressure in the supply line—even if a negative pressure develops. This prevents spontaneous flushing or continuous running flush valves when normal supply line pressure is again restored.

Bak-Chek is incorporated in all new Sloan Flush Valves as standard equipment—no extra charge. It is but one of seven flush valve features introduced by Sloan within the past eighteen months—seven more reasons for Sloan's continuing flush valve leadership. For the best in flush valves specify and insist on Sloan—most people do.

SLOAN VALVE COMPANY
4300 West Lake Street • Chicago, Illinois 60624
Aesthetic Zoning Rationale

This first of a two-part article discusses several court cases in which aesthetic objectives are significant in determining zoning regulations.

The legality of zoning restrictions and limitations is traditionally based upon the inherent power of a municipality (sometimes referred to as the police power) to protect the health, safety and welfare of its inhabitants. Zoning for purely aesthetic reasons has not been looked upon by the courts with favor and has often been found to be constitutionally invalid. In recent years, however, aesthetics have become increasingly important in the development of zoning regulations, and the constitutional base for zoning ordinances seeking aesthetic objectives has been broadened by the courts.

The rationale underlying the position of many courts that zoning for purely aesthetic objectives is invalid is based upon the premise that aesthetic standards (as contrasted to standards for public health and safety) vary widely and are determined by individual preferences and subjective judgments. Typical of this viewpoint is an Iowa case (Stoner v. Des Moines, 78 N.W. 2d 843). Involved was a zoning ordinance of the city of Des Moines which required certain billboards owned by the plaintiff to be removed or which required special permission by the city to maintain. The court held that a city may not prohibit billboards because they are unsightly and that aesthetic considerations, since they were a matter of luxury and indulgence rather than of necessity, could not support this exercise of municipal police power.

A similar case in Ohio presenting the traditional point of view is Youngstown v. Con Bros. Bldg. Co., 148 N.E. 842, which held a city zoning ordinance invalid on the ground that it was based purely on aesthetic considerations. This ordinance limited a particular area to single- or two-family homes. The court argued that mere aesthetic considerations could not justify the exercise of the inherent police power of the municipality because there was no essential need for the regulation involved and the public view as to what is necessary for aesthetic progress varies between communities and people. This variability, thought the court, would make it impractical to base restrictions upon the use of property on aesthetic standards.

In Massachusetts there have been contradictory decisions on this subject. In 1936 the Massachusetts Supreme Court upheld a town zoning law prohibiting the erection of certain professional signs in residential districts despite the fact that this regulation was based upon aesthetic considerations. The court came to the conclusion that the appearance of a residential neighborhood relates to the value of the property in that neighborhood and that the value of property is a matter of general welfare which justifies the zoning ordinance. However, in 1949 the same court found a zoning law invalid which placed a particular plot of land in a residential district for the purpose of increasing the attractiveness of the town as a residential community to those approaching it. The court ruled that aesthetic considerations will not alone justify restrictions upon private property for the purpose of preserving the appearance of the town.

The Pennsylvania courts have generally upheld the principle that a zoning ordinance based only on aesthetic factors is invalid. For example, a zoning law which divided a town into districts and provided for different requirements as to the minimum habitable floor area for each district was declared unconstitutional by a Pennsylvania court on the ground that the home owner's right to use his property as he desires cannot be abridged because what he intends to construct may not be aesthetically pleasing.

In New Jersey the courts generally support the view that a zoning ordinance primarily directed toward aesthetic objectives is invalid. In one New Jersey case, for example, a statute which required an 80-ft setback for one-story buildings was found invalid on the ground that this provision was intended for the purpose of beautifying the appearance of the streets. The court stated that aesthetic factors are not matters of necessity "and it is necessity alone which justifies the exercise of the police power to take private property without compensation."

Contrary to a substantial volume of precedent many decisions, particularly in recent years, have upheld zoning ordinances even though they are based solely or predominantly on aesthetic considerations. In Florida, for example, regulations limiting the size of commercial signs and prohibiting the storing of junk within 75 ft of the boundary of any residential district have been upheld on purely aesthetic grounds. In Oregon a zoning ordinance excluding automobile wrecking yards from the city was found valid even though based upon aesthetic objectives.

The trend toward accepting aesthetic standards as justifying zoning limitations is particularly accentuated in Wisconsin and New York. In next month's column we will continue our discussion of this subject.
An innovation in functionally handsome stacking/ganging chairs that cost less, take less space.

Comstac. In four models: side chair, stacking side chair, stacking/ganging tablet arm chair, and arm chair. And all are available in upholstery. Smart, colorful styles ideal for every movable seating need. A stack of twenty Comstac chairs is just 67 1/2" high. Up to 100 chairs can be stored on movable dollies in only 14 square feet of floor space.

The fiberglass Comstac shell is covered with a smooth, protective veil mat surface that’s durable and easy to clean. The “fit-under” legs take less floor space, do not obstruct aisle. Ganging into rows is quick and easy with the clean, simple ganging device.

Comstac—the complete line of contemporary, durable and economical seating. Write Rob Roy Division.

Rob Roy DIVISION TARTAN CORPORATION
2605 East Kilgore Road, Kalamazoo, Michigan 49003  616-349-1521
Formerly Brunswick Contract Furniture Division

COMSTAC
Toward a Management of the Environment

Reviewed by Charles N. Ehler

The reviewer is an Assistant Professor of Urban Design and Urban Planning in the new School of Architecture and Urban Planning at UCLA, where he is developing a program option in Environmental Systems Planning and Management.


Hopeful signs are beginning to appear that a concern for the deteriorating quality of our environment is gradually permeating the general consciousness of society and its institutions. This new "environmental awareness" has quite naturally brought a rush of new publications—a few good, most bad, or at best, superficial. While the half-life of the concern for the environment is difficult to predict, the architect and urban planner, who, at least for the present, are direct participants in shaping the environment for better or worse, should welcome the information and knowledge that can be gained from this new literature.

Several similar themes run through the pages of these three books; their conclusions are basically the same. The authors agree that: (1) the overall quality of the environment of our cities, our nation, and our world is rapidly deteriorating, and, in fact, we are on a collision course with eco-catastrophe; more specifically, (2) we are staring down the throat of the Dismal Theorem (1798) of English economist Thomas Malthus, which briefly stated says that since resources, particularly food, are finite, as population increases, the ratio of resources to man must eventually fall to an unacceptable level; and finally, (3) the scope of our environmental problems is global, calling for united, international action.

Population, Resources, Environment is a timely, comprehensive introduction to the worldwide crisis of overpopulation and its resulting demands on the limiting factors of the earth environment: nonrenewable resources, space, energy, water, food, and heat. It is by Stanford population biologist Paul Ehrlich, father of The Population Bomb (1968).

The book sums up the present world situation as follows: (1) the planet is grossly overpopulated considering present behavior patterns and technology; (2) major hindrances to solving human problems are the absolute number of people and the rate of population growth; (3) the limits of human capability to produce food by conventional means have nearly been reached; (4) attempts to increase food production further will tend to accelerate the destruction of our environment, which in turn will eventually reduce the capacity of the earth to produce food; (5) population growth increases the probability of a lethal worldwide plague or thermonuclear war or both; (6) the solutions to environmental problems involve dramatic and rapid changes in human attitudes.

Ehrlich believes that one of the major pollutants of the earth system is man himself. He states: "...The absolute size of the human race is now so large that it is perhaps the single most important factor we have to consider in discussing man's future, and its present unprecedented rate of growth adds to the urgency of the problem. ..." Ehrlich's conclusion is based on science fact not fiction. He does see an end in sight to the population explosion, however, not due to the impact of birth control, but rather to a rise in the death rate, largely due to famine.

The destruction that Ehrlich discusses is most apparent in our cities. Demographer Kingsley Davis has extrapolated world urbanization trends and has produced the following amazing statistics: if the urban growth rate that has prevailed since 1950 continues, half of the world will be living in cities by 1984; carrying that same trend forward to the year 2020, half of the world's human population would be in cities of over one million; and by 2044, the largest city would have a population of 1.4 billion people of a projected world population of 15 billion.

Ehrlich recommends a de-development of the United States, i.e., bringing our economic system, particularly our patterns of consumption, into line with the realities of ecology and world resources.

Resources and Man, a report by the Committee on Resources and Man of the National Academy of Sciences/National Research Council, updates a similar study by Brown, Bonner, and Weir (The Next Hundred Years, 1957) and a series of 1962 reports to the Committee on Natural Resources of the NAS/NRC. The Committee on Resources and Man was established "to evaluate national and world resources in the light of current and expected stresses and to identify problems in need of study as well as opportunities for progress." The book reviews the critical aspects of the resource situation in an ecological context. Its underlying assumptions are explicit, its scope is broad, its view is long-range, and it is brief.

In an introductory, philosophical paper, titled "Man and his ecosystem," ecologist Marston Bates sees man's major form of environmental destruction as his attempt to simplify the biological relationships within the ecosystem to his own advantage. "...The danger in the simplified ecosystem is in its liability to catastrophe. ...From diversity comes the possibility of change, of adaptive response to new conditions, of development and evolution."

Canadian geographer John Chap.

(Continued on page 126)
Atlantic’s carpet of Vectra® fiber gets underfoot at basic training.

Atlantic “Spartan” tufted carpet took what the Army dished out . . . bonded to a trainee’s combat boots! We set up the situation to prove an important point. That whatever stain and wear-prone place you want to carpet . . . be it hospital, schoolroom or hotel lobby . . . Spartan is equal to the task. And then some. Witness how it cleaned up after Nature and Drill Instructors got through with it! Couple this stain and wear resistance with Vectra fiber’s extraordinary resistance to fading, and you have a carpet that can pass any physical fitness test. Atlantic Spartan tufted carpet, made with spun yarns of 100% Vectra fiber. Put it through the paces.

After a rough day in the field, Atlantic’s carpet of Vectra® fiber looked like this . . .

... and cleaned up like this.

Atlantic Rugs, Inc. / Box 29
Calhoun, Georgia 30701
Please send me samples and information on Atlantic “Spartan” carpet.

NAME
COMPANY__________________________
ADDRESS______________________________________________________
CITY___________________________________________________________
STATE________ ZIP________

128,300 sq. ft. of free-access Weberfloor . . .

pays off in new 12-story Chicago office building.

Typical of the growing trend toward access flooring in general construction is the American Hospital Association's new building, designed by Chicago architect, Richard O. Evans of Schmidt, Garden & Erikson.

The structure's 128,300 square feet of free-access Weberfloor, 90% of it carpeted, was installed for less than $2.00 per square foot exclusive of floor covering. Most of this figure will be offset by a combination of immediate savings in construction costs and future maintenance economies.

By providing ample, fully accessible underfloor space for electrical services, the Weberfloor system completely eliminated the cost of headers and raceways in the floor slabs. Pedestals were installed on the semi-finished slabs and then adjusted for height. Power troweling was eliminated. Floor slabs were poured as soon as formwork and reinforcing were in, with mechanicals installed later on top of the slab. Result: a shorter pour schedule that moved completion ahead a full month.

Future savings and complete flexibility in use of the building's floor space are even more attractive. Because Weberfloor panels can be raised and interchanged at will, electrical and telephone lines can be reached and relocated economically, without slitting carpets or drilling concrete.

Write for free booklet. The use of free-access Weberfloor in two major applications and its significant advantages for general construction are covered in detail. Write for your copy to Weber Architectural Products, Division of Walter Kidde & Company, Inc., 1340 Monroe Avenue N.W., Grand Rapids, Michigan 49502.

On Reader Service Card, Circle No. 391
of subtle variations on the square and cylinder, our 7 Line luminaires, combine with sculptured wood standards that enrich the visual environment of walkways, parking areas, landscaping and buildings. Another outstanding example of mcPhilben's concept of lighting continuity, this luminaire embodies our unique unitized cast aluminum construction. Naturally, anodized to last the life of your building. The strength of geometric forms, and the warmth of wood provides exciting new architectural statements. 7 Line Woodscape Lighting . . . let it stimulate your imagination!

*Trademark of Weyerhaeuser Company*
One moment they're handsome wardrobe racks, chalkboards or tackboards...a few seconds later they've converted an open plan school room into efficiently arranged classrooms to accommodate any size class or teaching requirement! Trust Vogel-Peterson to bring you the room-making magic of dual purpose RDF (Schooline Room Divider Wardrobes)...6 or 8 feet long sections that move silently and effortlessly on large rubber-tired casters...sturdily made, beautifully detailed and finished in colors that complement the most modern decor. Have them in any combination you wish—tackboard both sides, chalkboard both sides, or tackboard/chalkboard combination or tackboard side can be accessorized with wardrobe racks and book or boot shelves. School planners welcome their versatility...teachers like their efficiency and kids can’t hurt them. Look into these versatile units—they’re designed with you in mind.

The RDF’s are just one of a most complete line of coat racks and wardrobes designed to meet today’s changing needs. Write for our complete catalog SL-510.

Vogel-Peterson COMPANY
"The Coat Rack People"
ELMHURST, ILLINOIS
man in a paper on "Interactions between man and his resources" defines the ecological approach as seeing "the natural world as a series of inter-related systems in a state of dynamic equilibrium into which man intrudes as an unbalancing factor. The study of these complex, inter-related systems by proponents of this approach has led to support for multiple-path, multiple-choice, and systems analysis methodology in dealing with resource problems rather than 'linear chain-reaction determinism'."

While the birth rate of the United States has been declining since 1957, and France and Japan's population growth rate appears to be almost stationary, demographer Nathan Keyfitz points out that on a global scale the rate of annual population increase has reached 2 percent or higher as of 1968. A rate of 2 percent applied to a population of 3.5 billion people gives an annual increase of 70 million people — only eight countries have populations as large as 70 million people! Such a rate of increase amounts to a new United States every three years, a new Chicago every two weeks.

In his paper, Sterling B. Hendricks of the Mineral Nutrition Laboratory of the U.S. Department of Agriculture states: "... The danger signals are up with respect to excess population demands for food supply as much as for other resources. It is folly to ignore them." William E. Richer of the Fisheries Research Board of Canada estimates that food production from the sea can be increased to not much more than 2.5 times that being produced in 1968.

He points out that the world's ocean and inland waters cannot begin to supply a complete ration for the world's peoples.

In the final and longest paper, M. King Hubbert of the Geological Survey concludes: "Looking into the future, ... the physical realities discussed in this book dictate that the curve of human population must follow one of three possible courses: (1) It could continue to rise for a brief period and then gradually level off to some stable magnitude capable of being sustained by the world's energy and material resources for a long period of time; (2) it could overshoot any possible stable level and then drop back and eventually stabilize at some level compatible with the world's resources; or (3) finally, as a result of resource exhaustion and a general cultural decline, the curve could be forced back to a population corresponding to the lowest energy-consumption level of a primitive existence. The one type of behavior for this curve that is not possible is that of continued and unlimited growth. It is interesting to note that in their July 1970 report the President's National Goal Research Staff, apparently not influenced by Ehrlich, NAS/NRC or the countless other population biologists, demographers, or ecologists who have testified to the contrary, sees the issue of population as one of distribution, not of new growth.

In the final book, 1976: Agenda For Tomorrow, Stewart L. Udall, former Secretary of the Interior under Presidents Kennedy and Johnson, begins with the premise that "... our failure to achieve the balanced pattern of growth that is the hallmark of a genuine civilization (can be)
Carpeting of Herculon...because you can't get by on looks alone.

It's obvious that you would put carpeting in your mobile or manufactured homes, plus your models, because it has great sales appeal. But it should also be obvious that you and your customers need carpeting that can clean easily, resist stains, and handle heavy traffic. Carpeting of HERCULON* olefin fiber does the job. Better than anything else. And longer.

For more information, contact Fibers Merchandising, Hercules Incorporated, Wilmington, Delaware 19899.

At Hercules, it's our job to make your job easier.

*Hercules registered trademark
Nine years of painstaking research have gone into the planning of Boston's Tufts-New England Medical Center. As a result there has been a careful meshing of the needs of the community, hospital and patient. Advanced concepts of patient service dictated horizontal, as opposed to tower, layouts. This in turn made necessary the securing of air rights over Boston's busy Washington Street and underground transit system. Like other buildings confronted with the problem of annoying vibration, the Center has specified lead asbestos vibration isolation pads (see detail drawing).

Perhaps lead in form of pads or sheet can be a space saver for you in making maximum use of air rights as well as space under pools and planters. For assistance write Lead Industries Association, Inc., Dept. MM-11, 292 Madison Ave., N.Y., N.Y. 10017.

On Reader Service Card, Circle No. 361
Designers can specify Carlstadt Railing for its wide selection of moulding shapes and fittings that allow custom designs for all building types and traffic exposures.

Carlstadt's rugged, engineered system is well-suited for floor, fascia or wall-mounted installations that emphasize function and durability. Its crisp styling makes it ideal for a variety of ornamental applications.

Components are available in stainless steel, bronze and aluminum from local fabricators everywhere. For a complete listing write for catalog, special bulletins, or see Sweet's Architectural File, Industrial File or Interior Design File.
TO HONOR crowning achievements in the use of steel

AMERICAN IRON AND STEEL INSTITUTE ANNOUNCES THE FIFTH BIENNIAL DESIGN IN STEEL AWARD PROGRAM.

To provide wide recognition for outstanding contributions by individuals or teams of practicing architects, designers, engineers and artists, American Iron and Steel Institute announces the 1970-71 Design in Steel Award Program.

There is no entry fee. Submissions should include a completed entry form together with one to four photographs or drawings and a brief description of the entry, which may be any product, structure, component or art work offered for sale or completed after January 1, 1968. Submissions must be postmarked no later than January 29, 1971.

Two awards are offered in each of the categories listed below—one for the best design in steel, with emphasis on aesthetic appearance, the other for the best engineering use of steel.

The categories are:
- Appliances, housewares and household equipment
- Agricultural equipment
- Business equipment
- Educational products
- Environmental enhancement and control equipment
- Furniture
- Medical and scientific equipment
- Industrial products
- Transportation
- Residential construction
- Low-rise construction
- High-rise construction
- Public works construction
- Art in steel: fine arts; crafts

A distinguished panel of leaders in the fields of engineering, design, architecture and the fine arts will judge the entries.

For complete information and entry form, write to Design in Steel Award Competition, Room 2302, 201 E. 42nd Street, New York, N.Y. 10017.

Long the preferred metal for its strength and durability, bright, versatile steel is finding new applications everywhere—from the most modern skyscraper detailing to the latest space shot. It is indeed a metal for man’s crowning achievements.
Millions of square feet opened up for carpet by one simple idea!

Everybody wants carpet. For aesthetics, sound absorption, low-cost maintenance, employee morale, comfort underfoot, insulating qualities. But too often, carpet couldn't be specified. This proven system removes most of the barriers.

LOWER INITIAL COST — less than identical carpet plus separate underlayment, or foam or rubber backed carpet with equal pile specifications.

CLEAN PICK-UP FROM FLOOR — carpet can be lifted to reach trench headers, intact for re-installation.

EASY WHEEL AND CASTER MOBILITY — with standard contract pile construction, no mushiness to bog down carts, mobile equipment, secretarial chairs.

HELP IN MEETING FIRE SAFETY CODES — provided the carpet is otherwise qualified.

Key to success is Jute secondary backing, porous enough to retain adhesive. This assures strong, permanent bonding to any sub-floor or previously installed resilient flooring. Shifting and strain on seams are virtually eliminated. In tufted carpets, specify primary and secondary backings of Jute, because their compatibility provides greatest protection against delamination.

JUTE CARPET BACKING COUNCIL, INC.
25 Broadway, New York, N.Y. 10004

Write for Architectural Guide Specification
Prepared by
William E. Lunt, Jr., C.S.I.
Lower decibels... Less damage on KREOLITE wood block floors

Check These Advantages

Comfortable...easy under foot. Durable...withstands heavy abuse. Low Maintenance...1/3 cent per sq. ft. in 20 years. Easy To Replace...in sections or units. Dustless...protects bearings and finished parts. Absorbs Noise. Insulates against heat and cold. Easy to Provide For Conduits Or Cables.

Resilient Kreolite Wood Block Floors protect against damage to dropped tools and parts; absorb noise and vibration; eliminate dust for better lighting and health; prevent slipping; provide spark-free safety. Write for the research report that proves this. Or ask to see our full-color sound slide film—"Magic Carpet."

Inquiries Limited to Continental U.S.A.

THE JENNISON-WRIGHT CORPORATION
DEPT. P-110 P. O. BOX 691 • TOLEDO, OHIO 43601
□ Please send a copy of Research Report Highlights
□ Please call for an appointment to show the "Magic Carpet"

Name
Title
Firm
Address
Let's face it, Malaysian meranti doors impress people.

And that's a very good reason for spending the few extra dollars it costs to carve them.

These doors give your prospective buyer an impression of luxury from the moment he walks into your house.

It's not only that they're exquisitely carved. That's impressive enough.

But the big thing is, they're made of an exotic hardwood.

It's Malaysian meranti.

And that's very impressive. Because Malaysian meranti is basically a furniture wood. And looks a lot like its cousin, mahogany.

So these doors can give just the touch of elegance that often helps close a sale.

But, frankly speaking, we think Malaysian meranti is better than mahogany in many ways.

It's lighter in color. So it's easier to finish. Especially if you want to use a light stain.

Of course, the style shown here is just one of the many St. Regis door styles. We'll be glad to send you the catalog on all our Malaysian meranti and other fine doors.

And if you don't see what you want, we'll custom-build it for you. Impressed? Write us at Box 1593, Tacoma, Washington 98401.
identified as the main American weakness." Writing on what he terms the "urban affliction," he blames the uninspired leadership that came from politicians and planners in the post-World War II era, for "the failure to build livable cities and the closely related failure to make a multiracial society work."

Udall joins the other authors in concluding that population pressure is "the paramount impediment to an environment that will promote life-enhancing opportunities in all nations... For a nation proud of its scientific prowess, we are remarkably fatalistic about the future."

As an answer to our urban problems, Udall proposes Project 76, "a plan that will enlist all segments and cities of America." He states: "A program that embraces the all-encompassing dimensions of the new conservation must be an integral part of Project 76... The cost accounting of the upcoming age of ecology will... entail an application of the systems approach to the intricate system of life itself... These dimensions will compel the architect, the industrial designer, and the government functionary to become aware of all the ramifications of change."

While maintaining faith in the existing institutions of government, Udall criticizes the Congress for failing in its most vital function: the synthesis, shaping, and supervision of the nation's paramount goals and priorities. He suggests that the House and Senate sit for two or three weeks each year as a committee of the whole to undertake a "searching analysis of our national performance and aspirations." Out of this meeting might come "a new intimacy between the Congress and the people... (and) once Congressmen realized that their constituents were enlightened on vital issues, they would be better able to function with informed perspective — rather than skilled special-interest pressure — as their main guide."

Together, these three books lead us a step forward in explaining the present and anticipating the future of the earth system. Hopefully these authors will not suffer the same fate as the Greek prophetess, Cassandra, who was never believed, but whose predictions always came true.

**QUESTION for architects:**

Can your clients afford hand-woven Aubusson tapestry in their new buildings?

**ANSWER:** You may be pleasantly surprised to learn how modest is the cost. Though Aubusson tapestry is one of the world's most exclusive art forms, and though it takes a skilled weaver a month to turn out a single square yard, the cost is actually less than oils or murals of comparable size by artists of comparable stature. Write us of your latest projects and let us tell you how tapestry may enrich them.

**ART VIVANT, INC.**

*Authorized Agents, Manufacture de Tapisseries d'Aubusson*

173 Highridge Road New Rochelle, N.Y. 10804
tel: (914) 632-8700

Visit our permanent exhibit at the showrooms of Stephen Mallory Preferred, 150 E. 58th Street, New York (11th floor) — Mon. thru Fri., 9 to 5:30

---

**NOTICES**

**Partners and Associates**

SKIDMORE, OWINGS & MERRILL, ARCHITECTS, Portland, Ore., have appointed GEORGE T. OKAMOTO, EDWARD D. PEDERSEN, PHILIP A. RUDE, and ROBER L. SCHULTZ as participating associates.

FLYNN, DALTON, VAN DIJK & PARTNERS, Cleveland, Ohio has named NEIL WILLIAM GUDA, FRED H. HOLMAN, JR., and PAUL J. GRIECO as associates.

W. ALLAN TUOMAALA AIA has been appointed vice president and ARNOLD F. SERLIN AIA, has been named secretary of LEONARD G. SIEGAL ASSOCIATES, INC., ARCHITECTS, Detroit, Mich.

RAYMOND and SIDNEY EPSTEIN have announced the appointment of RALPH EPSTEIN as president of A. EPSTEIN AND SONS, INC., of Chicago, New York, Washington, D.C., and Paris.

BERNWARD U. KURTZ AIA is now an associate with THE EGGERS PARTNERSHIP, New York, N.Y.

ROY C. NEUMANN has been elected to the board of directors of STANLEY CONSULTANTS, Muscatine, Iowa.

(Continued on page 150)
Another step towards a perfectly dry Manhattan.

New York City's World Trade Center, which will cover thirteen city blocks, will be one of the largest building complexes in the world.

And it'll also be one of the driest because Tremco sealants and glazing systems will be used in the right places.

Take the two 110-story twin tower buildings. They will use Tremco's Polysulfide Lastomer, the non-oxidizing, non-shrinking sealant. It's ideally suited to situations that anticipate dynamic movement of the joint. And provides excellent adhesion to metal without priming.

They will also use Tremco Acoustical Sealant to reduce sound transmission. And Tremco Curtain Wall Sealant on unexposed joints.

The Tremco glazing system — Mono, Pre-shimmed 440 Tape and Vision Strip — is also recommended for the plaza buildings surrounding the skyscrapers. And there are good reasons why: Weather tightness. Windows that are evenly balanced for high wind loads. No pressure points. And neat sight lines. So whether you're planning to build a 110-story skyscraper or a one-story warehouse, Tremco can solve the sealant problems. No, we don't have an all-purpose sealant. We're just an all-purpose sealant company. Call your Tremco Representative today and see for yourself.

The Tremco Manufacturing Company, Cleveland, Ohio 44104. Toronto 17, Ontario.

TREMCO
The water stoppers
For an easy-to-apply, permanent water barrier, use GACOFLEX urethane rubber, liquid waterproofing membrane on all your jobs.

A black, 100% solids compound, UWM-28 is specifically formulated for between slab waterproofing membranes. It cures at ambient temperatures to provide a 1/8" seamless membrane.

GACOFLEX liquid waterproofing membrane is a two-part compound that's easy-to-use. It can be applied to any clean, dry surface and is prepackaged in four gallon units in the proper proportion to cover 100 square feet. Used in liquid form, it goes on quickly with a tampico roof brush or notched trowel.

GACOFLEX UWM-28 is suitable for use above or below grade, and dries tack free overnight. Substantial cure takes place in three to four days at temperatures in the range of 80°F. The resulting membrane is a chemically resistant rubber sheet, 60 mils thick, that remains tough and flexible at temperatures as low as —92°F. It may be exposed to temperatures up to 300°F for short periods with no softening, sag or flow. UWM-28 is unaffected by exposure to normal grease and aliphatic oils.

Write for complete details and specifications.
WHEN IT COMES TO METAL WALLS THERE IS A DIFFERENCE—WE PLAN IT THAT WAY

Where's the difference?

It's in skillfully engineered building wall panel systems that please and protect for years and years;
It's in component flexibility and careful attention to details;
It's in Walcon's unique innovative capabilities with industrial and architectural metals;

It's in "easy on the budget" satisfaction that planners welcome;
It's in the Walcon practice of dedicated responsibility;
It's in our total organizational commitment to assure the buyer of quality when Walcon products are specified;
It's in —when you specify Walcon.

WALCON

WALCON CORPORATION • ECORSE, MICHIGAN 48229
(313) 382-1500

PANELS • DECKING • LOUVERS
Free technical data* on fire doors and frames

ask for Steelcraft "spec-pak" F-28

This "spec-pak" consists of a technical manual on fire doors and frames. This manual contains information about the various available fire doors, where fire doors should be used, the types of hardware to be used on fire doors, actual illustrations of the various fire door labels and photographs of a typical fire test. For ready reference a copy of ASTM E 152-66 (Standard Methods of Fire Tests of Door Assemblies) is part of the manual. A complete bibliography of technical information and where to obtain this information is part of this "spec-pak.

Write today for your free Steelcraft "spec-pak" F-28.

*Available only to architects, contractors, engineers and other key specifiers.

Free technical data* on fire doors and frames

ask for Steelcraft "spec-pak" F-28

This "spec-pak" consists of a technical manual on fire doors and frames. This manual contains information about the various available fire doors, where fire doors should be used, the types of hardware to be used on fire doors, actual illustrations of the various fire door labels and photographs of a typical fire test. For ready reference a copy of ASTM E 152-66 (Standard Methods of Fire Tests of Door Assemblies) is part of the manual. A complete bibliography of technical information and where to obtain this information is part of this "spec-pak.

Write today for your free Steelcraft "spec-pak" F-28.

*Available only to architects, contractors, engineers and other key specifiers.

Free technical data* on fire doors and frames

ask for Steelcraft "spec-pak" F-28

This "spec-pak" consists of a technical manual on fire doors and frames. This manual contains information about the various available fire doors, where fire doors should be used, the types of hardware to be used on fire doors, actual illustrations of the various fire door labels and photographs of a typical fire test. For ready reference a copy of ASTM E 152-66 (Standard Methods of Fire Tests of Door Assemblies) is part of the manual. A complete bibliography of technical information and where to obtain this information is part of this "spec-pak.

Write today for your free Steelcraft "spec-pak" F-28.

*Available only to architects, contractors, engineers and other key specifiers.

Free technical data* on fire doors and frames

ask for Steelcraft "spec-pak" F-28

This "spec-pak" consists of a technical manual on fire doors and frames. This manual contains information about the various available fire doors, where fire doors should be used, the types of hardware to be used on fire doors, actual illustrations of the various fire door labels and photographs of a typical fire test. For ready reference a copy of ASTM E 152-66 (Standard Methods of Fire Tests of Door Assemblies) is part of the manual. A complete bibliography of technical information and where to obtain this information is part of this "spec-pak.

Write today for your free Steelcraft "spec-pak" F-28.

*Available only to architects, contractors, engineers and other key specifiers.

Free technical data* on fire doors and frames

ask for Steelcraft "spec-pak" F-28

This "spec-pak" consists of a technical manual on fire doors and frames. This manual contains information about the various available fire doors, where fire doors should be used, the types of hardware to be used on fire doors, actual illustrations of the various fire door labels and photographs of a typical fire test. For ready reference a copy of ASTM E 152-66 (Standard Methods of Fire Tests of Door Assemblies) is part of the manual. A complete bibliography of technical information and where to obtain this information is part of this "spec-pak.

Write today for your free Steelcraft "spec-pak" F-28.

*Available only to architects, contractors, engineers and other key specifiers.
Bally Refrigerated Warehouse Buildings . . . like Bally Prefab Walk-Ins . . . keep pace with the evolution in mass feeding. Food processing and commissary cooking for satellite distribution require giant capacity refrigerated buildings. Bally’s pre-fabricated / pre-engineered refrigerated structures can be assembled quickly in any size up to 36 feet high with standard metal-clad panels. Urethane insulation, 4-inches thick (equal to 8½” fiberglass) cannot pick up moisture . . . is ideal for outdoor use. Factory assembled refrigeration systems are easy to install and service. They fill every temperature requirement, (as low as minus 40°F), for processing or storage. Learn about important Bally features from our 32-page book and urethane wall sample.
This Connecticut home would be striking even if it didn't revolve. But it does. Turning 360 degrees in either direction in 48 minutes. Creating excitement and looking elegant every inch of the way.

The unique design is almost overpowering.

Almost. The exterior application of red cedar shingles provides just the right touch of restraint. Cedar's rich texture lends the structure a look of stability and warmth. And makes the home feel at home in its natural environment.

On the practical side, red cedar shingles form a naturally insulative barrier against weather extremes. They withstand even hurricane winds. And they remain...
Red cedar shingles round out a revolutionary design.

maintenance-free for decades.

Complement your next design with the enduring beauty of red cedar Certigrade shingles or Certi-Split shakes. They’re worth it. For details and money-saving application tips, write: 5510 White Bldg., Seattle, Washington 98101.

(In Canada: 1055 West Hastings St., Vancouver 1, B. C.)
The best part of Powerbond® is the part you never see.

Our vinyl backing is like nothing else. Like nobody else's.

The base material for Powerbond pile vinyl has closed-cell construction which means water—or anything else—can't penetrate the base material. Unlike sponge rubber, it can't deteriorate.

Matter of fact, it's the only material that flushes back water.

There are some pretty terrific other things going for Powerbond. Like a luxurious, super-dense pile of Anso™ nylon by Allied Chemical that's extraordinarily rugged, abrasion resistant, resilient. Plus excellent sound deadening properties.

It's easier to clean because that super-dense pile holds spills, dirt and dust on the surface.

Deliveries are from 3 to 4 weeks from day of order. And we offer guarantees against excessive wear.

Powerbond pile vinyl. In 24 colors. 3 textures. To build employee morale. It's what a floor covering always should have been.

Collins & Aikman makes the pile vinyl that makes things happen.

Please send me more information and swatches.

Name__________________________________________  513

Firm____________________________________________

Street___________________________________________

City_________State_______Zip_______________________

Collins & Aikman
210 Madison Avenue, New York 10016
One of the problems in choosing a door is knowing which door to choose.

There are tall doors, short doors, wide doors, thin doors, fire doors, sound-proof doors, solid-core doors, hollow-core doors, wardrobe doors... you're not the first to have problems deciding on the right one. Every one of your buildings needs such a variety of doors. Then codes, design and cost problems must be considered. And considering the wide variety of doors available, who wouldn't have trouble? There is just too much material put out by the manufacturers for you to get through.

So let U.S. Plywood help make the decisions. Any one of our Architectural Service Representatives knows all the possibilities for your door specifications. He should. He spends all his time working with architects and is constantly being trained in door design and performance.

U.S. Plywood has more people who know more about doors than any other manufacturer.

And even if you find yourself in a situation we don't know about, we know where to find the way out.

If you have a problem with doors, call our Architectural Service Representative. He's ready to work with you now.

Just phone, or find your way to the nearest U.S. Plywood Branch Office.
SEE BETTER than you do with typical troffer lighting WITH LESS LIGHT in the zones that produce glare and veiling reflections.

Our new HVP (High Visual Performance) luminaire enables you to see better because most of its light output is within the 30°-60° zone, and only a relatively small portion is directed more horizontally (into the glare zone) or more vertically (into the veiling reflection zone).

HVP is a low-brightness luminaire that is very comfortable to live with. For instance, in a 60' x 60' office lighted to 100 footcandles it yields a Visual Comfort Probability of 95. This means that 95% of the people seated in the least favorable position—at the rear wall directly under a row of lights—will still find the lighting comfortable. Visual comfort reduces fatigue and assures a more efficient working environment.

Another important benefit from HVP is the reduction of veiling reflections, those reflections of the light source in the task which decrease the contrast between detail and background and make seeing more difficult. If you’re having trouble with reading this page it may be because reflections of the light source are bouncing up into your eyes, masking the words you are trying to see. You can, of course, get rid of the problem by tilting the page or moving your head, but this can be inconvenient and awkward, especially if you are working at a desk in an office or classroom.

Wouldn’t it be better if the lighting system itself provided the solution by reducing that part of the light that is reflected back into your eyes and increasing the part that helps you see the print? That’s what HVP does.

Since HVP provides better visibility, it will, in a number of situations, permit the use of fewer fixtures, with related savings in installation cost, branch circuiting and air conditioning. In almost every case this new low brightness system will create a less distracting, quieter, more agreeable ambience.

HVP utilizes two 40-watt fluorescent lamps. It is 12” wide, precisely modular, and is designed to supply or to return air.

Another Lightolier contribution to the architecturally integrated luminous environment.

Write Lightolier, 346 Claremont Avenue, Jersey City, N.J. 07305.
All Vinyl Wallcoverings are not created equal
And beautiful, durable VICRTEX V.E.F.
Vinyl Wallcoverings prove it.

The two most dangerous words in your specifications section are "or equal." They often open the door to severe disappointments and dissatisfaction with a finished project. With vinyl wallcoverings this is particularly true. Because no other vinyl wallcoverings can match the rich textures, luminous colors, unique patterns and superior stain-resistant finishes of Vicrtex.

When you specify Vicrtex V.E.F. Vinyl Wallcoverings, you're perfectly justified to regard that "or equal" clause for the danger it is. Tighten your specs, double-check along the way, and make certain your beautiful design becomes a beautiful reality.

Write today for our helpful booklet: "A Practical Guide to Specifications, Selection and Use of Vinyl Wallcoverings."

L. E. CARPENTER AND COMPANY
964 Third Ave., New York, N.Y. 10022
(212) 355-3080

On Reader Service Card, Circle No. 390

(Continued from page 188)

New Addresses
FERRENZ & TAYLOR, 810 Seventh Ave., New York, N.Y. 10019.

JEROME H. PARMET, INC., 8 W. 40 St., New York, N.Y. 10018.

A.A. ALLART & ASSOCIATES, 203, 709-11 Ave., S.W., Calgary 3, Alberta, Canada.

FRANK SACK, 4936 Elliot Ave., South, Minneapolis, Minn. 55417.


RENZO PIANO, 15-29 Piazza della Victoria, Genoa, Italy.

New Firms
WARREN E. KAFFKA ARCHITECT, 62 High Ridge, Ridgefield, Conn. 06877.

RICHARD ZEGLER, NEUMANN & TAYLOR AIA, 114 E. 32 St., New York, N.Y.

FRIDAY ARCHITECTS/PLANNERS, 26 South 20 St., Philadelphia, Pa. 19103.

J. ROLAND LIEBER, ASLA, landscape architect has opened offices at 1109 East Las Olas, Fort Lauderdale, Fla. 33301.

Mergers and Expansions
JOHN LoPINTO, ARCHITECT and PISANI AND FALCO ASSOCIATES, ARCHITECTS AND PLANNING CONSULTANTS merged to form LoPINTO, PISANI, FALCO ARCHITECTS, 1295 Northern Blvd., Manhasset, N.Y. 11030.

PECKHAM-GUYTON, INC. ARCHITECTS of St. Louis, now has an office at 411 Nichols Road, Kansas City, Mo. 64112.

KUNHARDT AND ROGERS of New York, N.Y. has opened an office at 1109 E. Las Olas Blvd., Ft. Lauderdale, Fla. 33304.

GOLDEN THORTON LABAU INC., ARCHITECTS, West Hartford, Conn. has announced a new interior design department, with CLIFFORD MITCHELL as Architect in Charge.

SCHAEFER SCHIRMER & EFLIN ARCHITECTS, ENGINEERS & PLANNERS, announces an office at 808 Merchants National Bank Building, Topeka, Kans.

Name Changes
ROBERT GOETZ ASSOCIATES has formed the new firm of GOETZ, HALLENBECK, & GOETZ, Oakland, Calif.

THE PIERCE, LACEY PARTNERSHIP, INC. ARCHITECTS AND PLANNERS is the new name of PIERCE, LACEY & ASSOCIATES, Dallas, Tex.

This valuable new book is yours for the asking!
CAST IRON SOIL PIPE & FITTINGS HANDBOOK
A comprehensive, authoritative textbook, fully illustrated, complete with statistical tables, calculations and charts, giving abbreviations, definitions and recommended symbols.
Invaluable if you design, estimate or install plumbing systems.
To receive your free copy, address a request on your company letterhead to:
CAST IRON SOIL PIPE INSTITUTE
2023 8 Street, N.W.
Washington, D.C. 20006
ALLOW 4 WEEKS FOR DELIVERY

FREE!

CAST IRON SOIL PIPE INSTITUTE
2023 F Street, N.W.
Washington, D.C. 20006
ALLOW 4 WEEKS FOR DELIVERY

On Reader Service Card, Circle No. 390

NOVEMBER 1970 P/A
It's no wonder. After all, we do make the broadest line of architectural cabinet hardware on the market. The latest addition to the line is the new extruded aluminum pulls. There are lots of other things too: pulls, hinges, pivots, catches and knobs. They come in all styles, sizes, metals and finishes. You'll find information on the whole line in our new cabinet hardware brochure. Write for it today. We think you'll be glad you've included Stanley. No matter how your plans shape up. Stanley Hardware, Division of The Stanley Works, 195 Lake St., New Britain, Conn. 06050. In Canada: The Stanley Works of Canada, Ltd.
Single-layer cable system supports 320-ft-dia coliseum roof

Set into the edge of a 14-acre, man-made lake, the circular coliseum seats from 7,336 to 11,027, depending upon the particular event. There are extensive exhibit and banquet facilities. Parking areas on the full 75-acre site accommodate 3,200 cars and 25 buses.
The new $6.5-million Hampton Roads Coliseum serves more than a million people in Tidewater Virginia with sports events, exhibitions, shows, and conventions under its column-free roof. Located in Hampton, the facility is convenient to Norfolk, Newport News, and Portsmouth.

MORE THAN 1.3 MILES OF STEEL CABLE. Bethlehem Steel provided 7,344 ft of 2-in.-dia, zinc-coated pre-stretched, steel strand for the single-layer cable roof. Shipped in specially packaged coils—48 lengths, each 153 ft long—the cables were fabricated with open sockets on one end and adjustable anchor sockets on the other.

SIMPLE ERECTION PROCEDURE. In the roof erection scheme, the steel tension ring was raised to the height of the perimeter connection points and supported by falsework. Next, the anchor-socketed ends of the cables were lifted, one by one, to the perimeter connecting points where they were inserted through weldments and affixed with spanner nuts. Then, cables were lifted and connected to the tension ring. After all 48 cables were in place, the tension ring was lowered to its final position via the removal of the upper part of the falsework. (A six-in. length of thread, specified for the end of the anchor socket, permitted final adjustment of cable lengths.)

INTEGRATED SUPPORT SYSTEM. The compression ring, normally present in a cable system of this type, is located 17½ ft below the tops of the diamond-shaped perimeter panels. The panels were designed to be reminiscent of white boat sails characteristic of the Tidewater area.

STRUCTURAL STEEL ON CABLES. Some 350 tons of Bethlehem steel plate and structural members were used in this structure. Of these, about 50 tons were light shapes, which were placed atop the cables. They support the unusual folded roof which melds into the side panels. The area under the roof and above the cables contains a portion of the coliseum's mechanical and electrical system, including ductwork for its 1,000-ton air-conditioning unit.

CABLE DATA AVAILABLE. Bethlehem furnished the information required for the specification of cables and end-fittings for this major structure. We'll be happy to supply this data for your designs. Just write: Room 1049 HRC, Bethlehem Steel Corporation, Bethlehem, PA 18016
Plywood design collection:

Usdan Center for the Arts, Huntington, New York.

Owner:
Henry Kaufmann Campgrounds, Inc., an agency of the Federation of Jewish Philanthropies.

Architects:
Conklin & Rossant.

Structural engineers:
Lev Zetlin & Associates.

Contractor:
Reema Construction Co.
An architectural hard-edge goes to camp.

The buildings are basically open-air, wood- and steel-frame structures with a plywood skin. Plywood is also exposed on the interiors. The buildings are multi-planar or vaulted in form. Differing planes or surfaces are separated by a hinge-like joint as shown in the detail.

The adaptability of plywood makes it possible to achieve the strikingly different shapes of sixty-seven arts buildings with a single material—economically.

Usdan Center is just one example of plywood’s unusual structural capabilities and potential for innovative design. For more information on new building systems and textured plywood design ideas, send the coupon.

One of a series presented by members of the American Wood Council.
More than 700 packages like this were received by PROGRESSIVE ARCHITECTURE between July and September. Each one is an entry in the 18th Annual Design Awards competition. Each one is a design idea that could well be a major breakthrough in schools, commercial buildings, hospitals. In any of the twelve categories covered by the competition.

The submissions are judged by a panel of distinguished architects, critics, educators and engineers who come to our Stamford offices to
This could be the most exciting architecture of the seventies

appraise the entries and render their judgments.

Validity of the judgments? Ada Louise Huxtable, Pulitzer Prize winning critic of THE NEW YORK TIMES calls them “an almost uncanny forecast of trends, styles and emerging personalities at the top level of architectural design.” Further evidence: more than 85% of the winning designs are built and become noteworthy examples of the milieu.

Many building product advertisers lend their support to the January issue. It’s their way of casting their corporate votes for good design and good designers. May we suggest that you take note of the advertisers who help us bring you this important publishing event.

Look for the January Design Awards issue of P/A. It’s the now issue of the now magazine in architecture.

PROGRESSIVE ARCHITECTURE
Light, natural or man-made, affects man in his every environment, outside or inside, comforting or hostile. To deal with light, to shape it, direct it and utilize it, to meet the needs of man is what we do. To Sunbeam, our product is the tool which allows the architect and designer to create the proper atmosphere for working and living, whether that tool is a single fixture or an entire system of illumination and air control. As a contribution to the architectural community, Sunbeam Lighting is preparing a series of booklets entitled Light in the Human Environment, written by authorities of various disciplines...art, psychology, anthropology, behavioral science, human engineering and the social sciences. The first in this series, ...as the artist sees it, is available free of charge or obligation merely by writing David T. Traitel, President, Sunbeam Lighting, 777 East 14th Place, Los Angeles, California 90021. On your letterhead, please.
KINETIC ARCHITECTURE
By William Zuk and Roger H. Clark
Bold, exciting concepts to unfreeze architecture from the static, monument syndrome and make it more adaptive to changing modes of life. Fresh insights into pneumatic, hinged, folding spaces . . . buildings that expand, contract, even move . . . and many more innovations . . . with a wealth of supporting examples.
176 pages, 11 x 8 1/2, $14.95

ARCHITECTURAL INTERIOR SYSTEMS
Lighting, Air Conditioning, Acoustics
By John E. Flynn and Arthur W. Segil
Practical guidelines to choosing acoustical, air conditioning and lighting systems that best satisfy human sensory and behavioral needs. Coordinated with other building elements; ample photographs, diagrams and tables. Particularly useful if you work without an in-house interdisciplinary engineering staff.
320 pages, 6 x 9, $13.95

BUILDING CODE OF THE CITY OF NEW YORK
Brings you up to date with the latest good practice regulations, emphasizing performance standards (rather than specifications) that encourage greater flexibility for innovations and cost-saving provisions. Durable, small-book format with running heads for handy reference.
836 pages, 6 x 9, illustrated, $14.95

All three books now at your bookstore . . . or write VAN NOSTRAND REINHOLD CO.
450 West 33rd Street, New York, N.Y. 10001

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of October 23, 1962; Section 4369, Title 39, United States Code) of PROGRESSIVE ARCHITECTURE, published monthly at 600 Summer Street, Stamford, Connecticut 06904, for October 1, 1970.
6. The names and addresses of the publisher, editor and managing editor are: Publisher, Harrington A. Rose, 140 E. 28th St., New York, N.Y. 10016; Editor, Forrest Wilson, 721 Marshall Place, Plainfield, New Jersey 07060; Managing Editor, Rita Robison, 140 Hoyt St., Stamford, Conn. 06905.
8. The known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

<table>
<thead>
<tr>
<th>Average No. of Copies Each Issue During Preceding 12 Months</th>
<th>Actual Number Published Nearest to Filing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>68,444</td>
<td>68,083</td>
</tr>
</tbody>
</table>

I certify that the statements made by me above are correct and complete.

HARRINGTON A. ROSE
Publisher

International Sanitary Supply Association
Dept. PA, 5330 N. Elston Ave.
Chicago, Illinois 60606

Name
Title
Firm
Address
City  State  Zip
Area of Interest:  [ ] Commercial  [ ] Institutional  [ ] Industrial

On Reader Service Card, Circle No. 355

161
Interior or exterior, when the motif calls for a truly distinctive ceramic tile for walls or floors, specify "VALENCIA"... Latco's latest addition to the opulent world of fine design! Inexpensive, easy and economical to install, "Valencia" is 3"x3" in size, comes mounted on 13"x13" sheets. FOR COMPLETE SPECIFICATIONS, WRITE... Latco PRODUCTS 3371 Glendale Boulevard • Los Angeles, Calif. 90039 TELEPHONE: (213) 664-1171

FREE!

DEEP LONGSPAN STEEL JOIST SPECIFICATIONS

Depths from 52" to 72" Clear spans up to 144 feet.

A new help to structural designers... the first standard specifications for deep longspan joists—DLJ and DLH-Series... adopted by the Steel Joist Institute. Covers materials (36,000 psi and 50,000 psi), connections, camber, painting, application, bridging, erection—and all pertinent design information, including Standard Load Tables.

Send for your free copy today!
DRAW. OR RULE. LINES ARE SHARP AND CLEAR—NO FEATHERY EDGES.

ERASE. REDRAW AND RE-ERASE. ON AND ON. CREASE THE PAPER, TOO.

CHECK FOR GHOSTS.

CLEARPRINT INVITES YOU TO VERIFY A GHOST STORY

Seeing is believing. With this simple test you can see for yourself why leading engineers and architects demand Clearprint Technical Papers. Made from a 100% rag stock, they have a perfect working surface. Highest erasing qualities insure against ghosting. Clearprint doesn’t change. Its stability, strength, transparency and printing qualities remain unchanged even after extended exposure to age, atmosphere, heat, and light. If you aren’t using Clearprint now, try this comparative test on the paper you are using. Write for samples, sizes and prices.

CLEARPRINT PAPER CO.
1482-67th Street, Emeryville, California

☐ Send me Clearprint samples, with prices, for the following uses:

Name ____________________________

Firm ____________________________

Address ____________________________

City ____________________________ State ________ Zip ________
JOBMART
SITUATIONS OPEN

ARCHITECT—Key position for designer-planner for hospital and medical facilities. Should have in-depth background for responsible assignments. Daverman Associates Architects, Engineers, Planners, 200 Monroe, N.W., Grand Rapids, Michigan 49502.

ARCHITECT—Major midwest architectural, planning and engineering firm with a national practice has opening for architect, involving educational, institutional, industrial, and planning projects. Opportunity to work with qualified personnel in firm's interior position. Applicant must possess high professional standards and leadership capability. Moving expenses paid and liberal salary commensurate with qualifications. Send resume in confidence to Box No. 1361-134, PROGRESSIVE ARCHITECTURE.

ARCHITECT—Registered, Professional associate with firm building, staffing, bonus, retirement plan. Harold J. Weston & Associates, Downtown Airport, St. Paul, Minneapolis, Minn. 55158.

ARCHITECT OR ARCHIT. GRADUATE—Three years experience. Position open in small expanding office in Central Connecticut. Must have excellent drafting skills, producing drawings. Qualified man will work directly with clients and supervise construction. Send complete and salary history to Box #1361-156 PROGRESSIVE ARCHITECTURE.

ARCHITECTS—Facilities planning consultants. International planning and design consultants. Offices in New York City and London seek professionals whose primary responsibilities will concern research, planning and design of federal government facilities. Opportunities exist domestically and abroad. Experienced in institutional, commercial, motel-hotel, restaurant, and residential (custom and speculative) fields. Excellent opportunities for new construction and remodeling of private and public facilities. Send resume to: Mr. Franklin D. Guidone, Director, Our Buildings, Inc., 501 Madison Ave., New York, N.Y. 10022.

ARCHITECT—Immediate openings for career-minded professionals in our major architectural office in Dallas.LICENSE, registration and a minimum of five years experience in commercial design of retailing, warehousing, and shopping center facilities required, along with a degree and U.S. citizenship. Progressive office staffed with professionals who are master-planning and providing comprehensive design services for new construction and remodeling of our facilities worldwide. Also, opportunity for future growth to leadership within regional management centers in the U.S.A. or to our European or Far East offices. Starting salary $15,477; fringe benefits and opportunities for work on challenging projects are part of the package. MOBILITY is a requirement. You must be willing to relocate and accept occasional transfers, for we need mobile professionals. Your reply will be acknowledged with further information. Send résumé and background information on projects for the supervising architect. Work in this office is qualifying experience for licensing, and presents a broad exposure to architectural problems. To qualify you'll need a degree in architecture, four years' experience, progressively responsible design, drafting, or interior design experience in a large retail organization with a professional firm. Mobility is a REQUIREMENT. You must be willing to relocate throughout the U.S.A. and overseas and accept occasional transfers. We have a great opportunity where administration, with excellent opportunity for advancement. Your reply will be acknowledged within a few days. Those applicants whose qualifications match closely our requirements will be contacted for personal interviews within the next two weeks. To APPLY, Rush Your Resume, including salary history to: Mr. Clif Miehaffey, Dept. ED-11, Army Air Force Exchange Service, 3911 Walton Walker Blvd., Dallas, Texas 75222. An equal opportunity employer.

PROJECT ARCHITECT—Expanding architectural/engineering firm has openings for project designers and draftsmen. Located in Western New York. Must be familiar with governmental agency work. Salaries in line with experience. Send resume to Box #1361-156 PROGRESSIVE ARCHITECTURE.

ARCHITECT—Expanding architectural/engineering firm seeking assistant project architect for position in plan which will be mutually beneficial. Especially desirable at this time are young firms of two or three years experience and eager to grow fast. Send resume including salary requirements to: Mr. Franklin D. Guidone, AIA, Director of Design, The Cannon Partnership, 2637 Main Street, Niagara Falls, New York 14305.

SMALL OFFICE ARCHITECTS—Small office architects for position. Send resume to: George A. Rubel, 2130 Broadway, New York, N.Y. 10023.

WANTED—Three designers—Draftsmen with 3 to 5 years experience on board. Must be U.S. citizen. Medium size office located where there is hunting, fishing, and skiing. Send resume with date available and salary desired to Richard B. Diamond, Diamond & Aldrich, Architects, 719 Union Street, Bennington, Vermont.

BACKGROUND CHECKS—To be made on all applicants. Address your resume to: Mr. Charles C. Capuano, Jr., 1170 Broadway, New York, N.Y. 10013.

SITUATIONS WANTED

ARCHITECT—Free lancer, M.S. in architecture. Eight years heavy experience in architectural and interior working drawing and representation drawing production. Seek free lance work doing same in New York City area. Address: Box #1361-158 PROGRESSIVE ARCHITECTURE.

ARCHITECT—Liaison—Architect in private practice in midwest commuting to central Europe on regular basis to visit family. Desires to act as liaison or assist in international business for offices with work in midwest, south, and central Europe. Address: Box #1361-159 PROGRESSIVE ARCHITECTURE.

EXECUTIVE ARCHITECT—AIA, NCARB, registered in 14 states. Age 42. Currently managing, supervising, designing commercial, industrial, agricultural, and governmental projects. Experienced in institutional, commercial, motel-hotel, restaurant, and residential (custom and speculative) fields. Experienced in project development and exposure of private practice from promotion to construction. Variated project cost range. Familiar with governmental agencies, policies and procedures. Substantial travel experience domestically and abroad. Seeking position on partnership or participation basis, with equal opportunity where administration, consultation and technical ability may be utilized. Tentational in contemporary design oriented. Address: Box #1361-160 PROGRESSIVE ARCHITECTURE.

INTERIOR DESIGNER—NSID, BS Design, young lady, single, 10 years experience from concept to completion in commercial, institutional, and residential projects. Seeking responsible position requiring comprehensive abilities—all phases design, client contact, administrative, and detail skills. Presently in midwest, but will relocate. Box #1361-161 PROGRESSIVE ARCHITECTURE.

MISCELLANEOUS


EDWARDS & SHEPARD, INC.—We are a design and architectural placement service utilizing our unique background and experience to appraise the qualifications, experience and effectiveness of design and architectural personnel from recent graduates through administrators of large regional or national firms, or opportunity where administration, consultation and technical ability may be utilized. Tentational in contemporary design oriented. Send personal interview and portfolio review. Our offices are located where there is plenty of hunting, fishing and skiing. Send resume with date of availability to Box #1361-160 PROGRESSIVE ARCHITECTURE.

Advertising Rates

Standard charge for each unit is Fifteen Dollars, with a maximum of 50 words. In commercial advertising (firm name and address) counts as five words, a box number as six words. Articles may be purchased for thirty dollars, with a maximum of 100 words. Advertisers should accompany advertisement and be mailed to Job Mart, 375 Park Avenue, New York, N.Y. 10022.

Submission to Job Mart is acceptance of insertion, including title and classification, to be held for thirty days from publication. Box number replies should be addressed as noted above with the box number placed in lower left hand corner of envelope.

Fire Retardant Novoply is applauded by the toughest committee in the city.

Fire fighters are highly enthusiastic about Fire Retardant Novoply. Which figures. It rates as a Class I (or Class A) material under the major building codes, having been listed and labeled by Underwriters' Laboratories, Inc., with a flame-spread rating of 25.

Fire Retardant Novoply is a true 3-ply particleboard developed expressly to meet building code requirements for fire-retardant materials. It can be used as core stock under wood veneers and plastic laminates, or as a paint grade panel any place you want a flat stable panel with excellent fire retardance.

Contact your nearest U.S. Plywood branch. Ask the Architectural Service Representative about Fire Retardant Novoply. Or write to U.S. Plywood, Dept. PA 10-9, 777 Third Ave., N.Y., N.Y. The more you specify, the happier you'll make the fire fighters in your area.

On Reader Service Card, Circle No. 377
**DIRECTORY OF PRODUCT ADVERTISERS**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>P/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcan Aluminum Corp., Building Prod. Div.</td>
<td>10</td>
</tr>
<tr>
<td>Bally Case &amp; Cooler Co., Inc.</td>
<td>143</td>
</tr>
<tr>
<td>Bethlehem Steel Corporation</td>
<td>154,155</td>
</tr>
<tr>
<td>Blum, Julius &amp; Company, Inc.</td>
<td>129</td>
</tr>
<tr>
<td>Bobrick Dispensers, Inc.</td>
<td>112</td>
</tr>
<tr>
<td>Burke Rubber Company</td>
<td>16Wa</td>
</tr>
<tr>
<td>Carpenter, L.E. &amp; Co., Inc.</td>
<td>150</td>
</tr>
<tr>
<td>Cast Iron Soil Pipe Institute</td>
<td>150</td>
</tr>
<tr>
<td>CF &amp; I Steel Corporation</td>
<td>38</td>
</tr>
<tr>
<td>Checkmate, Division of Rixson Co.</td>
<td>41</td>
</tr>
<tr>
<td>Chromalox Comfort Conditioning Div., Emerson Electric Co.</td>
<td>16</td>
</tr>
<tr>
<td>Clearprint Paper Company</td>
<td>163</td>
</tr>
<tr>
<td>Collins &amp; Alkman</td>
<td>146</td>
</tr>
<tr>
<td>Concrete Reinforcing Steel Institute</td>
<td>8,9</td>
</tr>
<tr>
<td>Conwed Corporation</td>
<td>151,152</td>
</tr>
<tr>
<td>Customwood Filigree Mfg. Co.</td>
<td>140</td>
</tr>
<tr>
<td>Delta Faucets — Masco Corp.</td>
<td>168</td>
</tr>
<tr>
<td>Edgar Pencil Company</td>
<td>37</td>
</tr>
<tr>
<td>Edicson Electric Institute</td>
<td>42,43</td>
</tr>
<tr>
<td>Emory Fibers &amp; Laminites Co., Div. of Enjay Chemical Corp.</td>
<td>119</td>
</tr>
<tr>
<td>Fabrovin, Architectural Prod. Div., Duct Industries, Inc.</td>
<td>12,13</td>
</tr>
<tr>
<td>Fife, Richard, Inc.</td>
<td>38</td>
</tr>
<tr>
<td>Formica Corporation</td>
<td>123</td>
</tr>
<tr>
<td>Gaco Western, Inc.</td>
<td>16Wf,16Wg</td>
</tr>
<tr>
<td>Gates Engineering, Div. of SCM Corp.</td>
<td>140</td>
</tr>
<tr>
<td>Glidden Durkee Division of SCM Corp.</td>
<td>17</td>
</tr>
<tr>
<td>Grace, W.R. Company, Construction Prod. Div.</td>
<td>62</td>
</tr>
<tr>
<td>Grafo, Inc.</td>
<td>14,15</td>
</tr>
<tr>
<td>Harter Corporation</td>
<td>142</td>
</tr>
<tr>
<td>Hercules, Inc.</td>
<td>127</td>
</tr>
<tr>
<td>Hickman, W.P. Company, Inc.</td>
<td>38</td>
</tr>
<tr>
<td>Inland-Ryerson Construction Prod. Co.</td>
<td>16We</td>
</tr>
<tr>
<td>International Sanitary Supply Assn.</td>
<td>161</td>
</tr>
<tr>
<td>Jennison-Wright Corporation</td>
<td>136</td>
</tr>
<tr>
<td>Jute Carpet Backing Council, Inc.</td>
<td>135</td>
</tr>
<tr>
<td>Kentile Floors, Inc.</td>
<td>4th Cover</td>
</tr>
<tr>
<td>Kinnear Corporation</td>
<td>1</td>
</tr>
<tr>
<td>Knoll International</td>
<td>57</td>
</tr>
<tr>
<td>Koppers Company, Inc.</td>
<td>131 thru 134</td>
</tr>
<tr>
<td>Latco Products</td>
<td>162</td>
</tr>
<tr>
<td>Lead Industries Association, Inc.</td>
<td>128</td>
</tr>
<tr>
<td>Lightolier</td>
<td>148,149</td>
</tr>
<tr>
<td>Master Builders</td>
<td>30</td>
</tr>
<tr>
<td>McPhilen Lighting-Emerson Electric</td>
<td>121</td>
</tr>
<tr>
<td>Norton Plastics &amp; Synthetics Div.</td>
<td>138</td>
</tr>
<tr>
<td>Ojo Graphics</td>
<td>3</td>
</tr>
<tr>
<td>Pall Realscreen</td>
<td>35,36</td>
</tr>
<tr>
<td>Pomaona Tile Co.</td>
<td>11</td>
</tr>
<tr>
<td>PPG Industries, Inc.</td>
<td>47 thru 54</td>
</tr>
<tr>
<td>Progressive Architecture</td>
<td>158,159,161</td>
</tr>
<tr>
<td>Red Cedar Shingle &amp; Handrail</td>
<td>144,145</td>
</tr>
<tr>
<td>St. Regis Paper Co., Forest Products</td>
<td>137</td>
</tr>
<tr>
<td>Sargent &amp; Company</td>
<td>61</td>
</tr>
<tr>
<td>Sloan Valve Company</td>
<td>115</td>
</tr>
<tr>
<td>Southern California Edison Company</td>
<td>16Wb,16Wc</td>
</tr>
<tr>
<td>Stanley Hardware Div. of the Stanley Hardware Co.</td>
<td>153</td>
</tr>
<tr>
<td>Steelcraft Manufacturing Co.</td>
<td>142</td>
</tr>
<tr>
<td>Steel Joist Institute</td>
<td>162</td>
</tr>
<tr>
<td>Sunbeam Lighting Company</td>
<td>160</td>
</tr>
<tr>
<td>Tarten Corporation</td>
<td>117</td>
</tr>
<tr>
<td>Tatnall Company</td>
<td>117</td>
</tr>
</tbody>
</table>

**NOVEMBER 1970**
Mother Nature goes to a lot of trouble to develop a strong, mature, richly-grained wood of natural beauty. Then we take it and manicure it slightly to provide you with real hardwood planks of random widths and lengths, tongue and groove each plank for the simplest installation, and just to protect its natural beauty, we apply a special factory pre-finish of baked-on acrylic. And if that’s not enough, we make it available to you in twelve rich hardwoods in Colonial, Select, or Rough Sawn grades. You get real hardwood planks—not simulated wood panels. The real thing.

That’s why we call ours the “honest” wood.

Please send me the name of your nearest Townsend distributor

Name:

I would like additional information

Phone:

Firm:

Title:

Address:

City:

State.

Zip.

Townsend Inc.
P. O. Box 916 • Stuttgart, Arkansas 72160
On Reader Service Card, Circle No. 375

ADVERTISING SALES OFFICES

Progressive Architecture

William F. Bondlow, Jr., Advertising Sales Manager

400 Summer Street 203-348-7531

District Managers

Michael J. Hanley

John P. Mertens

Philadelphia, Pa. 19107:

12 So. 12th Street 215-922-0346

District Manager

John A. Teefy

Pittsburgh, Pa. 15219:

601 Grant Street 412-281-9421

District Manager

Albert E. McClimens

Chicago, Ill. 60603:

10 So. LaSalle Street 312-726-1282

District Managers

Charles E. Durham, Jr.

James J. Hoverman

Cleveland, Ohio 44114:

1717 E. 9th Street 216-771-4011-12-13

District Manager

John F. Kelly

San Francisco, Cal. 94104:

Jobson, Jordan, Harrison & Schulz, Inc.

57 Post Street 415-392-6794

Representatives

Charles S. Harrison

Cyril B. Jobson

Los Angeles, Cal. 90057:

Jobson, Jordan, Harrison & Schulz, Inc.

1901 W. 8th Street 213-483-8530

Representatives

Kenneth E. Jordan

Peter Schulz

Atlanta, Ga. 30308:

Robert L. Watkins Associates

505-605 Peachtree Bldg. 404-874-6427

Representative

Harmon L. Proctor

Tokyo, Japan:

International Media Representatives, Ltd.

2-4, 6-Chome Akasaka, Minatoku

Representative

Sumio Oka
The new Delta Fjord two-handled single handle valve is so easy to install, you could almost do it single handed.

What more could a profit-minded businessman ask for?
We've designed the Delta Fjord with a flexible attachment for easy installation. And you can spread our widespread anywhere from 6 to 16 inches. Making the Delta Fjord versatile enough to fit virtually any lavatory.

But don't ignore our new valve's looks. We've designed the Delta Fjord with today's fashion-conscious housewife in mind. In decorator finishes of chrome, brushed chrome, bright gold or satin gold. In models for the tub, shower and lavatory.

And we haven't forgotten our original concept of one moving part for maintenance-free service. What could be better? A faucet housewives will be crying to have installed... and not sobbing to you about return calls for adjustments.

"I'll be plugging Delta faucets regularly on my CBS radio show."

DELTA
Div. of Masco Corp., Greensburg, Ind.
In Canada:
Delta Faucet of Canada, Ltd.,
Rexdale, Ontario