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DETAIL—VILLA BORGHESE, ROME

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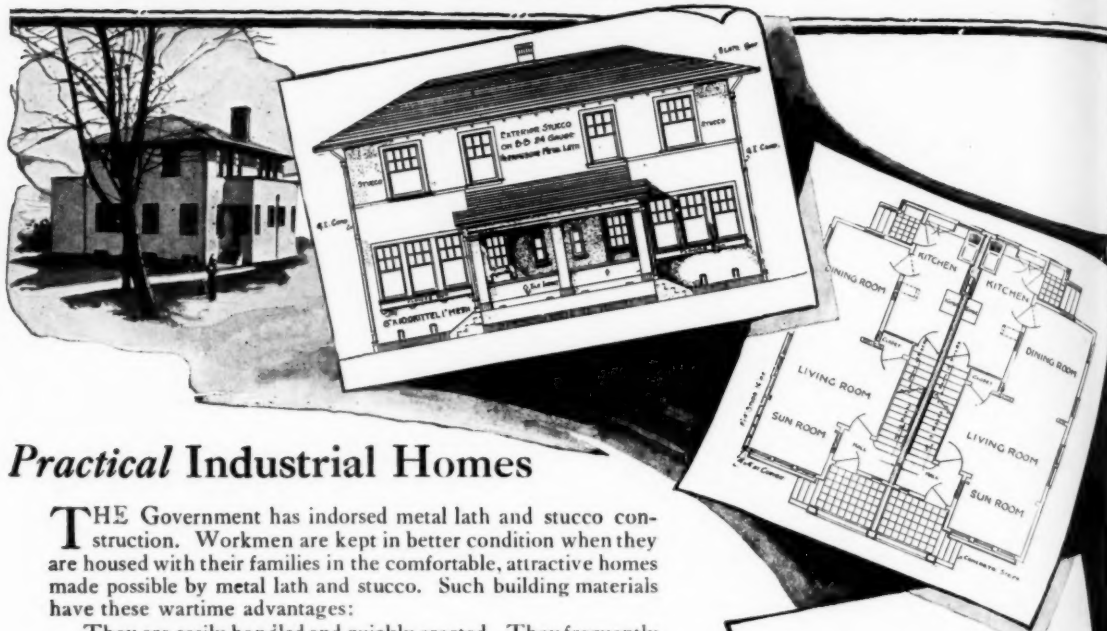
VOLUME CXIV

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THE illustrations show a practical way of solving the wartime industrial housing problem. We have selected for an example a workman's home in Youngstown, Ohio. A miniature reproduction of the completed house is shown, also front elevation, first floor plan and section through building. This is the no-sheathing type of metal lath and stucco construction. Herringbone Rigid Metal Lath was applied directly to the studs, plastered on the outside and then back-plastered so as to cover fully and imbed the lath.



Practical Industrial Homes

THE Government has indorsed metal lath and stucco construction. Workmen are kept in better condition when they are housed with their families in the comfortable, attractive homes made possible by metal lath and stucco. Such building materials have these wartime advantages:

They are easily handled and quickly erected. They frequently can be found on the job or close to point of building.

When shipped by freight, the saving of car space (metal lath for a given job requires much less space than other materials) is a valuable consideration.

Any high-grade metal lath makes safe and permanent outside stucco walls or inside plaster walls, and ceilings. But Herringbone Rigid Metal Lath is especially desirable because of its exceptional rigidity, due to the heavy longitudinal ribs set at an angle of 45 degrees to the plane of the lath.

The Herringbone clinches the plaster and the plaster clinches the Herringbone in an unbreakable grip. Herringbone industrial homes are cool in summer, warm in winter; fire-safe; mice, vermin, moisture and decay proof.

Herringbone industrial homes are comparatively economical to build and most economical in the end, because repair and repainting bills are practically eliminated. These houses are not built overnight to fall apart in a year. They can be rapidly erected, but they will last through many generations.

Because of its facilities for distributing metal lath in all principal centers, The General Fireproofing Company is in an unusually favorable position to serve the builders of industrial homes. We shall gladly furnish complete information and give every possible assistance to architects and engineers interested in this type of construction. Write:



Trade Mark
Reg. U. S. Pat. Off.

The General Fireproofing Co., Youngstown, Ohio

Manufacturers of Metal Lath, Concrete
Reinforcements, and Waterproofings

Members of Associated Metal Lath Manufacturers

Branches in Principal Cities

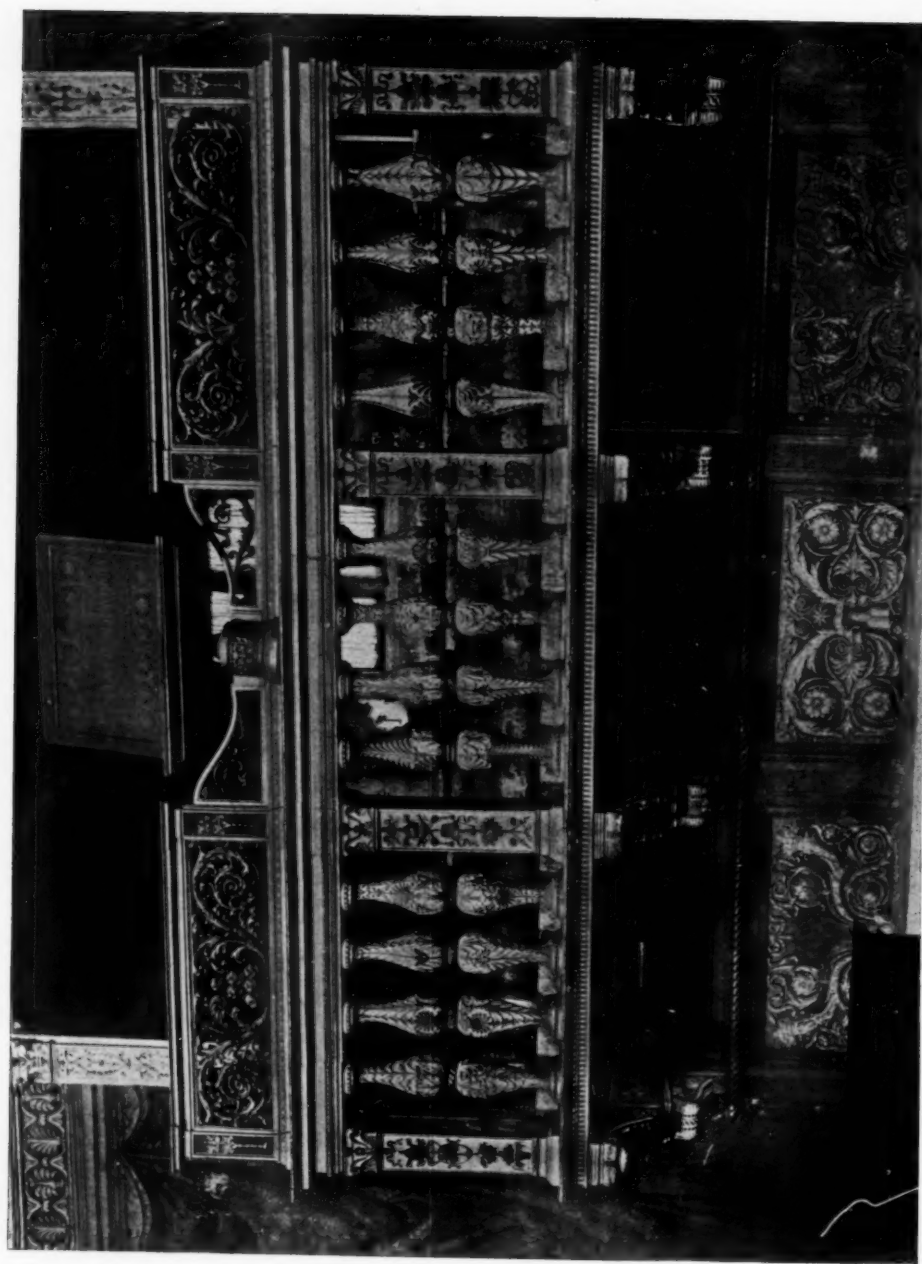
The GF Industrial Housing Book will be sent free to any interested architect, engineer or contractor on request. To others, upon remittance of \$1.00.



Herringbone

RIGID METAL LATH





CHOIR GALLERY, SISTINE CHAPEL, ROME

THE AMERICAN ARCHITECT

VOL. CXIV

WEDNESDAY, AUGUST 7, 1918

NUMBER 2224



ON WARWICK COUNTY ROAD

Government Industrial Housing a Business Proposition

DURING the last two years, because of war costs and war uncertainties, the building of workmen's houses has been almost at a standstill in this country. This would of itself have caused a widespread, though not acute, housing shortage. It is true that there has been at the same time a great shifting of the population, which would tend to offset this effect. Our young men have been taken out of their home-towns and sent to war, resulting in a lessening, equal throughout the country, of the pressure on existing housing; and a lessening of the demand for new houses for those families of the future which normally would now have been setting up their own homes.

But there has been another movement, far over-

balancing the first where it has occurred: the concentrating of much of the free labor of the country into those localities where intensive war work is being carried on. We are all familiar with accounts of the aggravated housing shortage which this has so frequently caused; we read how two or even three men use the same bed in consecutive shifts, how stables, sheds, any and every kind of shelter is pressed into service.

There is plenty of demand for workers at other things than war work; and it is no wonder that a self-respecting man, particularly a man with a family to protect, with children to educate, will choose to work at a "non-essential" industry, where places are left open by those who have gone to the front, rather than, even for high pay or for

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PROGRESS PHOTOGRAPHS, TYPES F-1, KK-1, FF-3 AND E-2

motives of patriotism, to subject his family and himself to uncomfortable, unattractive, and often unsanitary living conditions.

And even where a man, usually an unmarried man, does choose war work under these conditions and stays on his job, his efficiency is cut down. Not only is he physically below par through lack of proper cleanliness, rest, and recreation, but his pride, his good nature, his willingness to co-operate, are hurt by the implied slight of being asked to live in such surroundings.

Now, purely as a cold business proposition, from the point of view of the production of goods, these

qualities, of bodily and mental cleanliness and the normal life of the worker, are an essential part of the equipment of an industrial plant. They are in the same category with the tools and the materials with which the goods are made. Proper arrangements to produce and maintain them are a legitimate part of cost of production.

Until a short time ago the private manufacturer has been able to shift this expense item onto the shoulders of the town. The workers were paid, and supposed to be able to get for themselves such living facilities as they needed. But it is very seldom that a working man builds his own house in



REAR VIEW OF ABOVE HOUSES

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accordance with his own ideas. He buys a house, or rents it, and has to take what the market affords. And, under the pressure of competition, the real estate man and the speculative builder usually put into the market whatever brings the most profit, not what most permanently contents the householder. The usual house for sale represents the desires rather of the seller than of the buyer. Thus, even before the war, this go-as-you-please expedient often proved a failure. A number of indus-

heartbreaking delays begun to appropriate Government money to provide—among other things—necessary housing for war workers in munition plants and shipyards.

It is evident that this money will be spent efficiently only if it induces the workers to live in the houses and to do their work. The end product of this housing activity is the contented, efficient worker; and—of course without waste, without an unnecessary expenditure of any kind—everything



PROGRESS PHOTOGRAPHS OF HOUSES, TYPES E-1 and B-1

trial plants themselves undertook housing for their workers, as a necessary business procedure to "stabilize their labor." These, too, were not always successful, again largely because they represented, or were thought to represent, only one side of the business interests concerned—that of the employer, not that of the employee.

The present war has put this problem forcibly before us in its entirety. In the case of munitions of war and of ships, it is we, the people of the United States, who are investing the money, who are furnishing the labor, and who are vitally concerned, in profit, safety, and honor, in the rapidity and amount of production.

We are at the beginning of the problem; we have not solved it, but we have at last and after

as to living conditions essential to making and keeping the worker contented and efficient is a legitimate item in the list of costs.

For the unmarried man, who takes up the war work for the high wages, for the adventure, for patriotism, or to be concerned in something big and important, efficient living conditions may consist, for a time, in nothing more than a clean and decent room, a chance for a bath, a chance for rest and recreation.

For the married man with a family, and for every person in the long run, efficient living conditions comprise all those things which we recognize as necessary to a complete town: not only proper houses properly located and arranged, but roads, water, sewerage, fire protection, stores, markets,

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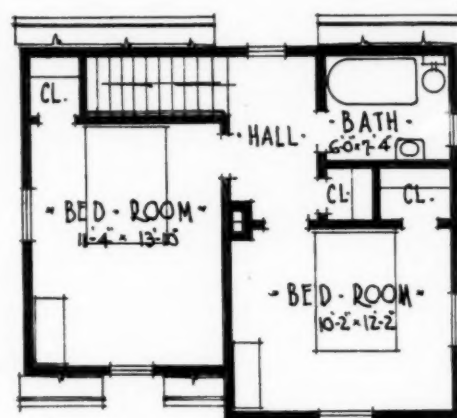
churches, schools, theaters, clubhouses, parks, playgrounds, playfields, and so on; and any Government industrial housing development which does not find all these things already sufficiently provided to cover its needs must provide them itself, and if necessary pay for them itself, and, moreover, all these things must be provided, and administered, in such a way that the people using them shall do so with self respect and as their well-earned right. Americans will not live contentedly in a housing development that looks like a toy village or a state poor farm. Nor will they live contentedly under legal restrictions of tenure and occupancy that encroach too much on their personal freedom, or that express too much the interest of anyone but themselves.

Temporary housing may sufficiently serve the careless bachelor; incomplete living facilities may, for the time, serve those who have known no better and who can afford no other; but for the trained and well paid man, permanence as well as decency will be necessary. And we must remember that it is the discontented whom we are trying to content, and a high proportion of the discontented will, of course, be those who recognize and mean to obtain really good and permanent living conditions.

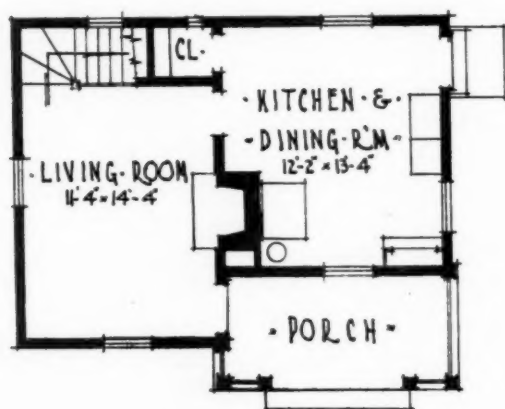
Moreover, the world will not come to an end when the war is over. It will be just as vital, and perhaps just as obviously vital, that workers shall be contented after the war as now. Permanent housing may take its place as an integral part of the

age its replacing the munitions plant then happily out of work.

But the temporary housing after the war is little better than "scrap"; indeed, it may be much worse, and, not being destroyed, degenerate into a slum as



SECOND FLOOR PLAN
TWO-ROOM HOUSE, TYPE C-1



FIRST FLOOR PLAN
FOUR-ROOM HOUSE, TYPE C-1

enlarged and improved town, and as something rather better than what was done before, to stimulate further housing improvement. Much of its value remains after the war, even if perhaps some other industry has to receive a subsidy to encour-

bad as any now existing, a destroyer of local land-values, a menace to the tenant and a reproach to the country.

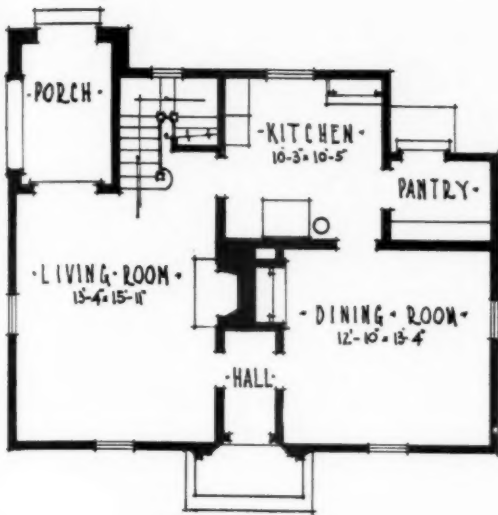
All this, then, is what we must face, as a matter of business, in undertaking government housing. It is possible to state each particular housing problem roughly in business terms. Let us take, for example, the government housing development now under way at "Hilton," near Newport News, Va.

The Newport News Shipbuilding and Dry Dock Company as long ago as October, 1917, saw that government assistance in war housing developments would be absolutely essential and, therefore, would some time be provided.

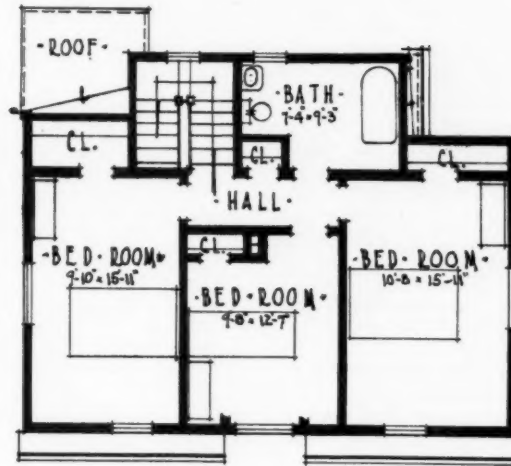
They employed Mr. H. V. Hubbard of the firm of Pray, Hubbard & White, as landscape architect, and Mr. F. H. Bulot as engineer, to prepare a scheme for the development of land for 500 houses to serve the shipyard workers, and Mr. Francis Y. Joannes was engaged as architect. They hoped, as proved to be the case, that when government loans for such work finally became available they would have their plans so far along that they might be accepted without great changes and quickly put under construction.

This co-operation of architect, engineer and landscape architect and town planner is an ideal one, reflecting, as it does, the three great requirements of any such development: beauty and utility of houses and public buildings; adaptation of public utilities to use, to local conditions and to considera-

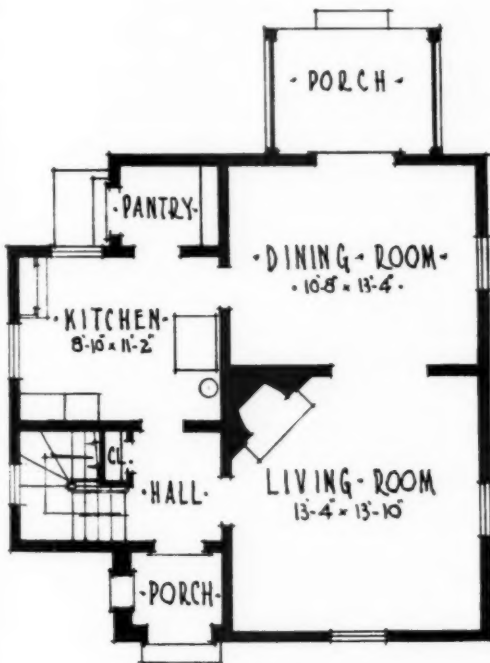
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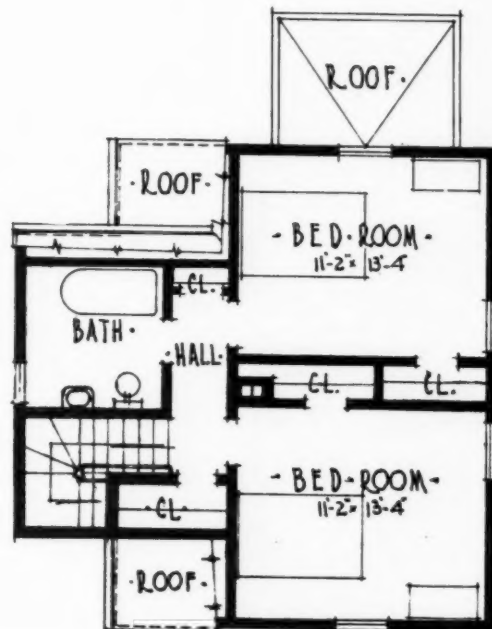
FIRST FLOOR PLAN
SIX-ROOM HOUSE, TYPE L-1



SECOND FLOOR PLAN
SIX-ROOM HOUSE, TYPE L-1



FIRST FLOOR PLAN
FIVE-ROOM HOUSE, TYPE A-1



SECOND FLOOR PLAN
FIVE-ROOM HOUSE, TYPE A-1

HILTON VILLAGE

An Industrial Housing Development for the Newport News, Va., Shipbuilding & Drydock Co.

FRANCIS Y. JOANNES, ARCHITECT

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tion of economy; and beauty of ground adaptation to topography and to the life and growth of the community.

The piece of land chosen was the nearest to the shipyards which could be obtained, of sufficient size and quality. The taking up of land for other governmental purposes forced the site for Hilton,

was possible to make a reasonable estimate of what such a house would cost.

Having, on the basis of all the local conditions, and the known preferences of the workers as to lot sizes, and so on, worked out a tentative plan for the new town, it was possible to estimate roughly what would be the cost of this town, "complete and ready to serve"; and by much laborious fitting and changing it seemed to be possible, in this case, to evolve a plan which would produce the necessary accommodations for the possible price, without being obliged to sacrifice decency, permanency, convenience, space, sanitation, nor some noticeable degree of beauty. There is a minimum figure below which it is not economy to reduce cost per cubic foot for a house. There is a still more irreducible minimum in water supply and sewerage. Roads, however, may sometimes be opened but not paved, parks may be set aside but not developed, thus quite justly postponing until later



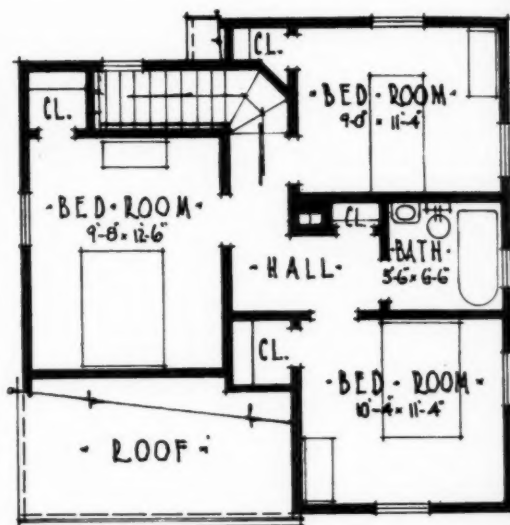
FIRST FLOOR PLAN
SIX-ROOM HOUSE, TYPE E-1

about three miles from the shipyards, but both present railroad service and proposed trolley service make it reasonably accessible.

Its cost, for the amount needed for lots, streets, school sites, church sites, store sites, park, playgrounds and playfield was the first item in the calculations.

The payrolls of the shipyard were put at the disposal of the designers, and reckoning that the normal rent of a house is about 20 per cent of the wage of one adult male worker, we had for each class of workers what they could pay as rent and, consequently, what sum could be expended for lot, improvements and house complete with all incidental expenses, so that the rent which a worker could afford to pay would be a fair return, say 10 per cent, on the investment in each case. This tentative lump sum price was item two.

Having determined, by careful investigation among the workers and consultation with them, and especially with their wives, over tentative plans, what sizes and kinds of houses they preferred, it



SECOND FLOOR PLAN
SIX-ROOM HOUSE, TYPE E-1

times the payment for some of the things which are to be enjoyed by later generations.

The land chosen is practically flat from the railroad to a short distance from the water. Along the shore it is broken by the steep-sided valleys of the two little brooks shown on the plan. The scheme is a modified gridiron, based on a main axis from the town square on the main highway to the community building on the little hill between the brooks, looking out across the James River. The minor streets, running parallel to the shore, some

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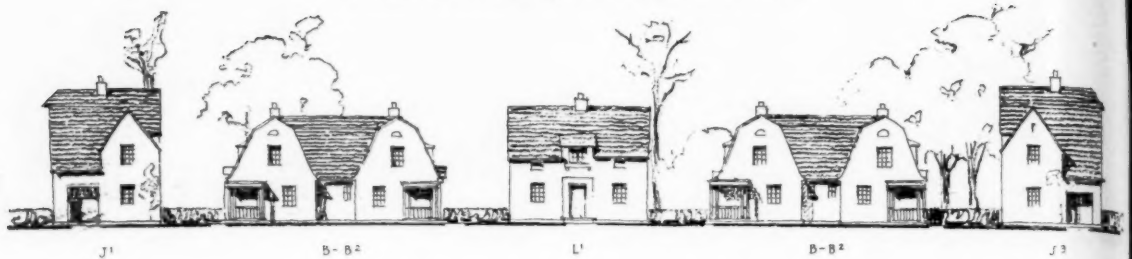
Typical Earnings of Employees

COMPILED BY JOSEPH D. LELAND, 3D

Approximate number employed.....	23	15	21	203	23	346	27	209	130
Classification.....	Angle-smiths	Boiler-makers	Copper-smiths	Fitters	Moulders	Machinists Includes: Brass, Iron and Outside Machinists	Pattern Makers	Riveters (Leading Men), Chippers and Caulkers, Tank Testers	Ship Carpenters
Normal hours.....	48 hrs.	48 hrs.	48 hrs.	48 hrs.	48 hrs.	48 hrs.	48 hrs.	48 hrs.	48 hrs.
Overtime at 1½ rate...	9 hrs.	9 hrs.	9 hrs.	9 hrs.	9 hrs.	9 hrs.	9 hrs.	9 hrs.	9 hrs.
Average rate per hour for 48-hour week....	.5186	.5704	.62	.4620	.6301	.5896	.6829	.5675	.5508
Average rate per hour for overtime.....	.6779	.8555	.94	.6930	.9452	.8845	1.0243	.8512	.8262
Normal 48-hour week wage.....	24.90	27.37	29.95	22.18	30.24	28.30	32.78	27.24	26.44
Present 57-hour week wage.....	30.90	35.08	38.38	28.42	38.74	36.25	42.00	34.90	33.88
Normal month wage...	96.91	118.61	129.79	96.10	131.05	122.62	142.06	118.03	114.55
Present month wage...	133.21	151.99	162.20	123.13	167.86	157.09	182.00	151.21	146.80
Normal yearly wage...	1294.80	1423.34	1557.40	1153.15	1572.78	1471.39	1704.77	1416.48	1374.67
Present yearly wage....	1658.58	1823.95	1995.55	1477.63	2014.27	1885.10	2184.00	1814.59	1761.55
Normal monthly rent...	21.58	23.75	25.96	19.22	26.21	24.52	28.42	23.60	22.91
Present monthly rent...	27.65	30.40	33.26	24.62	33.58	31.42	36.40	30.24	29.36
Normal yearly rent....	258.96	284.66	311.62	230.63	314.56	294.28	340.96	283.25	274.90
Present yearly rent....	331.72	364.79	398.26	295.52	402.85	377.02	436.80	362.92	352.37
Total normal cost (house and land) on 10% basis.....	2589.60	2846.64	3116.16	2306.28	3145.50	2742.76	3409.56	2832.48	2748.96
Total present cost (house and land) on 10% basis.....	3317.16	3647.88	3982.56	2965.24	4028.52	3770.16	4368.00	3629.16	3523.68
Total normal cost (house and land) on 9% basis	2877.32	3162.92	3462.40	2562.40	3495.06	3269.74	3781.20	3147.19	3054.40
Total present cost (house and land) on 9% basis	3685.73	4053.20	4425.07	3293.60	4476.13	4189.07	4853.33	4032.06	3915.20
Total cost of house and land on 9% basis. Average 5 years' present and 10 years' normal wage.....	3146.78	3459.68	3783.28	2802.79	3822.08	3576.18	4138.57	3442.26	3364.80
Determined cost house and land on 9% basis, 5% less.....	2989.45	3286.70	3594.14	2661.40	3630.98	3754.98	3918.44	3270.16	3196.56

NOTE.—These figures are not now exactly accurate (June 12, 1918), but serve to show method of calculation. Wages in nearly all cases have been increased.

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carrying through to future development north and south, some capable of being dead ended, are treated with little neighborhood open spaces for interest and additional feeling of room. The railroad station faces on a little square of its own, connected directly with the town square. A community garage is next the railroad station square.

Two churches, an apartment house and the few stores surround "Hilton Square," and two more churches, with the community building, give importance to the river end of the broad central street.

The land next the river, divided into larger lots, is held to be used for houses by those who can afford to spend more than the average and who will probably buy and build for themselves. The park occupies the rough land in the brook bottom in front of the community building. The playfield occupies the land on the outskirts of the development next the railroad and south of "Station Square." Neither park nor playfield needs much expenditure at once. They are large enough to serve several times the population at present expected, and the future population may do its share of paying for their development.

In the most part the lots are 130 ft. deep, since many of the people want gardens. The streets are 50 ft. wide or 100 ft. wide, but the roadways, excepting Warwick County Road, are but 20 ft. and 24 ft. wide, because they are and should remain local streets, with no possible press of traffic.

As far as may be expressed in dollars and cents, and not in decency, amenity and content, the appended figures show both sides of the account; what the householders may reasonably be expected to pay for their homes, and what these homes may be reasonably expected to cost.

No man is so wise that his estimate in such matters may be trusted implicitly in these times. If, owing to the present great difficulties in construction, the cost is greater than reasonable rents will amortize, the difference must, in one way or another, be borne by the government and charged up to the cost of the war. We hope, however, that the cost of the whole project will be such that the householders can fairly bear it all, and eventually

feel that it is their town and that they made it. We believe that, in either case, the result will be some five hundred families of more or less contented, self-respecting citizens, which would be worth the money, even if in no other way did the town prove to be a business proposition.

COST OF DEVELOPMENT, "HILTON" VILLAGE SHIPBUILDING REALTY CORPORATION, NEWPORT NEWS, VIRGINIA

ESTIMATED MAY 3RD, 1918—500 FAMILIES

	Total Cost	Cost per House
<i>Clearing the Ground</i>		
20.2 acres @ \$300.00 + 50 acres @ \$200.00 =	\$16,000	\$32.00
<i>Grading</i>		
9,950 cu. yds. cut and replaced @ 60c =	5,970	11.94
<i>Roads</i>		
Broken stone roads, 5964 lin. ft. = 12,713 sq. yds. @ \$1.21 =	15,382	
Bituminous macadam roads, 16,953 sq. yds. @ \$1.76 =	29,837	
Concrete roads, 2,756 sq. yds. @ \$2.12 =	5,843	102.12
<i>Concrete Walks</i>		
Sidewalks, 130,350 sq. ft. = 14,484 sq. yds. @ \$2.18 =	31,574	
House walks, 137,500 sq. ft. = 15,266 sq. yds. @ \$2.00 =	30,531	124.21
<i>Curbs and Gutters (Combined)</i>		
9,368 sq. yds. concrete 6" thick @ \$2.19 =	\$20,515	
7,492 sq. yds. foundations 6" thick @ \$0.45 =	3,371	
	23,886	47.72
<i>Storm Drains</i>		
4,974 lin. ft. of pipe (all sizes)	\$7,606	
Drain inlets grates	928	
	8,534	17.07
<i>Sewers and Sewage Disposal</i>		
Mains, total cost	\$18,829	
Manholes (about)	3,500	
House drains	19,765	
Effluent to river	1,850	
Septic tank	4,860	
	48,804	97.60
<i>Street Lighting</i>	5,554	11.11
<i>House Lighting</i>	24,276	48.55*
<i>Water Supply</i>		
Mains—6", 8", 12"—14,763 lin. ft. =	\$26,535	
Valves and hydrants	2,800	
Services	16,000	
575 meters @ \$18.00	10,350	
Pumping station	7,800	
	63,485	126.57*

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Plants and Planting	4,000	8.00
Professional Services		
Landscape architect and engineer	12,000	24.00
Cost of Land		
Developed, acres	78.4	
Playfield, acres	5.23	
Park, acres	6.54	
Acres	90.17	78,542 157.00
Total	\$404,218	\$632.77

*Covered by annual payment; not included in price of lot.

HILTON VILLAGE

AVERAGE COST OF DEVELOPMENT PER FAMILY

Total cost of land and development, including 5.23 acres of playfield, 6.54 acres of park, school and community-building site, 4 church sites, extra large main sewer for future extension, extra large water pipes and pump for future extension	\$404,218
Total number of families housed, about	500
Total cost for land with all improvements,* average per family	\$632.77
Total cost of house, average per family	\$2600.00
Total government expenditure per family of 5 average, with 2 workers average	\$3,232.77

*Not including cost of water supply and house lighting which are met by annual payments.

HILTON VILLAGE

Having arrived at an arrangement of streets and blocks which promised a reasonable and economical result and an opportunity for placing a maximum number of dwellings without exceeding the preferred population per acre, the type, size and location of buildings and their effect upon lot sizes became the important considerations. A rough schedule of quantities of four, five, six, seven and eight-room houses was agreed upon and preliminary sketches were made for each of these types of houses. It was deemed desirable in order to avoid the "pill box" effect of a large group of small houses to introduce a certain number of two family houses in such a way as to solidify the general appearance of the village and endeavor to break up this inevitable effect. In laying out the houses the possibility of forming double houses by combining two singles was constantly borne in mind, but a peculiar local condition which required the placing of the chimney near the center of each dwelling

afforded an opportunity, not possible in the usual housing development, of combining single houses back to back as well as side to side, and some surprisingly interesting compositions resulted. This naturally afforded a means of increasing the number of types of houses without multiplying to an unreasonable degree the quantities of details and material sheets required for carrying out the work. In placing houses on the property plan it was found that the plans of practically all single houses would have to be reversed, thus creating again a number of new types.

The lot subdivisions were not completely determined until after the plans of the houses had been settled and, where crowding could not be avoided otherwise, the type of house was changed so as to maintain the established minimum spacing of sixteen feet between houses having the same setbacks from the street.

The exterior character of the houses was determined in the early stage of the work on a basis of permanency and upkeep and the resulting schedule of exterior treatment shows a preponderance of stucco, with a smaller percentage of houses of siding or shingles. All of the houses will have slate roofs. As the climate does not make furnace heat necessary, no cellars are provided, but in order to take care of wood and coal supplies and garden tools a small outbuilding is provided for each family. In order, again, to avoid the dotting of the landscape with what might appear to be small dog houses these are combined wherever they can be in twos, threes and fours, thereby improving the general appearance, with a resulting economy in construction. These outbuildings are made large enough to accommodate a small motor car should the occupant of the house be the fortunate possessor of a "flivver."

The contractor for the construction work was selected early and a sufficient number of estimates were made of the cost of the various types of houses. By comparing these costs with the wage schedule of the prospective tenants it was found that the range of rents or sale prices were safely within the amounts which the different types of skilled labor could afford. There was no adequate

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provision, however, for the low-price white semi-skilled mechanic or young apprentice, married but with few or no children. It was therefore determined to place a row or terrace type of house along the Warwick County Road, which is an improved thoroughfare probably less desirable for the better type of development. These row houses are four rooms each, a combination kitchen and dining-room being provided. The end houses of each row, however, are five and six-room houses, affording a better architectural termination and a further variation in accommodation. This accomplished a further result of again solidifying the appearance of the village, particularly in its aspect to one passing through it on Warwick County Road. At the village green or square there are allotments for twenty stores having small apartments in the second story. Provision is also made in the store groups for a moving picture theater, billiard hall and bowling alley, and a hall for lodge meetings, religious meetings, theatricals and other community activities. Four lots have been set aside for churches, and these will be assigned to the denominations who may require them, the financing and building of these being left largely to the community. Provision is made for a grade school which has combined with it a meeting room, gymnasium, and domestic science room.

Because of the fact that the major part of the passenger transportation will be furnished by the extension of the Newport News trolley service, nothing more than a substantial shelter will be constructed for the railway station in connection with the Booster Station for water service until such time as traffic demands develop.

In preparing working drawings and details it was determined to place all of the plans and elevations of each type of house on one sheet and all of the details in connection with each type of single sheet so that a workman could be given a single sheet of each containing all the information he required to construct the house and not be hampered by the loss of separate plans or elevations from "sets" of prints prepared in the usual way. A single specification covers the work on all dwellings. The dimensions of all dwellings are based on market sizes of framing lumber, the story heights being established on the basis of 16-ft. studs cut 8 ft. 5 in. and 7 ft. 7 in. This cut of studding would not have been an

economical one except for a wholesale operation such as this. The contractor has practically established a "pre-cut" house proposition on the site, all joists, studding and framing being cut to lengths properly piled and issued as required in accordance with material schedules for each house. The bulk of the material has been ordered by the Construction Division of the Army on bills of materials furnished by the contractor. For certain items orders have been placed directly by the owners as agents of the United States. Considerable saving has resulted and the delivery of materials has been greatly expedited.

Preliminary drawings and studies were begun on December 24th and actual construction work began early in May. All matters pertaining to design were supervised until the middle of April by the Committee on Industrial Housing, Council of National Defense (afterwards the Housing Bureau, Department of Labor). Since that time the supervision for the Government has been cared for by the Housing Division of the United States Shipping Board. Thus the development has been through the organization stages of two Government bureaus.

APARTMENTS

Another development which is also under construction and bears an important relation to the village development, consists of four apartment buildings, 100 x 200 ft., four stories high, of the open-stair tenement type, each building containing eighty-four apartments of two, three and four rooms each. These are being erected within the city limits near the shipyard and form a very important adjunct to the village development in that they provide immediate quarters, on a rental basis, for new workers who might not be able to take a house and furnish it before knowing that they were going to remain. A place is also provided for the young married mechanic who can set up housekeeping in two or three rooms and later when his family grows he will naturally gravitate to the village for larger quarters and surroundings. Floaters are also taken care of, and as rents are to be collected weekly, not more than a week's rent should be lost. Space is reserved in the basement of these buildings for a restaurant, kindergarten, drug store, general store, branch bank, branch library, and men's club.



Building Loans and the Building Revival

THE probable attitude of financial circles toward future building loans is now regarded with considerable interest. The men who control loaning capital are perhaps the keenest observers of everything that will foretell the future of building activity, and any expression of opinion on their part may be taken as a fairly reliable forecast.

The financial editor of the *New York Times* has secured interviews with a number of men who are prominently identified with building loan matters, and in a recent issue prints a summary of these expressions of opinions.

There appears to be a general concurrence in the opinion that the forthcoming building revival will be one of gradual development, and that there will be strong control of such construction enterprises as may be undertaken. By this means there will, it is believed, be avoided the creation of conditions that would tend to force prices to higher levels than at present. Further influence will be exerted in these matters to curb any tendency toward over-construction. In order to accomplish the desired ends, lenders of money on building loans have signified an intention to discriminate at the outset, in a sense, as to the character of new buildings to be financed. Apparently preference will be given to structures contributing to the industrial and commercial growth of this country and its present allies. It is therefore easily to be seen that speculative building, or ventures looking to the exploitation of land areas will be unable to avail of loaning assistance for a considerable period in the future.

Commenting on future indications the article referred to states:

Builders may begin to look for signs of a new era of construction throughout the country in several directions, according to these authorities. The initial seed of encouragement to the careful consideration of building loan applications will come when it is apparent to financiers that the process of rolling back the enemy has reached such a point that financial interests can freely feel that there can be no retrogression. The next supporting factor will be open and official evidence that the Government's requirements for rush construction have been met to such an extent, at least, that general options on available building materials and supplies will not be necessary to the extent at present exercised, so that manufacturers or jobbers

supplying building supply companies, which in turn supply contractors, can be reasonably sure of making deliveries when ordered.

Still another factor determining the signs of revival in building activity will be official indication that coal can be spared for basic building material manufacture without interfering with the flow of fuel to ships of war or commerce.

Another financier thought a factor in determining the change for building and builders will be the manner in which the next and largest Liberty Loan will be subscribed. If the larger part of it is taken, as in the last loan by the people the effect will be much more favorable on building loan minds and will be more helpful to the builder and the building investor than will be the case if the banking and financial institutions of the country have to bear the greater part of the burden. The final factor, of course, will be complete victory.

Victory must be assured before builders can even hope for a return of normal times, said one financier, but he added: "Who expects normal times while we are at war?"

Certainly we shall not expect normal times during war, but we can hope and work for a shortening of the period after the war before this country may return to usual peace conditions. That will be the period when the building interests in the country will need all the skilful guidance and financial assistance that can be brought to bear.

Undoubtedly the most important factor in this shortening of the period of readjustment will be the ability to learn the exact attitude of the Government toward any surplus of building material, labor and transportation, after the then rapidly lessening needs of the Government have been ascertained. If there is a disposition to control the use or application of this surplusage to hamper the free use and application of any available material, either by Government control or by Government influence exerted on loaning companies, the time when we shall be able to revert to normal conditions will be materially increased.

Building interests in this country have shown a fine degree of patriotism in quietly submitting to restrictions that have practically placed their business at a standstill. It seems reasonable to ask that a grateful Government will lift all restrictions and give the fullest co-operation at the earliest possible moment.

Tapestry and Architecture

By EDWIN S. PARKER

THE Gothic period of tapestry weaving was the logical culmination of a growth from within, the crest of a wave that rose from the masses as distinct from the individual, an art of the people who made and worked with their hands in the medium in which they found expression, not the scintillating brilliance of the master artist imposed upon the medium second hand, through the understanding and labor of others. And it was the greatest period of weaving of which we have direct knowledge.

But an evil influence was soon to enter. The brilliance of the Italian Renaissance was being rumored in western Europe, and artists who had been lured to Italy were returning, bringing with them, as their ill-gotten gains, a veneer of Italian refinement which was soon to overturn most that was good in their own work. For the marvels of Italian modeling in light and shade and the likeness of their work to the nature from which it was taken easily blinded the simple minds of these more primitive people to the more profound beauties of their own work, so that the Renaissance influence found fertile ground and changed forever the old order which had developed with the race to the new order which they at best could only partly make their own. And with the "divine art of perspective," as Dürer called it, came the worst of all the Renaissance mural fallacies.

But even with the introduction of perspective the rendering was still in some cases kept flat, for the perspective was not always true and the old Gothic tradition of "flat modeling" was still in force (illus.). This flat modeling is really as remarkable as the plastic, for where in the latter case three dimensions are represented upon two, in the former three dimensions are reduced to two, while the third is implied, but not directly represented.

The transition from the old order to the new was, of course, not immediate, and we find good mingled with the bad, but the cartoons which the Italian patrons sent to the low countries with their orders for tapestries were reproduced in cloth with marvelous fidelity, and this was the most potent influence which came to bear upon the weavers. These Italian cartoons were wonderfully plastic, and though this is no fault when the painting is isolated from all connection with the wall by a frame, it is always a fault when the painting is directly upon the wall surface. Besides this the Italians were primarily decorators of large wall spaces and many of

their smaller things are distinctly out of scale as pictures and as decorations. And so the sixteenth century tapestries besides becoming plastic lost their sense of scale and seem to have done everything in their power to violate the architecture which they meant to make more beautiful.

And they committed another felony to art. The beauty of a medium has a value of its own, and though it is a great feat to make cloth look like paint, just as it is to make a painting look like a crayon, it is a desecration of the medium itself. The painting should look like paint, conspicuously paint with no vestige of sham about it, and the tapestry should show forth the marvels of the art of weaving: the beauties which are peculiar to cloth. And so to imitate painting in cloth was the final fatal error.

Here we must ask ourselves: why can a good picture be plastic while a tapestry or mural must not? Why is there such a distinction between the decoration which is applied to the wall and the one which is merely hung there? But the answer is very obvious when we remember that the room is incomplete without furniture and this distinction is really one between the architecture of the building and the articles which furnish it. The painting or tapestry on the wall is part of the architecture and must not violate its integrity, but the painting hung there is isolated from all that surrounds it by a frame and forms a thing in itself, an organic whole apart from any possible surroundings, and has no more to do with the architecture than a chain or table. So we may hang pictures at will, but murals must be architectural.

There are, of course, tapestries woven with a border that serves very effectively as a frame, and these at first sight form an exception to the rule, but the flat fabric clings to the wall closely, while the painting is usually out from it at an angle, and while the latter thus unifies with it neither in plane nor in position, the former forms a part of the apparent wall surface and must obey the laws of the architecture. And the frame merely adds an element of ugliness in trying to obviate this.

Tapestries are decorative pure and simple, but when we come to rugs and carpets we are on the borderline between decoration and furniture, though as forming the surface upon which we walk they have a certain architectural significance. For on the floor, even more than on the wall, we expect

(Continued on page 171)

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Art and the War

THE English architectural press is taking serious objection to the work of certain artists, who are now commissioned by the Government to set down in black and white and in color, the many phases of war activity. The suspicion grows that the British public is being imposed on to a remarkable degree by groups of artists who, under the guise of authority, have allowed their penchant for outré forms of expression in art to run riot. In other words, the true educational value of such delineation of war scenes is largely depreciated by the introduction of the methods of the school of the post-impressionist and the *nouveau art*.

Fortunately no such tendency has become apparent in this country. The men who have been selected by our Government to go among our fighting men are returning material that not only possesses the highest historic value, but is also rendered in the best expression of art. Even the man who has had no artistic training will be impressed by the rare excellence of the posters designed to exploit our recruiting, the sale of war securities and to further the work of the Red Cross and Y. M. C. A., those invaluable adjuncts to our war work.

In fact, discerning people will feel that the impetus to American art, as furnished by this war, has

in the brief space of weeks set us further forward than any periods of decades in the past. This influence of good art on the people who are here, and at a time when its impression is most insistent, is second only in value to that influence on the fighting men whose sojourn in Europe and particularly in Northern France, will have taught them a very deep respect for the beautiful. They will have noted the veneration that the inhabitants of every town feel for the good that surrounds them in any form of art, and the despair they have displayed when these priceless things have been menaced by the invader.

All these influences of art now surrounding us will become of such enormous value in the future as to advance the time many years when art will become an essential part of our daily lives. There is small danger, at least in this country, that any group of men who shall endeavor, by vulgar mannerisms, to set up erotic or perverted styles in art, will meet with success.

Our people, tried in the hot crucible of a great war, will have learned many manly things, and among them will be the appreciation of a sane and manly form of art.

Organization in the Practise of Architecture

"IN union there is strength." The truth of this adage is every day exemplified in the fields of commerce, manufacturing and labor. Combinations and trusts in commerce continually grow in size and importance. Small manufactories that fail to be productive or go into bankruptcy, by combining become thriving, growing concerns. No comment is necessary as to the results of unionizing the labor interests. They speak for themselves.

With all of this accumulated evidence the architectural profession apparently fails to recognize, except in a few instances, the advantages that are to be gained by practical organization on the same basis as that pursued in other branches of industry.

Architectural practice now differs greatly from what it was a quarter of a century ago, and when this war is over and those in service return to their peaceful avocations, and construction in this country once more resumes its normal course, it is certain that even greater changes will ensue. Those now in the war who escape its perils will bring back with them a highly developed appreciation of the value of organization and discipline. Without doubt team work will largely supplant individual effort in the conduct of future architectural practice.

The value of a more modern system of organization is already recognized by the larger architectural

THE AMERICAN ARCHITECT

firms, where in one way or another, even though a business is operated under a single name, the actual composition of the firm is a combination of several men, each bringing to it a specialized ability. The names of these men may or may not appear on the office stationery, but they have an interest in the business beyond a salaried income.

Better organization has become necessary, for, under modern demands and requirements laid upon it, architecture has become so complicated a process that it is a physical impossibility for one man to do the work, or for one mind to combine in itself all the different functions that must be utilized in successfully carrying out any important piece of work. The ability to design has gradually ceased to be the first requirement.

The weak points in an architect's method of conducting his business and those on which a trained business observer would lay particular stress would doubtless be the selling of his output and its administration after it has been sold. The architect must first secure his opportunity before he can demonstrate his ability. This is a difficult obstacle, as it is not an easy task to sell brains. Comparatively few members of the profession have the natural gift of salesmanship, and few acquire it. Why would it not be desirable to incorporate a course in salesmanship of services in the curriculum of schools of architecture?

The ability properly to administer his work is equally important, for if it is not satisfactorily carried out, dissatisfaction on the part of the client results. Administration includes not only all the many business details, but also the supervision of the actual construction work. Here many men fail. Architects, and the men they employ, often through

a lack of practical knowledge of materials and of the methods that are used to incorporate them in the building, lose the confidence of both client and contractor; and often work unintentional injustice to one or the other of these parties.

With better methods of organization and administration, the practice of architecture would undoubtedly take the place it should occupy and the profession would be freed from the adverse criticism that has so often been expressed.

A Question of Depreciation

Will the value of the housing operations now being pushed to conclusion suffer large impairment at the termination of the war, regardless of the permanence of the structures? This matter is being discussed seriously in the economic press, and there has thus far been disclosed very divergent feeling. One authority is of the opinion that large impairment of values might result if the new housing work were superimposed, in its entirety, upon the normal housing of the country. It is believed, however, that, on the contrary, there is to-day a more intense compression or restriction of housing than has ever been known in this country. In order to minimize as far as possible the impairment of values that would naturally occur when, after the war, the activity in industrial locations is lessened, the Government is endeavoring to improve transportation facilities so that the worker may reside further from his place of labor and lose but little if anything in time and expense in going to and from his work. By this means there would not be the great changes in population that would otherwise occur, and conditions would, in a measure, become stabilized.

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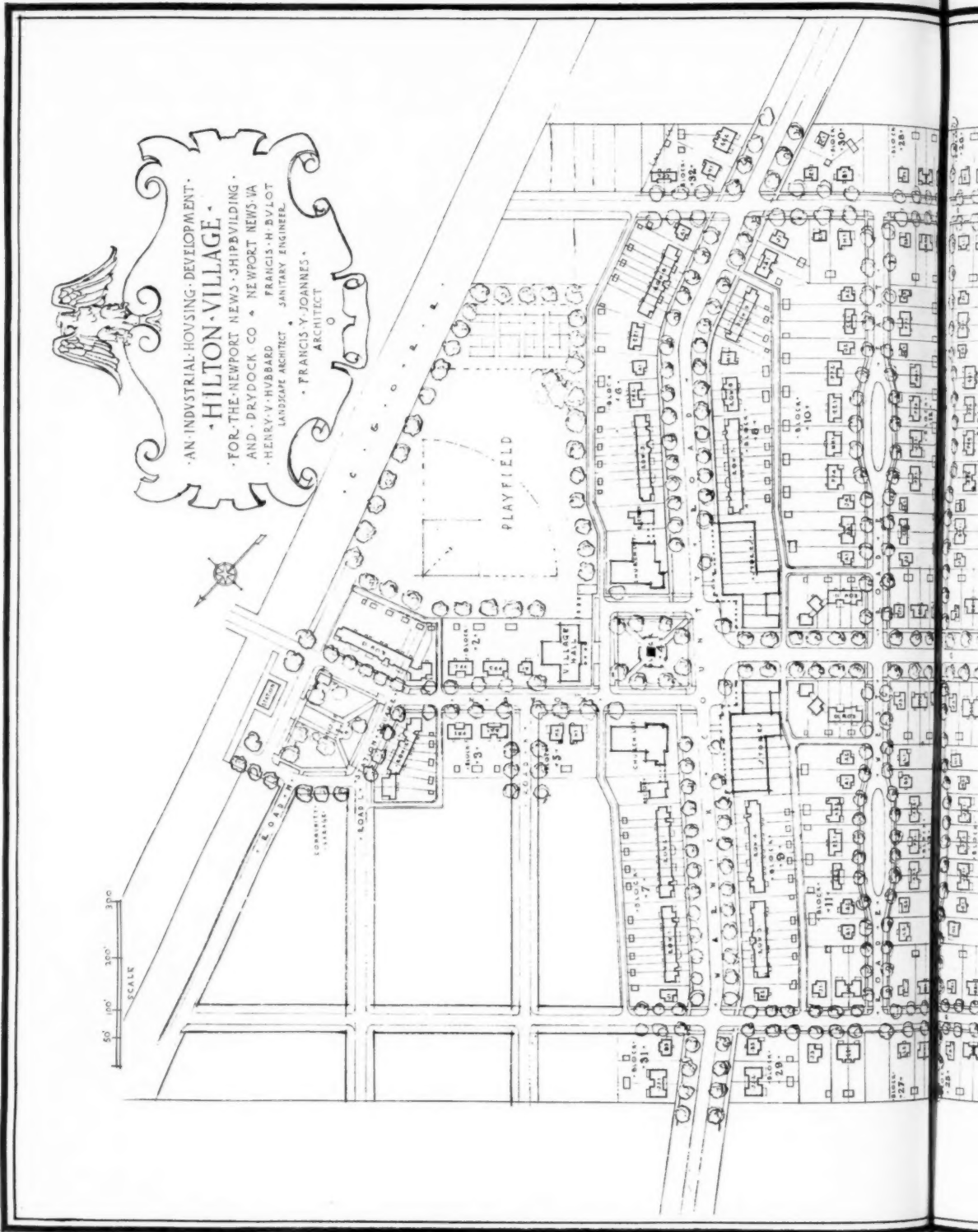
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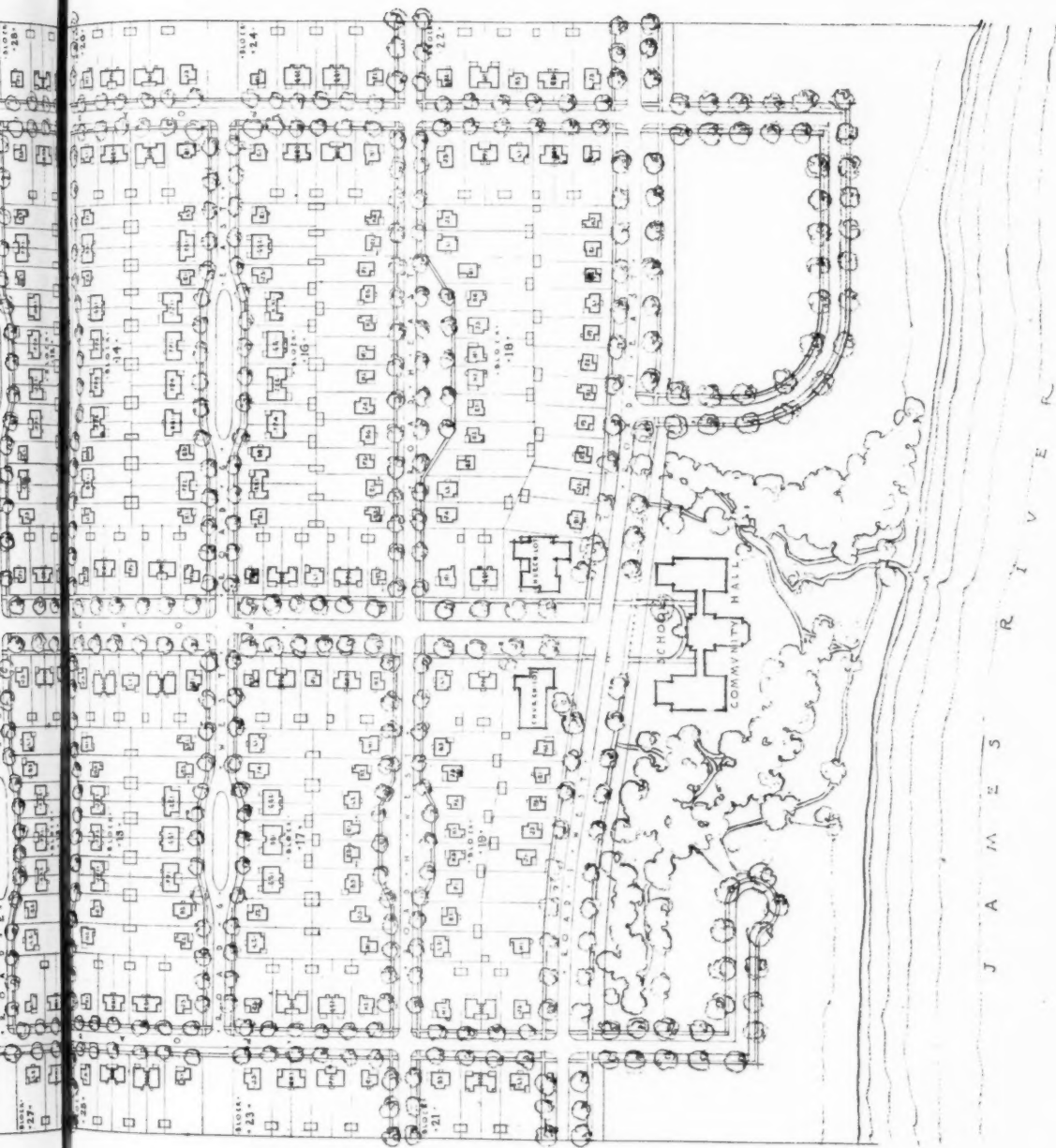
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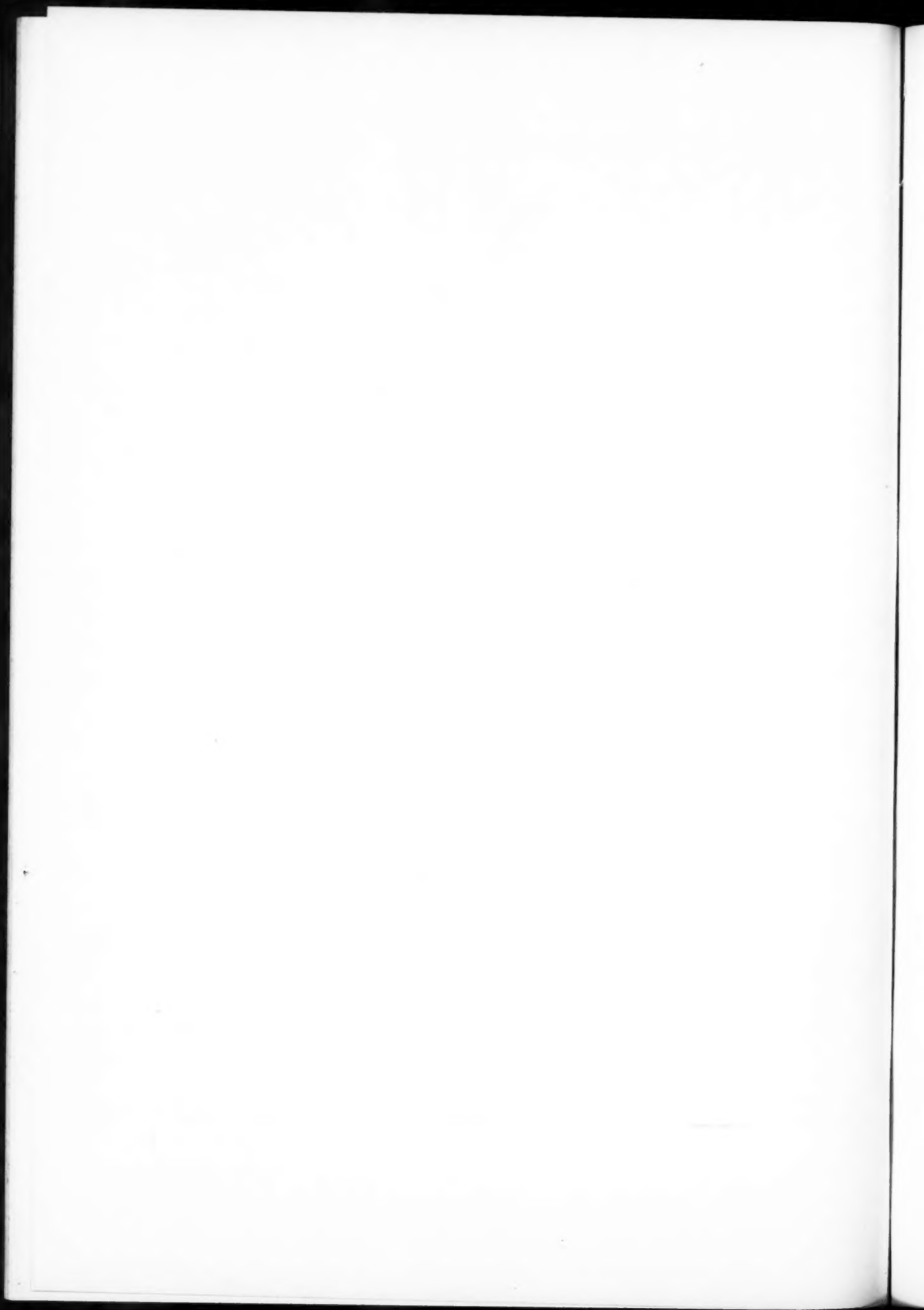
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AUGUST 7, 1918







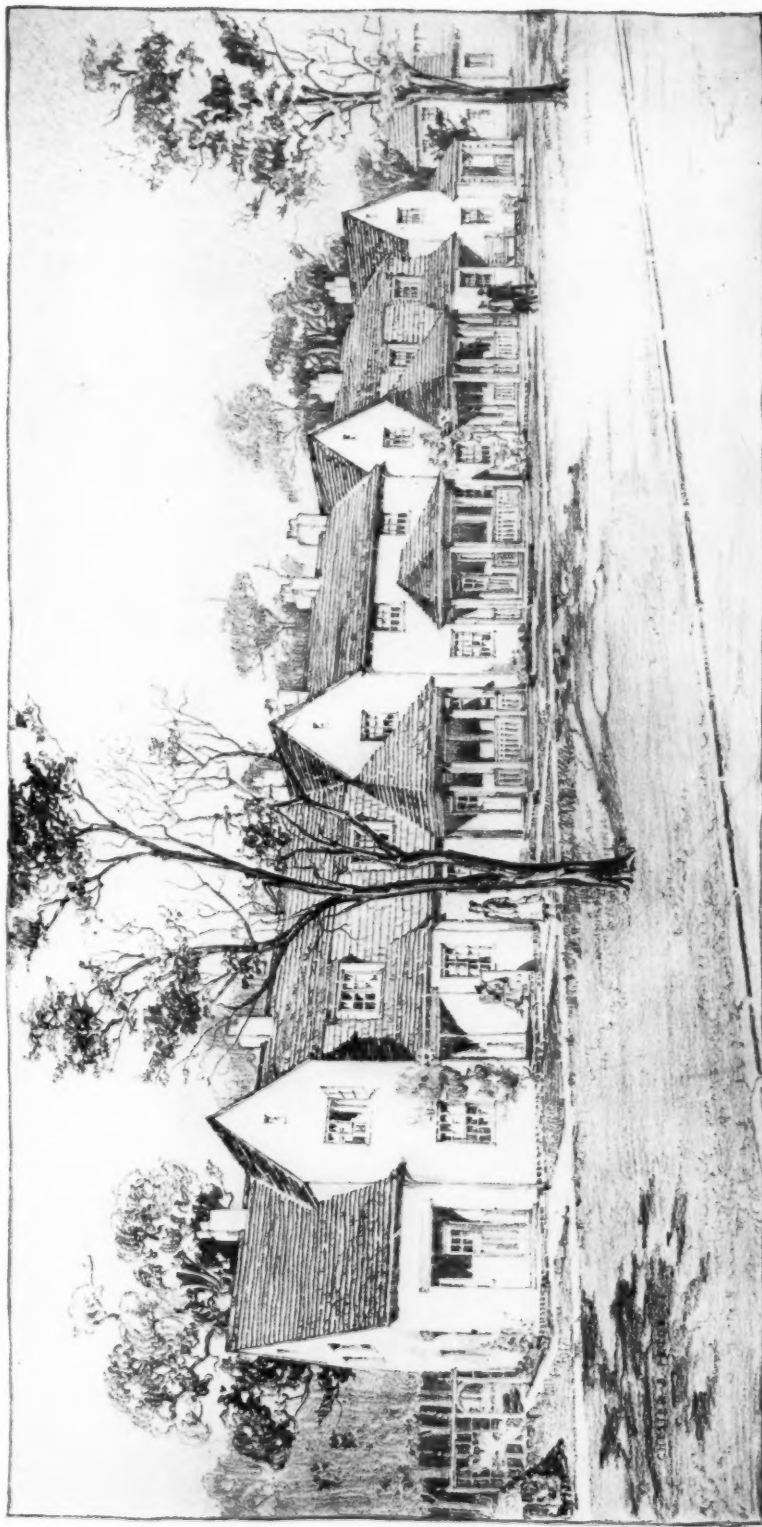


PLATE 43

ROW HOUSES, TYPE 2

HILTON VILLAGE

An Industrial Housing Development for the Newport News, Va., Shipbuilding and Drydock Co.
FRANCIS Y. JOANNES, ARCHITECT

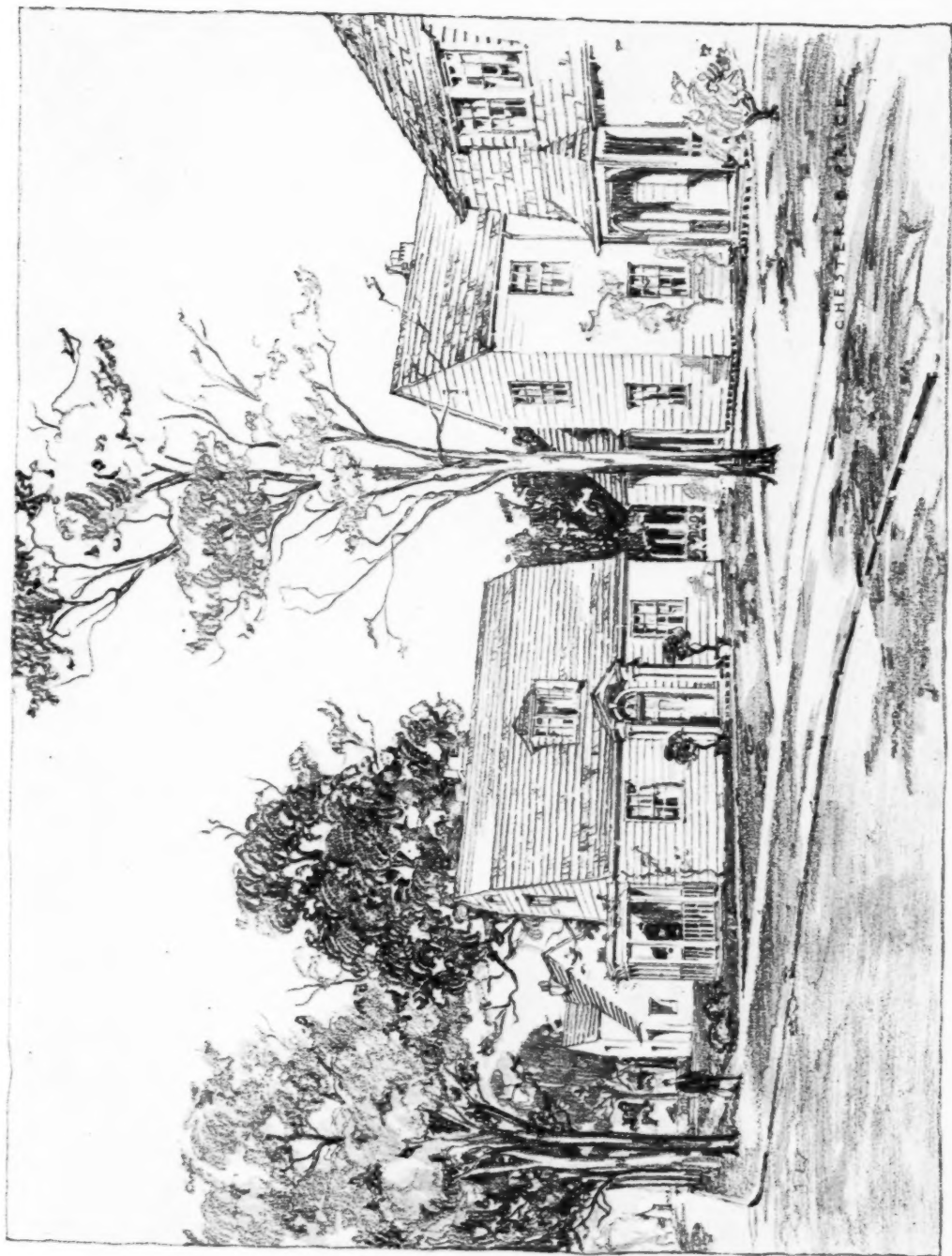


PLATE 44

CORNER OF A PARK COURT ON A CROSS STREET

HILTON VILLAGE

An Industrial Housing Development for the Newport News, Va., Shipbuilding and Drydock Co.
FRANCIS Y. JOANNES, ARCHITECT



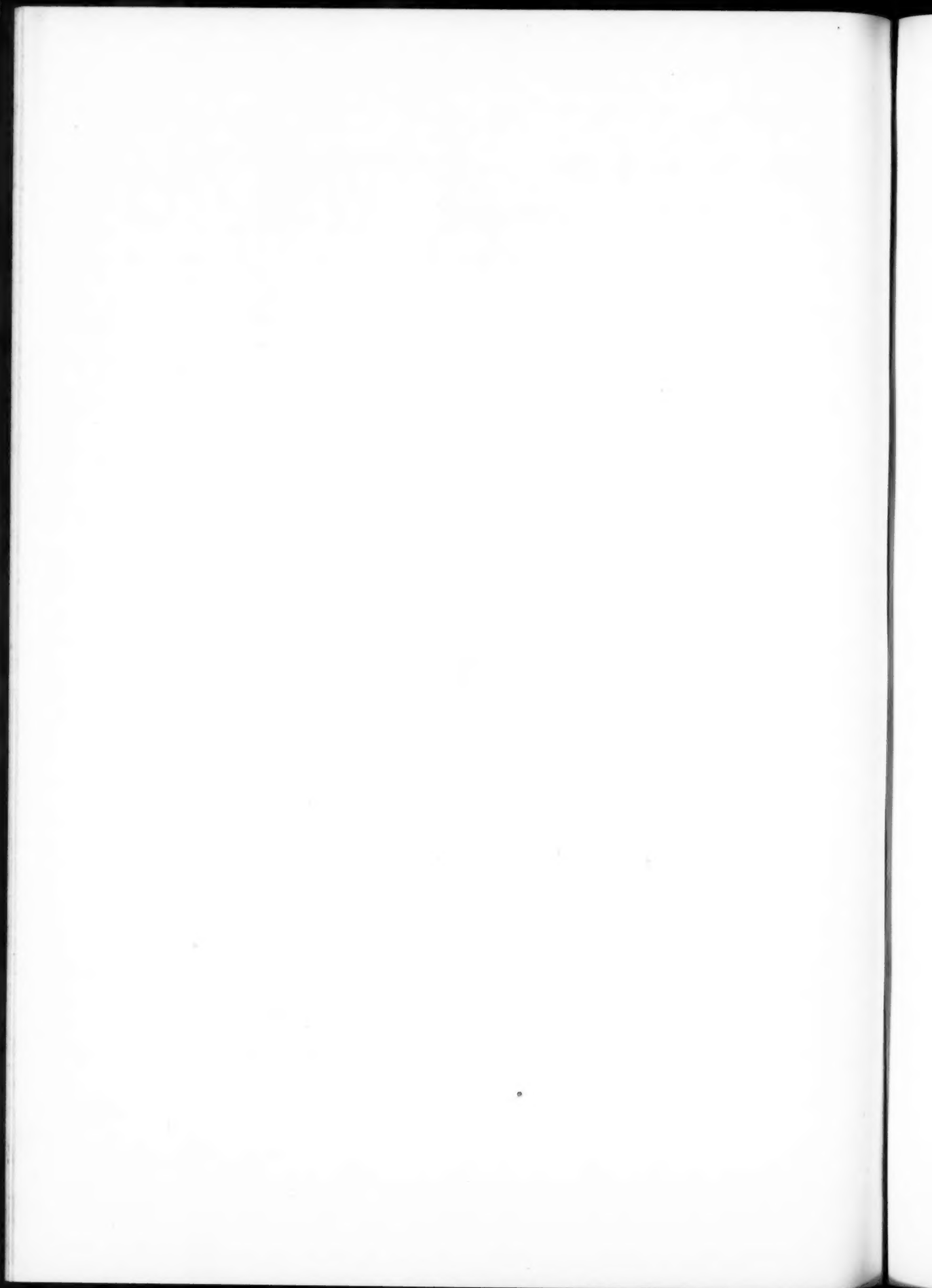
PLATE 45

ON WARWICK COUNTY ROAD SHOWING HOUSE, TYPE H-1 AND ROW NO. 8

HILTON VILLAGE

An Industrial Housing Development for the Newport News, Va., Shipbuilding and Drydock Co.

FRANCIS Y. JOANNES, ARCHITECT



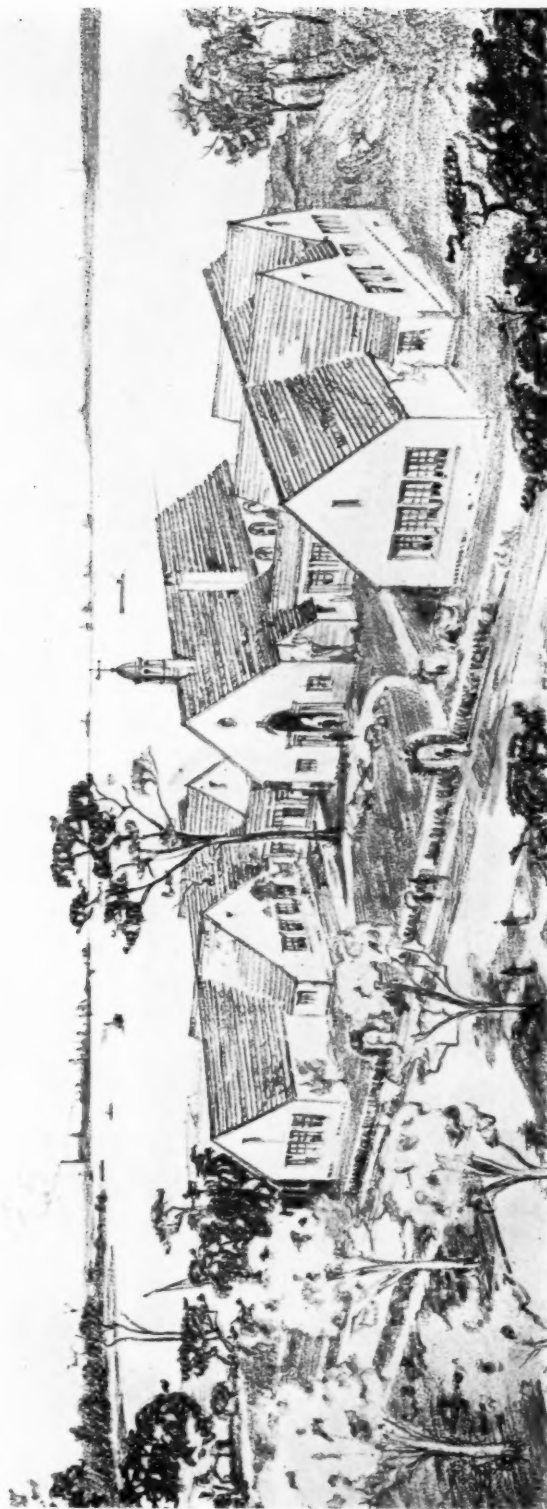


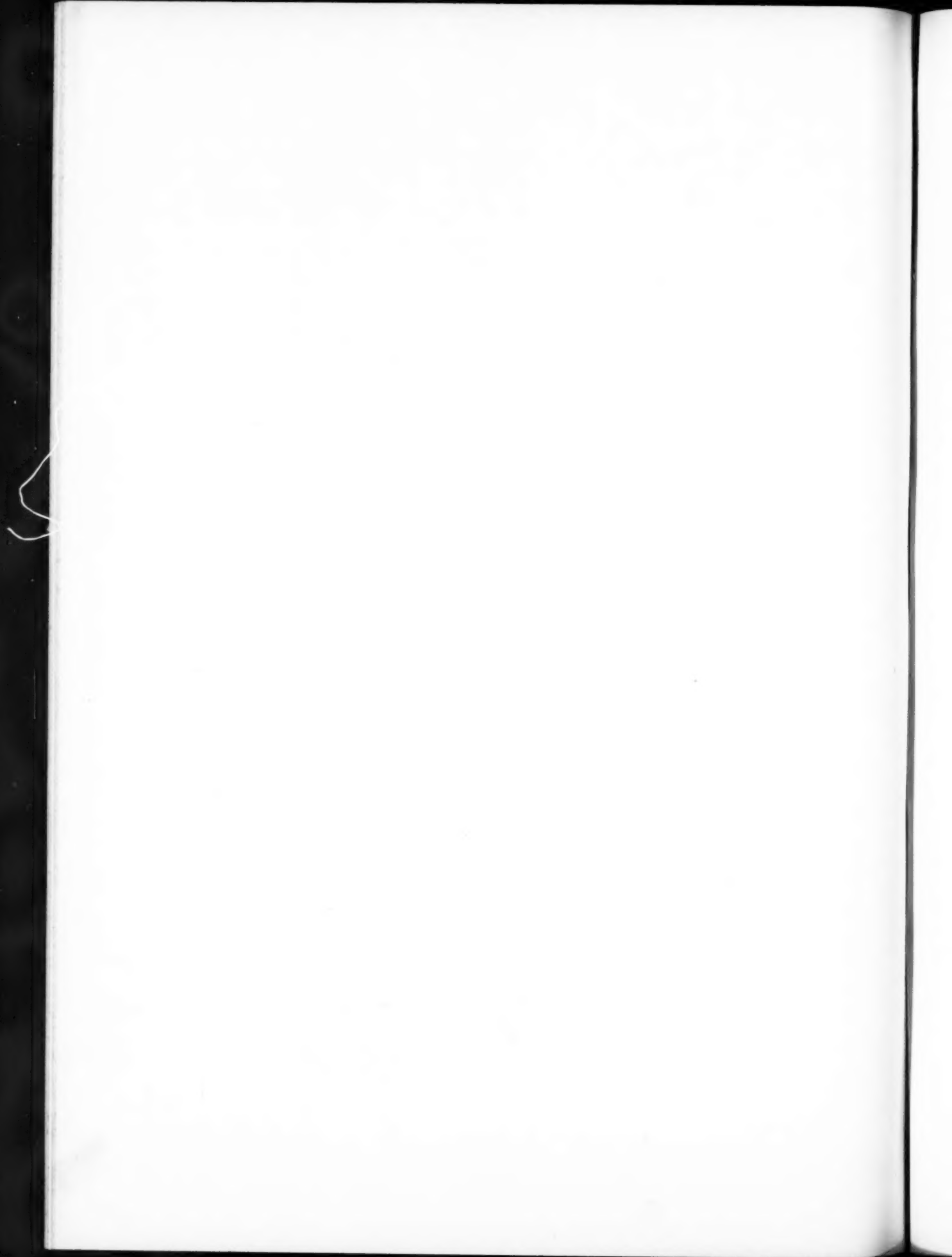
PLATE 46

COMMUNITY HALL AND SCHOOL, LOOKING TOWARD NEWPORT NEWS AND THE SHIPYARDS

HILTON VILLAGE

An Industrial Housing Development for the Newport News, Va., Shipbuilding and Drydock Co.

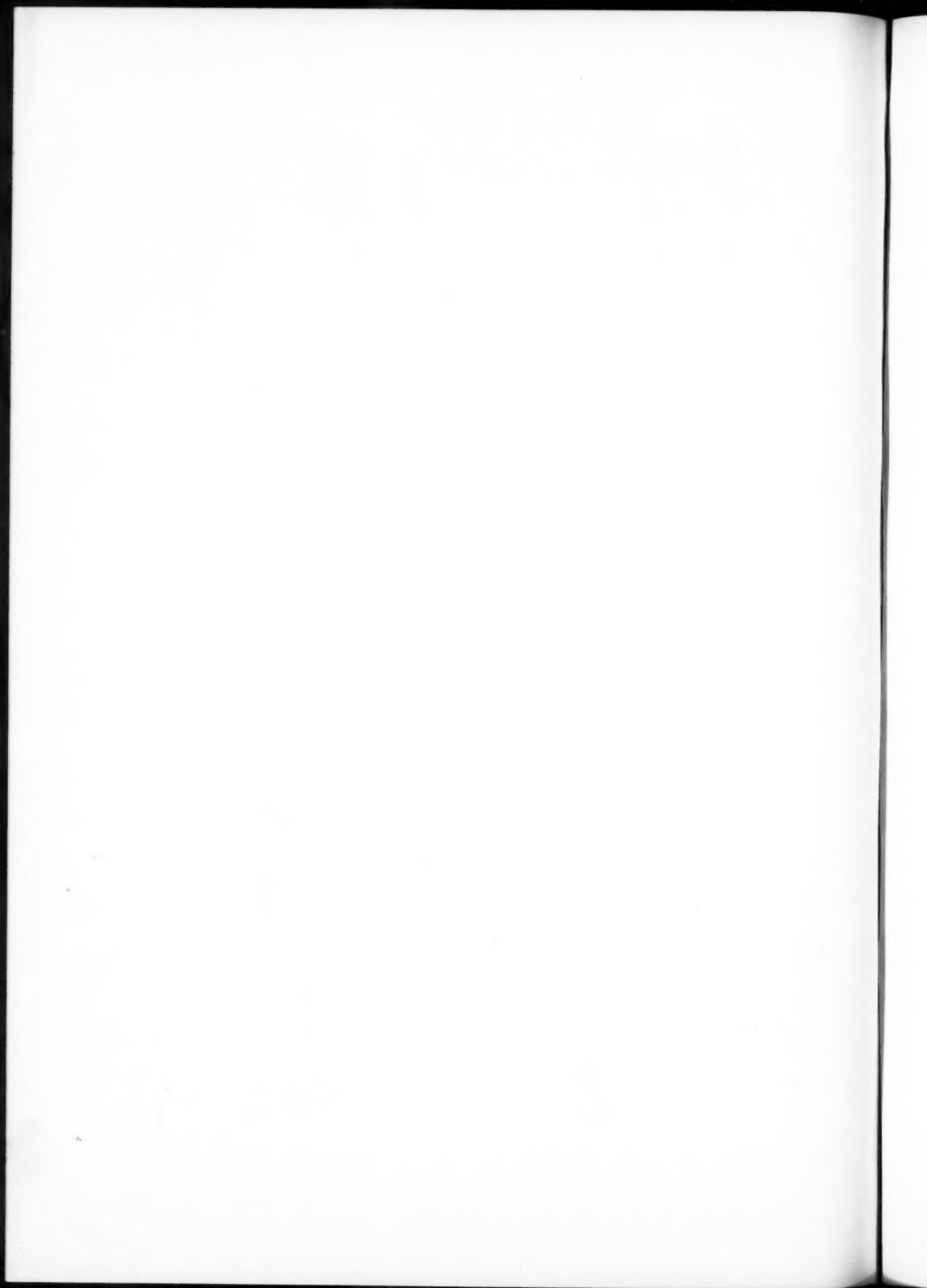
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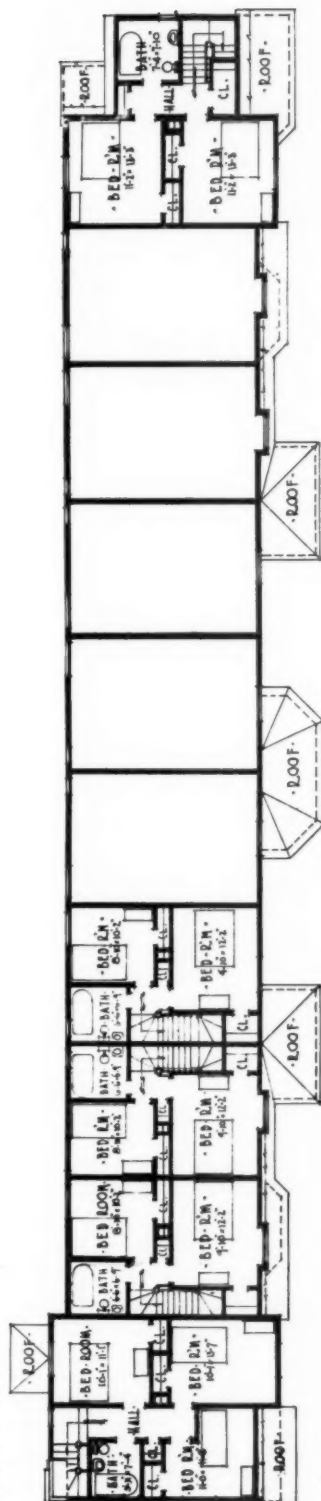




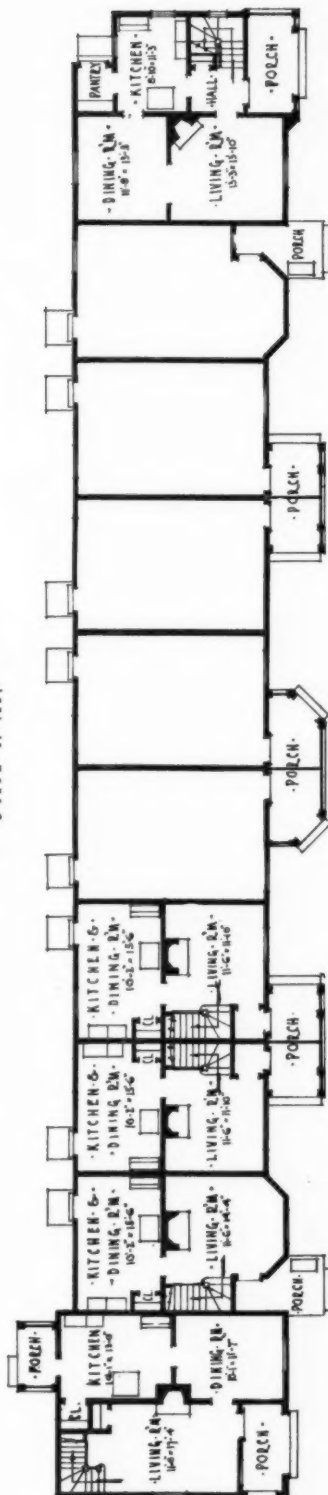
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SECOND FLOOR PLAN



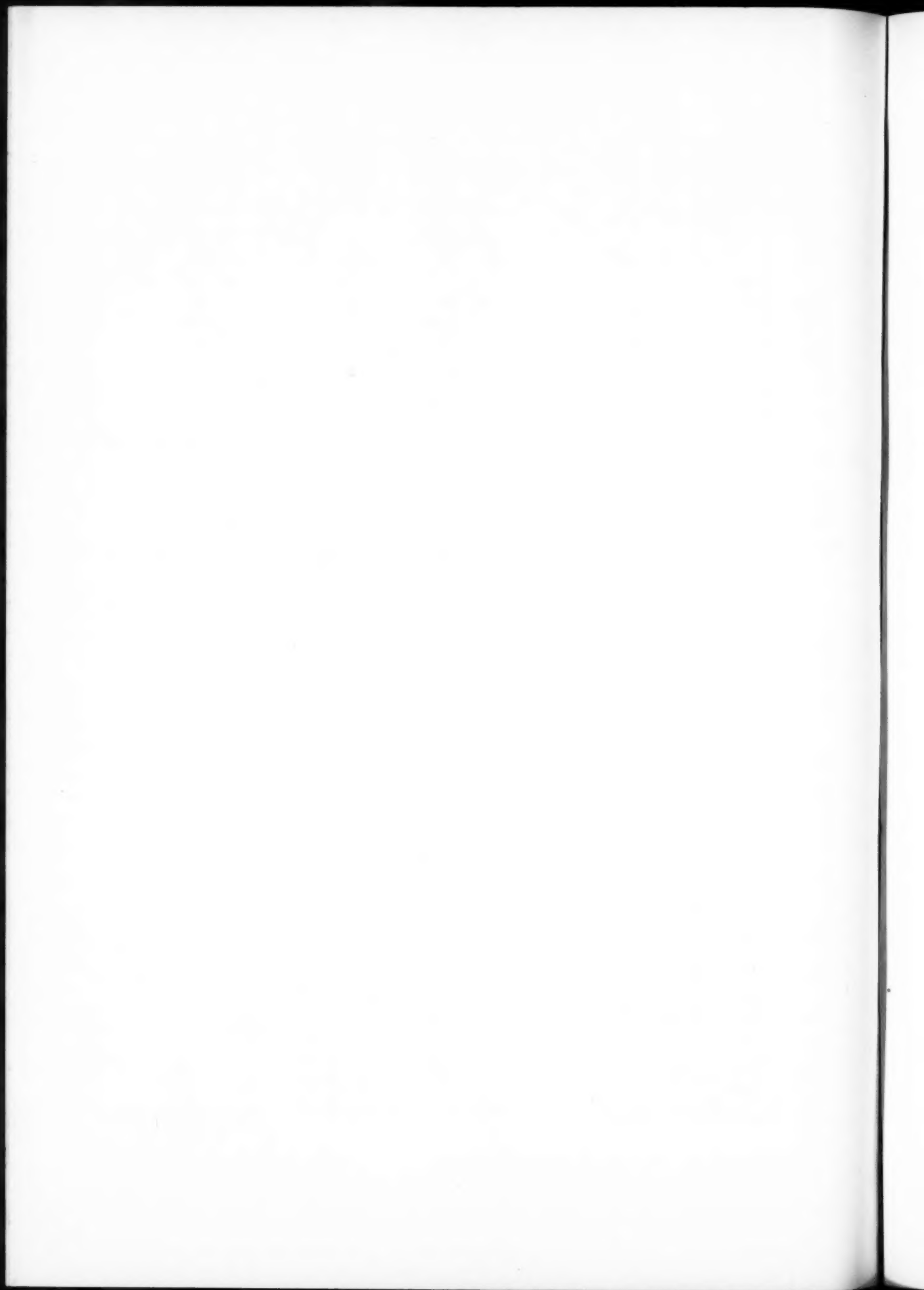
FIRST FLOOR PLAN

ROW NO. 2 - ONE SIX ROOM HOUSE, EIGHT FOUR ROOM HOUSES, & ONE FIVE ROOM HOUSE

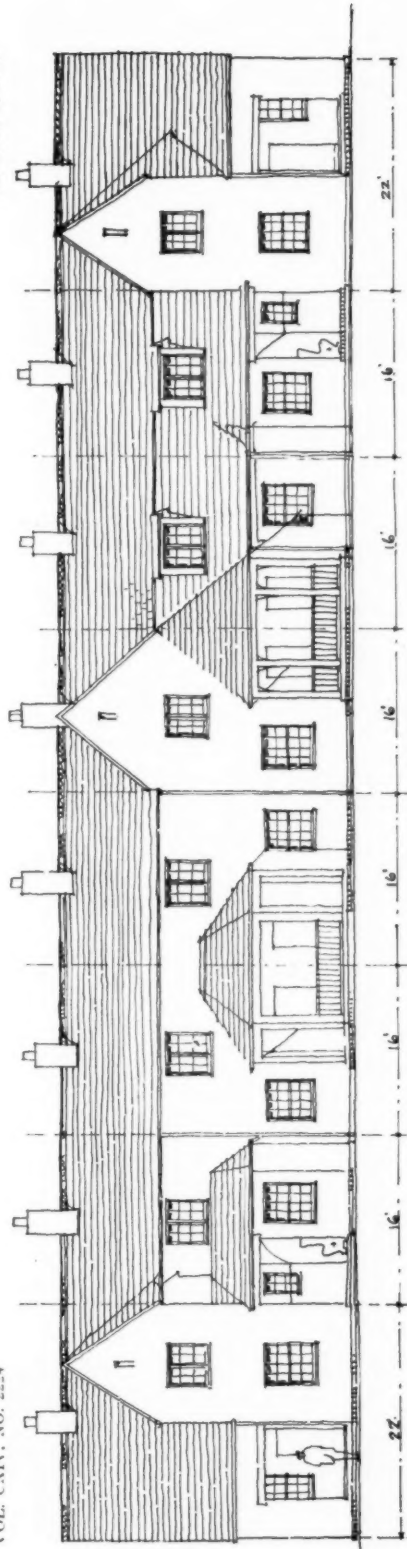
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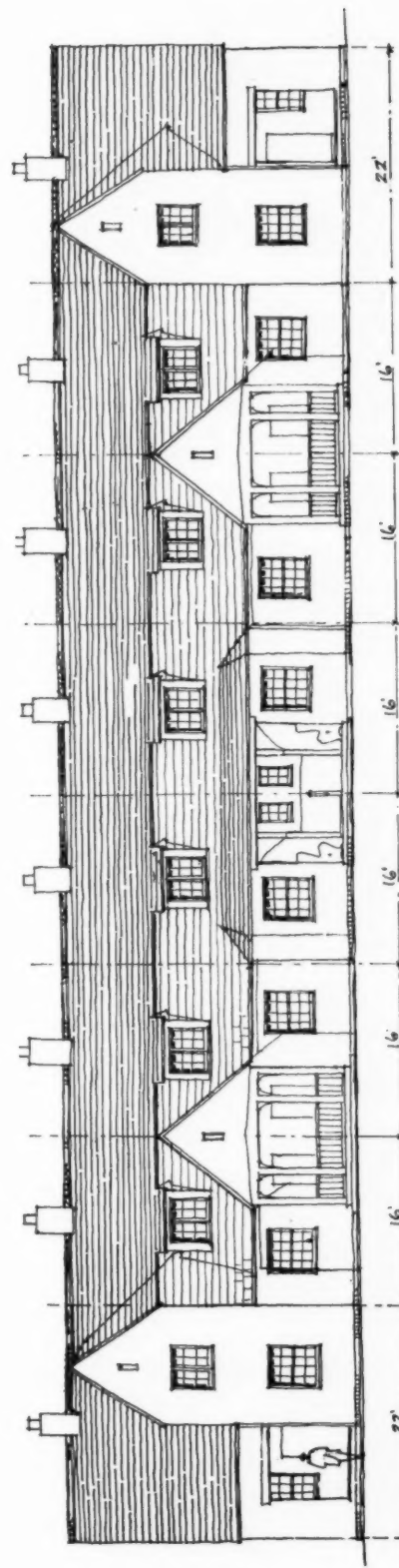
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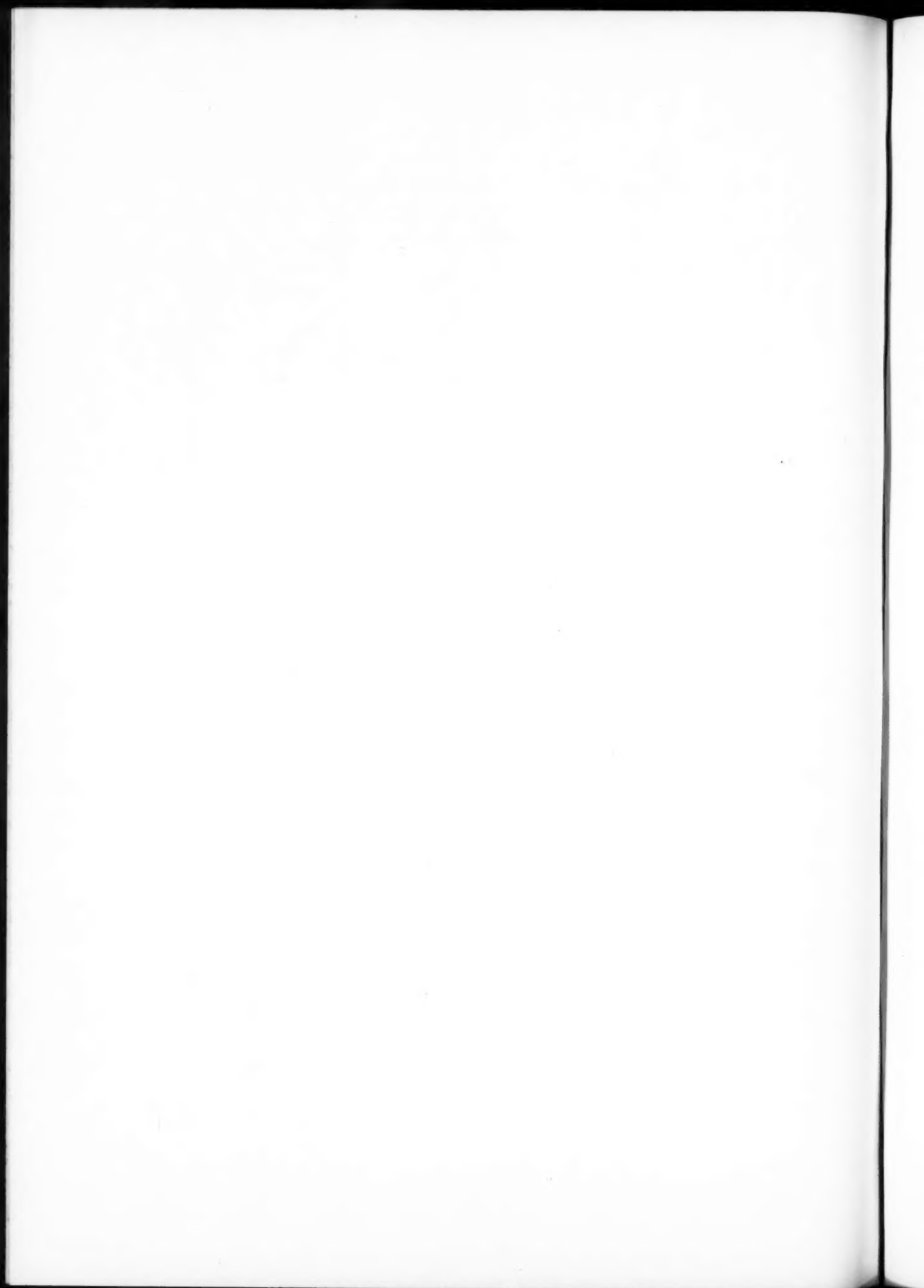
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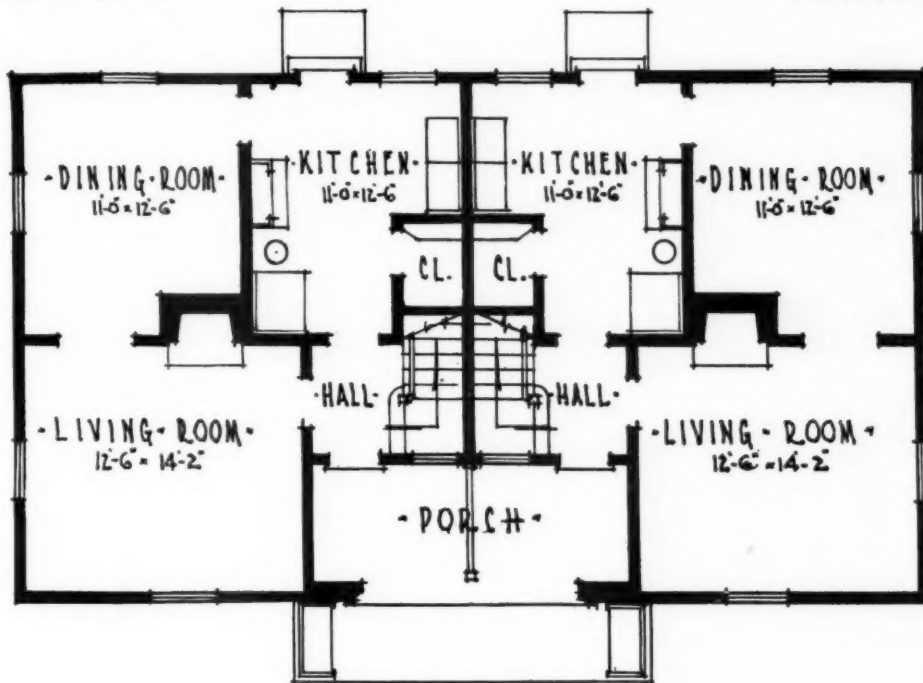


ROW No 6

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FIRST FLOOR PLAN
SIX ROOM HOUSE—TYPE FF-1

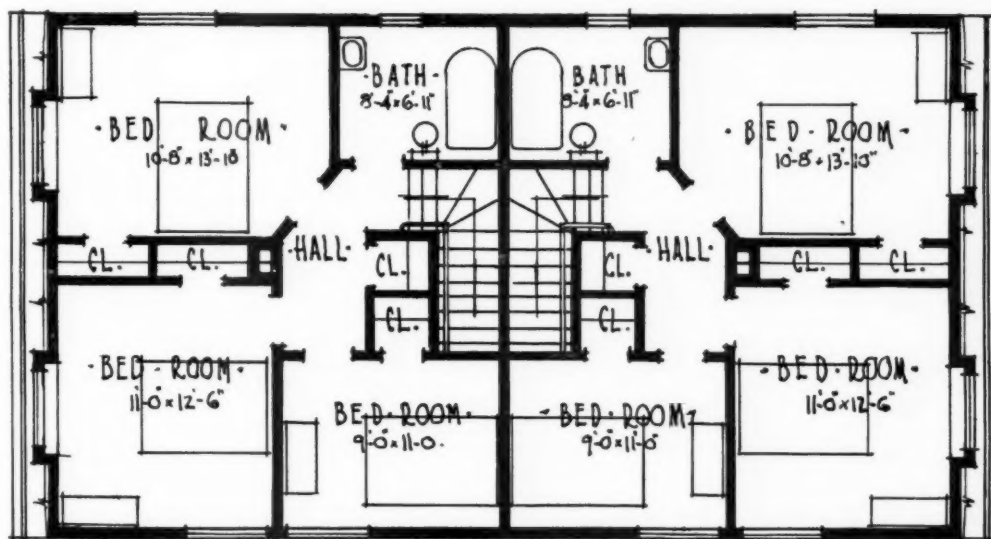


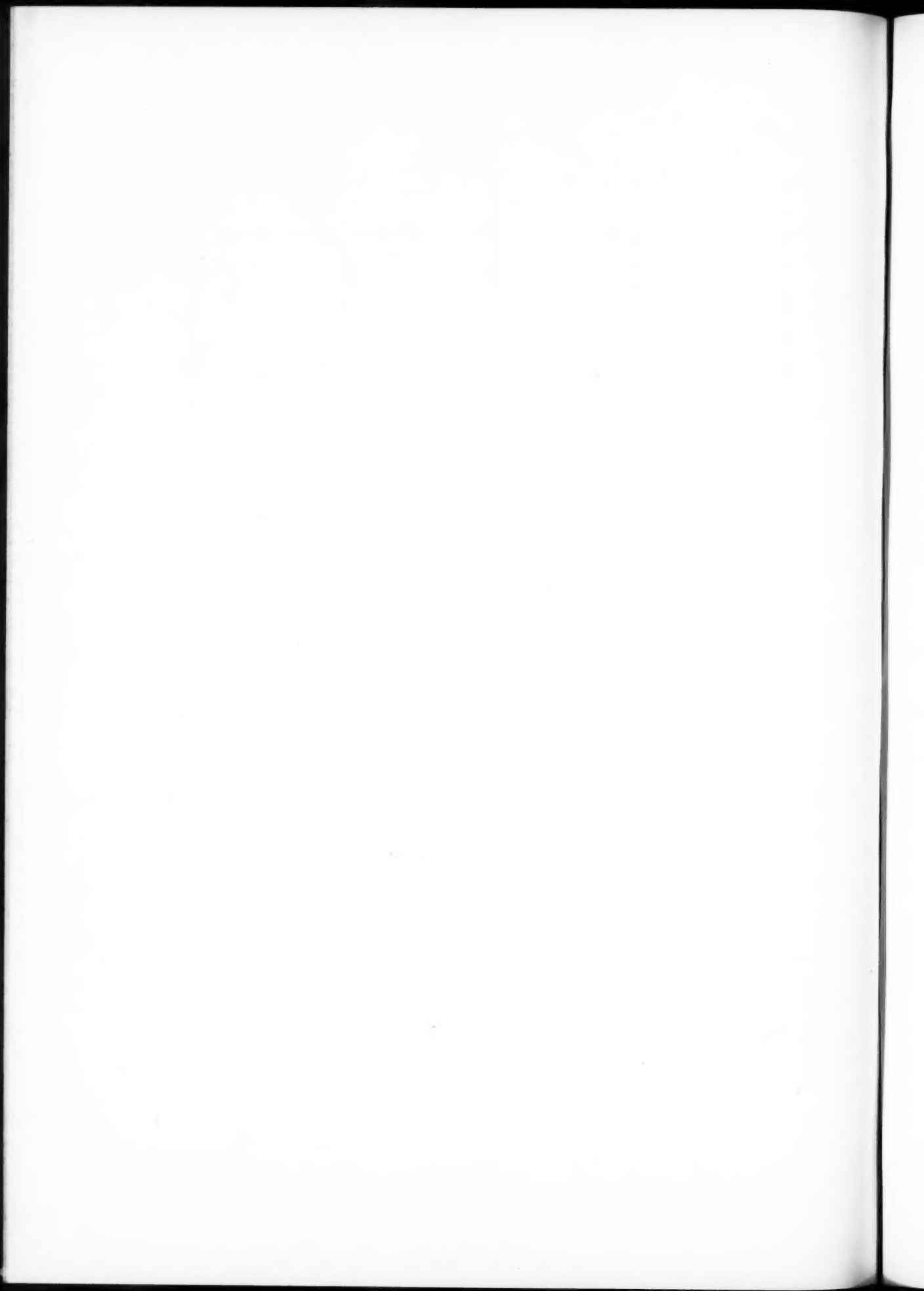
PLATE 50

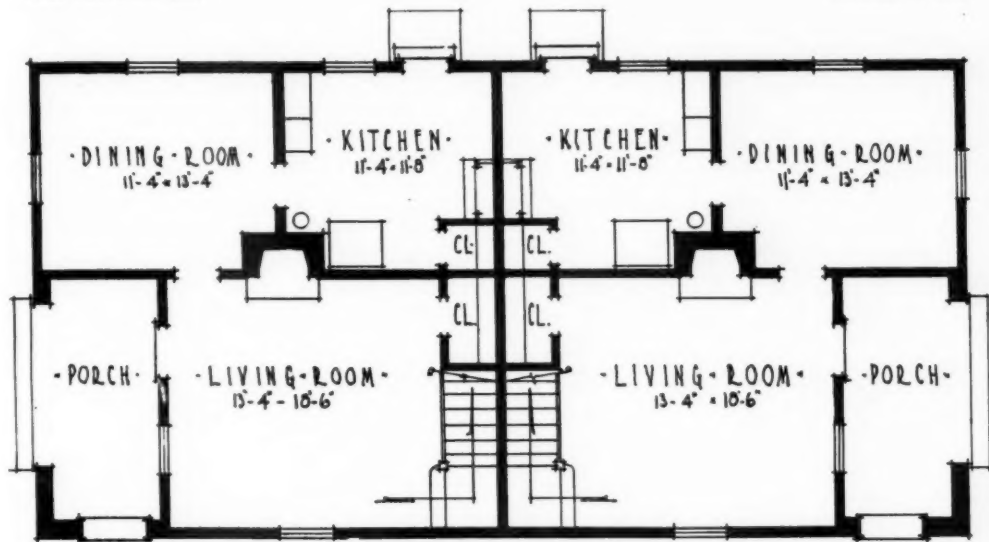
SECOND FLOOR PLAN
SIX ROOM HOUSE—TYPE FF-1

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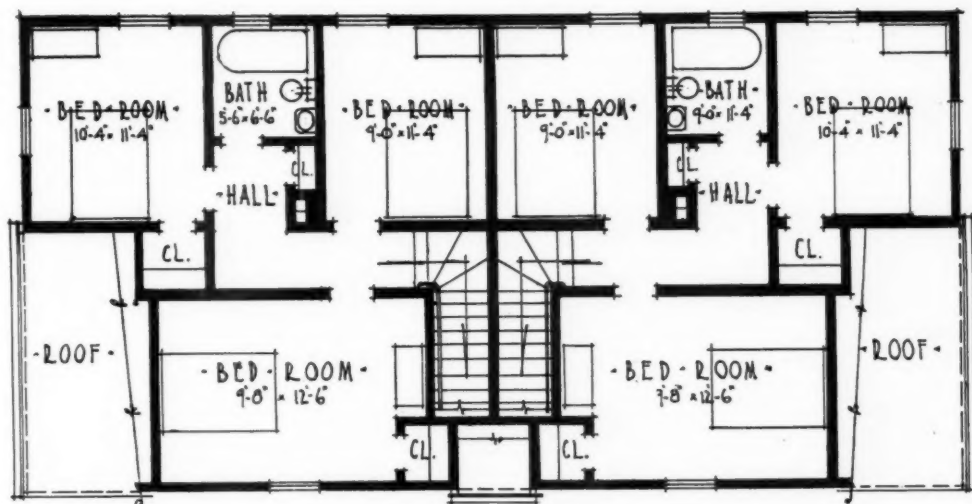
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FIRST FLOOR PLAN
SIX ROOM HOUSE—TYPE EE-1



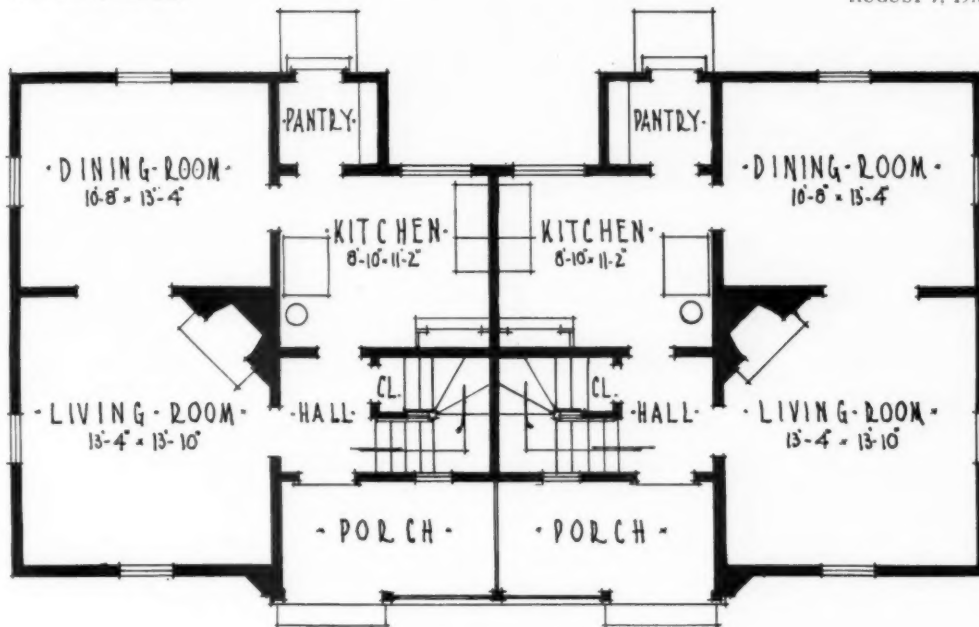
SECOND FLOOR PLAN
SIX ROOM HOUSE—TYPE EE-1

PLATE 51

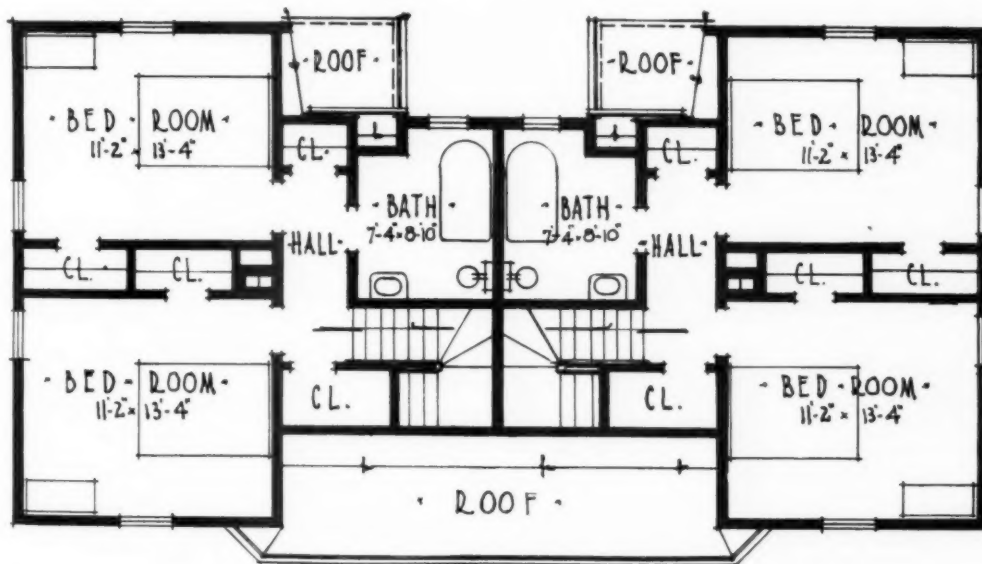
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FIRST FLOOR PLAN
FIVE ROOM HOUSE—TYPE AA-1



SECOND FLOOR PLAN
FIVE ROOM HOUSE—TYPE AA-1

HILTON VILLAGE

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Tapestry and Architecture

(Continued from page 168)

and demand a plane surface or we get the illusion of stumbling over the pattern. Most oriental rugs are perfect in this respect, but the modern carpet with spots of color on a plain ground is almost sure to give us this ugly illusion of plasticity.

Rugs from China are famous, but we see why the tapestry was with them the rare exception. They wove tapestry mostly in silk, and the labor of weaving a piece large enough to cover a wall would be prohibitive, so their tapestries are almost entirely used as garments and we have few examples from the Far East of woven wall coverings.

But to return to tapestries. The realization of the decadence and degradation to which the art of weaving had fallen led certain men, notably William Morris, to start afresh, and from a sound basis, to build an art true to itself and to its time. The result we all know, and the pre-Raphaelite tapestries he has left us are exceedingly beautiful, though not without exception, for though they are

truly in terms of their own medium, free from all resemblance to paint, and true to the graphic art of the day with no kind of affectation, they are not always as flat as might be desired, though possibly as flat as he could make them.

Recently, however, there has been a Gothic revival in America and tapestries have been produced very like the old ones in spirit and appearance. But imitation, however much better it may be than contemporary work, and however charming in itself, is at best a dangerous thing. To imitate religious art without the inspiration of the devotees is to become profane, and it is likewise profane to deal second hand in secular subjects which have been made beautiful in times past by a love and fancy now dead and gone. And though this revival of the Gothic may be a step in the right direction, it is but a step after all, for we must produce things in terms of our own times, in terms of light and color, of steel and concrete, not of lances and fair ladies, if we are to take our place among artists and become effective in the restoration of art to its high place among the great realities of life.

When Our Swords Turn to Plowshares

When Johnny Comes Marching Home victorious and lays aside his rifle and uniform, a place must be found for him in the ranks of civil life, and now is the time to prepare for it, says *The Literary Digest*. Some of them find a partial solution in the plan of Secretary of the Interior Franklin K. Lane, to settle those who wish to farm on lands prepared by the Government. It is noted that if the war is a long war, five million men must find a path back to ordinary life when it is over, and though a large part may return to the work and even the positions they had left, a very large proportion will be more or less at sea. In Secretary Lane's plan, set forth in a letter to the President and in several speeches, we are reminded that the nation still has millions upon millions of undeveloped acres, desert land that must be irrigated, swamp land that must be drained, cut-over timber land that must be stumped out and made arable. The question of reclaiming arid and swamp land, the *Syracuse Journal* recalls, has been before Congress in one form and another for many years, but no serious consideration was ever given to it. Events seem to show that Secretary Lane has brought it up at the psychological moment, and it trusts that the note he sounds will not be ignored by the wise men in Congress. A portion of Mr. Lane's letter to the President is quoted.

"A million or two dollars, if appropriated now, will put this work well under way. This plan does not contemplate anything like charity to the soldier. He is not to be given a bounty. He is not to be made to feel that he is a dependent. On the contrary, he is to continue in a sense in the service of the Government. Instead of destroying our enemies he is to develop our resources.

"The work that is to be done, other than the planning, should be done by the soldier himself. The dam or the irrigation project should be built by him, the canals, the ditches, the breaking of the land, and the building of the houses, should, under proper direction, be his occupation. He should be allowed to make his own home, cared for while he is doing it, and given an interest in the land for which he can pay through a long period of years, perhaps thirty or forty years.

"This same policy can be carried out as to the other classes of land, so that the soldier on his return would have an opportunity to make a home for himself, to build a home with money which we would advance and which he would repay, and for the repayment we would have an abundant security.

"The farms should not be turned over as the prairies were—unbroken, unfenced, without accommodations for men or animals. There should be prepared homes, all of which can be constructed by the men themselves and paid for by them under a system of simple devising by which modern methods of finance will be applied to their needs."

One-Roomed Houses

It is interesting to learn that in Scotland there is serious consideration of a one-roomed house in certain town-planning schemes now going forward.

While naturally the habits and customs of a people will influence any plans of housing that may be projected, it is difficult to understand just what arguments could, in this twentieth century, be advanced in favor of a house of this type.

The following is clipped from a recent issue of *The Architect and Contract Reporter* of London:

The *Dundee Advertiser* in the issue of June 12 gives some interesting particulars on the question of the one-room house and the discussion by the Housing and Town Planning Committee, by which it will be seen that they have decided to make an effort to induce the Local Government Board to refrain from prohibiting the extension of the one-roomed house in connection with the Logie Housing Scheme.

At a recent meeting of the committee Bailie Buist, the convener, said the superior of the Logie estate objected to one-room houses in the plans for the Logie scheme, and the Local Government Board objected to one-room houses generally. As there were only thirteen one-room houses in the Logie plans out of over 200, he suggested that they be dropped. In the Scottish housing report all one-room houses were condemned.

Mr. Spence: They don't condemn them absolutely. They speak against them except in exceptional circumstances.

Mr. Barnes said there were exceptional circumstances in Dundee, where there were so many single women, who did not want more than a good one-room house.

Mr. Barnes agreed that they might drop the one-room houses in the case of the Logie scheme, but they should let the Local Government Board know that this was not to be a precedent.

Mr. Scrymgeour asked if there were to be one-room houses at all.

The City Engineer said the committee were providing a proportion of 5 per cent of one-room houses.

Mr. Spence: The Local Government Board objects to even 5 per cent.

Mr. Scrymgeour said he wanted one-room houses cleared out, but they must say what they were to do for the people. The people in Logie district who wanted one-room houses would have to be provided for.

Bailie Buist thought they should reiterate their demand that so far as Dundee was concerned they must have a certain proportion of one-room houses.

Bailie Buist's suggestion was agreed to.

The plans sent in by local architects were then examined.

Mr. Barnes, referring to the position of the beds, said they were all marked as against the wall. The head should be against the wall, with a space on each side.

The City Engineer said the people would put them where they liked.

Mr. Spence: If you put the beds against the wall they will hold more.

Aviation Field Named for the Late Major John Purroy Mitchel

Four new aviation fields are to be opened on Long Island, each to be named after an aviator who has died in the service. The field at Mineola will be named Mitchel Field, after the late Major Mitchel; the others, it is announced, will be named after Major Raoul Lufbery, Lt. Col. Henry J. Damm and Lt. Col. C. G. Chapman.

These fields will each have the necessary quarters, hangars and all the various buildings that are a part of the modern aviation field, which is also a training school for flyers.

Estates to be Taxed 50%

An increase of 50 per cent in the taxes on estates has been agreed upon, tentatively by the Ways and Means Committee as a part of the new revenue bill. It is estimated by Treasury experts that the new taxes will yield about \$100,000,000 in revenue. The estate taxes under the existing law are estimated to produce about \$70,000,000 for the fiscal year ending June 30, 1919.

The 50 per cent increase will be made to apply to all estates up to \$8,000,000. On estates exceeding \$8,000,000 and not exceeding \$10,000,000 the rate agreed upon to-day is 35 per cent, instead of 22 under the present law, while on estates exceeding \$10,000,000 the new rate would be 40 per cent instead of the 25 per cent now levied.

The exemption of \$50,000 on estates of residents of the United States would be allowed to remain as under the present law.

Bordeaux to Erect Permanent Memorial to United States

The Mayor of Bordeaux has proposed to the Municipal Council a plan for a permanent memorial of America's aid in the war. He suggests that a replica of Bartholdi's Statue of Liberty be erected in the estuary of the Gironde River.

Lumber Cut for the United States for the Year 1917

A total computed lumber cut for the United States in 1917 of 35,831,239,000 feet is announced by the Forest Service. This figure is based on reports received up to May 15 from 16,408 sawmills out of the 24,815 believed to have operated last year. It is estimated that the actual cut in 1917, on the basis of compiled figures, was approximately 10 per cent less than the production in 1916.

The falling off in lumber production during the past year is attributed principally to largely decreased private building operations, the scarcity of labor in connection with small operations, transportation difficulties, curtailment of demand on the part of wood-using industries, and a more or less general dislocation of lumber distribution through ordinary channels of trade. A considerable portion of the total quantity produced was utilized in meeting the exceptional demands for government construction and other war emergency projects, including ship material.

The State of Washington was the largest producer, with a lumber cut of 4,570,000,000 feet; Louisiana was second with 4,210,000,000 feet, and Oregon third with 2,585,000,000 feet, placing in the fourth position Mississippi with a cut of 2,425,000,000 feet.

Southern yellow pine, with a total of 13,539,464,000 feet, forms 37.7 per cent of the total cut. Douglas fir, its nearest competitor, is credited with 5,585,000,000 feet. White oak and white pine are each credited with 2,250,000,000 feet.

The number of mills in operation reporting in 1917 was smaller than for the two preceding years.

A comparison of the computed cut for 1917 with the total cut of the previous year in the larger producing regions shows a decrease of about 10 per cent in the Southern yellow pine group of States, a decrease of 25 per cent in the North Carolina pine group, and a decrease of 11 per cent in the Lake States. On the other hand, there was an increase in production of 3 per cent in Oregon and Washington.

Desert Reclamation

England is already planning to reclaim the deserts of Mesopotamia by irrigation on so large a scale as to dwarf everything of the kind hitherto conceived. When the project is completed half the present population of the British Isles could be supported on the reclaimed lands. The work will involve extensive harbor development and railway construction.

Electrically Welded Ships

News from London that a British yard has launched the first electrically welded steel ship, has been received in Washington with especial interest, because the first American vessel of the same type is soon to be started at Newark, N. J. Machinery required for welding the ship plates is approaching completion, after which the hull can be turned out in short order.

It is estimated that the time of construction will be cut 30 per cent when the method is developed fully, as no rivets will be required. Plates for the ship will be hung together by an electrical "spot welder," and then the real welding will begin, the electric flame melting the plates together along the seams, until the hull is complete.

Essentials and Non-essentials

There have been rumors ever since this country entered the war that industry is to be divided into "essential" and "non-essential" from the point of view of the contribution which they are capable of making toward winning the war.

These rumors have caused unrest among both employers and employees. Business does not take kindly to unsettled conditions. While there must necessarily be more or less uncertainty in the existing situation, needless additions to the uncertainties that are unavoidable are to be regretted.

The announcement made by the War Industries Board that it has no intention of attempting to classify industries upon the "essential" or "non-essential" basis will tend to stabilize industry and relieve business anxiety.

Building Activity in Principal New York State Cities

Reports of building activity in New York State for May, 1918, in first and second-class cities, show that the estimated cost of building work authorized amounted to \$9,200,000. This is an increase of 8 per cent over April, but contrasted with May of a year ago, it is a decrease of 16 per cent. The costs of building work reported in May, 1917, 1916, and 1915 were respectively 11, 33 and 29 millions of dollars. The boroughs of Brooklyn and Queens filed plans for May, 1918, showing larger expenditures than in May, 1917, as did also the cities of Schenectady and Yonkers. The boroughs of Manhattan, Bronx and Queens show larger operations in May, 1918, than in April, 1918, as did likewise the cities of Schenectady, Syracuse and Troy.

Halifax, N. S., to Build Great Numbers of Concrete Houses

It is stated that the Halifax, N. S., Relief Committee has let the preliminary contracts for the construction of 1000 concrete houses.

These houses are to be built in the fireproof zone as part of \$15,000,000 reconstruction work, for which the United States, Canada and England each furnish \$5,000,000. Thirty thousand barrels of Canada Portland cement have been bought. The walls are to be of hydro-stone block and equipment has been purchased.

The work at Morgan Park, Duluth, illustrated in *THE AMERICAN ARCHITECT*, issue of June 5, is said to have formed a basis of the present plans, which may influence housing in the United States.

A Coating for Concrete Ships

Discovery of a new protective coating, which is expected to make concrete ships as durable as steel, has been announced by the Shipping Board.

R. J. Wig, chief of the concrete ship division, is quoted as stating:

"Engineers studying concrete construction are becoming more and more enthusiastic over the future of concrete ships. From our comprehensive tests of seawater we are assured that such vessels will last a minimum of several years without any protection. Application of well-known protective coatings makes certain an extended life of several years addition, and with the further development of protective means which we have discovered I believe the concrete ship can be made as permanent as steel, if not more so."

The United States Listing War Plants' Labor Needs

It having developed that there are more places for unskilled labor than there are workers to fill them, the various employment offices under the control of the Government have been instructed to report to Washington the exact number of unskilled laborers required by firms engaged in war work. This is in conformity with the recent order issued by the President that all application for labor required by war plants must come through no agency except that of the United States employment office. Communication committees have been formed in every district and these will gather together all details of labor affecting war work and report them to the Government employment office.

Shut-downs Expected in Steel Industry

The Government's program for the conduct of the war, the building of ships, and the addition of large facilities to the railroads is calling for more and more steel as time passes. The existence of substantial amounts of steel in the hands of manufacturers has so far prevented rapid shut-downs of plants in non-essential lines, but the trade reports this week forecast some radical readjustments of the sort in the next few months.

"It is now realized that the ship program is to be increased next year," *The Iron Age* says, "beyond anything yet believed; that railroad purchases must far exceed those for 1918 after years of starvation buying, and that shell steel must be furnished at a 5,000,000-ton rate. Moreover, the strain great crops have always put upon iron and steel capacity is also to be reckoned with.

"In its third warning to consumers of steel within three months the War Industries Board puts the needs of the second half of the year for war and essential industries at 20,000,000 tons of finished steel products, or 3,500,000 tons more than the expected output. A sharp challenge of the 20,000,000-ton estimate came from automobile interests, accompanied by a call for a definite assurance as to steel supply, even on a reduced scale. No assurance has been given, nor can it be given, the most certain thing in the prospect being that the use of steel for war purposes will increase, while production is less likely to increase."

The Housing Problem in Germany

According to a report compiled by the United States Department of Labor, building in the great German cities has practically ceased. During 1916 the total number of houses erected in the forty-five largest cities in Germany was only 1009, and in 1917 even a smaller number were built. In important cities such as Berlin, Hamburg and Frankfurt building has long since ceased, and it is only in the large industrial towns where war preparation overshadows everything else that there has been construction of any kind. In Essen and Kiel, for example, there is a very pronounced shortage of housing, while in Berlin and Hamburg the depletion of the population by the war is so great that these cities have not really suffered from a housing shortage, though they have fewer and poorer accommodations than formerly. The irregular distribution of the population in Germany, owing to the fact that industrial towns are practically at the

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point of congestion, leaves the great cities where they are not featuring war activities but partly filled. In Aix-La-Chapelle one house in twelve is idle, in Berlin one in sixteen, while in Hamburg, which before the war was a rapidly expanding industrial center, 6 per cent of the houses are said to be vacant.

No new houses are built, and old ones wear out, but the population is being depleted faster than the houses.

Government to Control Cape Cod Canal

To protect the coal supply going into New England from Southern ports from the menace of submarine operations off the New England coast, control and operation of the Cape Cod Canal is to be taken over by the Government.

The canal will be operated by the Railroad Administration as a part of the Administration's canal system.

This canal is seven miles long and connects Cape Cod and Buzzard's Bay. It has a depth of 25 feet, permitting movement of large coal vessels and thus not only protecting them from attack, but also shortening their journey and saving them from the risks of storms in rounding Nantucket shoals and beating up the Massachusetts coast.

Melrose Abbey Gift to British Nation

By the generous act of the Duke of Buccleuch, Melrose Abbey, famed in song and story, is to pass into the hands of the British nation. The Buccleuch family have owned this historic estate since 1772 and have taken the greatest possible care of it, expending a large amount in its preservation. In its earlier history it was less fortunate, and it has so many times been plundered and assaulted from various motives of utilization, religion and robbery that it is surprising that it exists at all. It possesses considerable interest as a relic of the late Gothic architecture of Scotland, and among its historic associations are that it is the burial place of Alexander II. of the heart of Bruce, of Michael Scott and many of the Douglas family. It is further remarkable as one of the finest examples of mediæval British stonework in existence.

Housing for Farm Labor

If, as it is claimed, food will be a large factor in winning the war, it will be necessary to give as careful consideration to the housing of farm laborers as it has been to the shipbuilding or munition workers. Like every other employer of

labor, the farmer must depend more and more upon married men and men of mature years. A man of family who has the interest of those dependent upon him at heart will not accept permanent employment where he cannot have his family with him. It thus becomes necessary to provide better accommodations for farm hands; in fact, in the providing of adequate housing there has developed a problem second only to the industrial housing operations now going forward under the Government.

Cliff Ruins in Colorado and Utah

Professor J. Walter Fewkes, who for years has been connected with the development of the cliff ruins in Colorado and Utah, has issued a pamphlet through the Smithsonian Institution on the various forms of towers found in the cliff ruins of southwestern Colorado and southeastern Utah.

Professor Fewkes finds that, in general, there are five classes of towers constructed by that race. Presumably, the cliff dwellers developed their buildings, as have other races, from the simple to the complex. The simplest forms are the plain round towers which are often found among the ruins. These towers are characteristic of all cliff ruins, their masonry being excellent. They vary in size and height, some of them being three stories high. The best examples of the round tower, according to Mr. Fewkes, are to be found in the Hovenweep district, Utah, where the buildings are in a remarkable state of preservation.

The Real Grand Canyon

Most visitors to the Grand Canyon see it only from the rim; a small proportion take the extra day to descend to the river, and still fewer the two days necessary to spend a night in its depths. But it is necessary to see the canyon from within if one is to have even a superficial idea of it. The rim view is noble in the extreme; it is inspiring, to some even terrifying; to all it affords an emotional experience whose memory remains for a lifetime. But, after all, it presents only one aspect of very many, for the great gulf offers sensations of infinite variety.

For this reason there is probably no great place in the world seen by so many and known to so few. The supremacy of the Grand Canyon in the world's scenic gallery is universally acknowledged. Not far from a hundred thousand persons visit it annually. The boundaries proposed for the national park which Congress is now considering inclose about a thousand square miles of a magnificence which phrase and photograph fail even to suggest.

Fifteen Gun Plants Completed and Producing Cannon

SIXTEENTH PLANT 85 PER CENT COMPLETED

The War Department authorizes the following statement from the Ordnance Department:

The Army Ordnance Department announces the completion of fifteen of the sixteen gun plants for the forging and machining of cannon. The sixteenth plant is 85 per cent complete.

In the erection of these plants the Government has expended \$34,768,297.

It was necessary to provide these plants as a preliminary to the production of but one part of a complete gun which includes, besides the body or barrel, a carriage and a complicated recuperator and recoil system.

All sixteen plants now are producing cannon or cannon forgings for mobile artillery from 1½ in. (the 37 mm. "anti-tank gun") to 10 in.

No percentages of completion and installation of machinery on the Neville Island plant of the United States Steel Corporation, the \$30,000,000 project for the manufacture of siege guns, funds for which became available last month, are given in the Ordnance announcement.

Processes in the forging and machining of cannon so differ from the ordinary commercial practices of peace times in this country that the Government was obliged to build the sixteen plants from the ground up and to equip them with machinery, much of which had to be designed especially for this work.

The production of cannon involved the creation of a new industry. The Midvale and Bethlehem companies were the only plants of any size outside of Government arsenals available for the manufacture of Army guns in quantities, and Midvale was largely utilized for Navy work.

The requirements for ordnance were so great that Midvale and Bethlehem could not take care of the production needed. It was necessary for the Army Ordnance Department immediately to erect and equip a large number of new plants for cannon. The organization and facilities for these were taken from factories that had been successfully engaged in the production of various types of equipment ranging from railway appliances to high-grade machine tools.

The Ordnance Department announcement shows that five of the sixteen plants have their machinery 100 per cent installed and 100 per cent in operation. Five others are 90 per cent or more complete as to installation of machinery, while only two are as low as 65 per cent completed.

Memorial for Major Mitchel

A permanent organization, for the purpose of erecting a memorial to Major John Purroy Mitchel, has been effected in New York City. The *New York World*, which started a movement for a memorial fund immediately after Major Mitchel's death and which has collected more than \$20,000, has turned this over as the nucleus of a greater fund.

The memorial will be erected not only in appreciation of Major Mitchel's public service and sacrifice in military life, but also "in a spirit of gratitude for his splendid and tireless achievements in the fields of municipal progress while mayor of the city of New York."

Boston's Clean-Up Campaign

The City Council of Boston has set aside \$10,000 for tearing down old dilapidated buildings which constitute a menace to the health of their community. An annual clean-up campaign takes place in that city, and it is said that in the last four years the building department has removed 2417 old and dilapidated structures.

A similar campaign in other cities might be conducted to good advantage, either effecting the removal or repair of such buildings as are objectionable, both aesthetically and from the standpoint of sanitation and health.

Trading With the Enemy

Don't trade with the enemy. Don't allow swindlers of a type so abject as to be unbelievable to cozen you out of your Liberty Bond in exchange for "wild cat" securities of any kind.

This form of swindling has become so pronounced as to cause the Chamber of Commerce of the United States to ask for the widest publicity of the following official warning. It reads:

A warning to the public against Liberty Bond swindlers is sent out for wide distribution by the Chamber of Commerce of the United States. Publication of the warning is prompted by reports that bond-holders in many parts of the country have been approached by persons offering to trade for the bonds stocks of doubtful value. In most instances the bond-holders have been told that the stocks offered in exchange for bonds are absolutely safe and that they will pay far greater returns than do the Liberty Bonds.

The warning:

"Don't be swindled out of your Liberty Bond.

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"If anyone tries to trade you out of your Liberty Bond, don't trade.

"If tempted to consider a trade, take the trader to the nearest bank and ask the banker to check the value of the thing offered.

"If you must absolutely have the money your bond can always be sold for cash in the open market and the daily papers will tell you what it is worth.

"Keep your bond until the end of the war. Go without something you need rather than sell it. Your bond is your substitute on the fighting front. To part with it takes you out of the fight.

"Instead of selling the bond you own buy another one to keep the first one company.

"Liberty Bonds are the best security on earth to-day.

"They are the promise of the United States Government to pay you interest twice a year and to pay the face value of the bonds when due. Their safety is the reason they carry a low rate of interest. Detach each coupon on the date it bears, take it to a bank and deposit it to your account, or draw the cash value.

"Register your bonds and keep them where they cannot be lost, stolen or destroyed. Go to a bank for information—many banks offer facilities for safe keeping of bonds. To lose an unregistered bond is the same as to lose that amount of money."

"A Primrose by the River's Brim"

And now everybody is coming round to the view that any means of democratizing art by multiplying copies of good work should be welcomed rather than repudiated, writes the editor of *The Architects' and Builders' Journal* of London. Always, of course, the copy must lose something of the spirit of the original; but surely that is a minor consideration. Multiplication of copies will go on, and one's chief concern is the design or the choice of originals. If artists austere refrain from assisting in that choice, they do the public a disservice, and risk a presumption of priggishness. Architects are often in doubt whether to specify machine-made decoration—woodwork, for instance—or to adopt the alternative of a plain surface where cost prohibits hand-made art. Conscience, in such cases, suggests that machine-made art is a sham—is something pretending to be other than what it is. This, we think, is to push principle too far, and to raise an unwarrantable assumption of fraud. A piece of good decoration is entirely innocent of false pretences, nor are we wholly justified in prying into its pedigree. If it is beautiful, that is its justification. Most of its beholders will be content to enjoy it, without for a moment troubling about how it was produced—

whether it was cut to pattern in a cunningly devised machine, or whether it was carved by hand. They are not fastidious artists, but observers after the order of Peter Bell; and Peter, one suspects, got more enjoyment out of the primrose than the egoistic poet lays to his credit.

North Dakota Architects Meet

The semi-annual meeting of the North Dakota Association of Architects was held July 13 at Grand Forks. George Hancock of Fargo presided.

In his address Mr. Hancock commented on the fact that architects were prone to talk only to themselves through the medium of professional and trade journals. These seldom or never reached the eye of the general public or the prospective client. Accordingly the value of their services was not recognized as it would be if the truth reached the public through well directed publicity. The public now remained unprotected from the trickery of the charlatans untrained in architecture who do their work by proxy and care only for the pecuniary results of their activity.

The address also included remarks on the history of architecture.

The meeting was well attended and provided a varied and interesting program. A banquet, given by the Grand Forks Builders' and Traders' Exchange, followed.

James Craig Nicoll Dead

James Craig Nicoll, founder of the American Water Color Society and one of America's noted water colorists, died at his home at Norwalk, Conn., July 26th, in his seventy-first year.

Mr. Nicoll was a life member of the National Academy of Design, and was at one time its secretary; he was for ten years secretary of the American Water Color Society, a member and at one time president of the Artists' Fund Society, and various other art organizations in New York City, including the Etching Club, claimed him as member. His work has been exhibited in a number of cities in this country and in Europe.

Architects Dissolve Partnership

The architectural and engineering firm of Nevins & Park, 1708 Hoge Building, Seattle, Wash., has been dissolved. Earl Park, junior member of the concern, has accepted a position in the offices of Bebb & Gould, architects, in which offices Mr. Park was formerly employed.

Architect J. R. Nevins will continue to maintain offices at the present location.

Department of Architectural Engineering

Fire Prevention During Construction

IN general terms, an architect contracts with an owner to produce certain plans and specifications for a specified building and to superintend its construction by others. This supervision is of two kinds, incidental and continuous, its kind being defined in the contract. No contract for service of this kind can specifically mention all of the obligations that are germane to a responsibility of this kind and there are some things that are of the nature of moral obligations which are beyond the specific and implied stipulations of the contract.

The ultimate intention of the contracts between the owner and the architect and the owner and the constructor is that there shall be delivered to the owner, within a specified period of time, a completed building ready for occupancy. Any failure to deliver, due to preventable causes, is generally considered to be on the part of the constructor, although the conscientious architect fully realizes his portion in a divided responsibility that is difficult of definition.

There are many things that retard the construction of a building for which the architect is jointly responsible with the contractor and in some aspects of the matter his responsibility may be greater. The viewpoint of the contractor is too apt to be limited to the one thing of properly constructing the building with a profit to himself, and his superintendents and foremen are so busily engaged with the problem of securing materials and labor and construction activities that they are not to be altogether censured if they overlook some items, the importance of which is not emphasized by the contractor or the architect. Their work is one of infinite detail and activity in coping with ever-present and changing demands.

The architect's supervision has no control over the constructive processes in detail but rather with its results, and this lack of financial responsibility, which the contractor's organization bears, should enable him to study conditions of importance both to his client and to the contractor. Continuous

supervision by the architect must of necessity be delegated to one in the architect's organization and all too often is so delegated to a person lacking in knowledge of the technique of construction and of trained powers of observation with its attendant judgment or common sense.

A fire loss during construction is generally a preventable loss and delay, and when it is preventable it represents a waste of material and labor that can never be replaced. A waste has now become to be considered a reprehensible thing and contrary to the welfare of society, and while it is true that fire insurance liquidates the material loss, every such expense is a tax on each purchaser of fire insurance. It follows then that those who are responsible for preventable losses of this kind are detrimental to public welfare.

It is therefore apparent that the architectural supervision of construction is, in a large measure, responsible for such losses and it is to emphasize this fact that an illustration is given later. It should be very strongly impressed on the supervisors, both of the architectural and contracting organizations, that there is a responsibility resting on them both as to fire loss and safety to life; that seeing without seeing and thinking is utterly inexcusable. Those who have experience in this work well remember many instances where superintendents of construction carefully avoid hazards to personal safety, because they are free to do so, and forget that the workman who is bearing a burden has not that freedom to protect himself. For that reason slight obstructions are left in the pathways to be a source of danger to others. Only a superintendent who has worked at some craft is usually able to appreciate the dangers to workers. The same thing may be said to apply to fire prevention; the superintendent is in contact with the hazards continuously and even if they are noted and known they are not corrected, on the supposition that the responsibility is to the constructor and possible loss covered by insurance.

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Fire prevention during construction has been very ably discussed by H. L. Miner, Fire Protection Engineer, E. I. du Pont de Nemours and Company, in the April, 1918, *Quarterly* of the N. F. P. A., and reprinted by that association. This article should be in the office of every architect, engineer

and vated wooden floor construction and the result was a fire loss of about \$400,000. In this case the laborers were not to be censured because they are not expected to have judgment, but a lack of intelligent supervision is apparent. Other cases as flagrant are of constant occurrence and indicate that little thought is given to these matters.

It is customary to build protection over sidewalks in front of buildings under construction. These are used for the storage of material on the roof of the same and the elevated floor affords passage over the open sidewalk space below, and serves the primary purpose of protecting pedestrians during the construction of the building. That such a construction can become a serious fire hazard is evidenced by the fire which occurred during the evening of April 8, 1918, in such a protection at the Pennsylvania Hotel, now under con-



Fig. 1—West Thirty-third Street front of Pennsylvania Hotel, looking west, showing general view of building and sidewalk protection

and contractor and the field superintendents and foremen should be required to read it at stated intervals, as a matter of very necessary education. The paper is divided into two parts, the first of which treats of conditions which may constitute a hazard and the second treats of methods of preventing and extinguishing fires. The hazards are grouped into the storage of inflammable materials; tools such as gasoline torches, soldering pots, tar pots and forges; lighting by lanterns, electricity or acetylene; power generated by steam boilers, gas, gasoline or electric engines; heating by stoves, salamanders or steam, thawing frozen materials; fuel, such as coal, gas or oil; housekeeping or removal of rubbish, matches, smoking, temporary structures and other items. The various fire protective appliances are described and their several uses explained.

Preventable destruction of construction work is illustrated by a striking example in an Eastern city last winter. Some laborers undertook to thaw out some sand and gravel which was stored on an ele-



Fig. 2—Interior view of sidewalk protection. About midway between the walk and the underside of the material platform at the top may be seen a few remaining horizontal rafters of the rainshield over the walk. This shield and a sheathing at the side next the building were both of light boards and contributed chiefly to the rapid spread of the fire and the intense heat

struction, on West 32d and 33d Streets and Seventh Avenue in New York City. This protection was built on three sides of the building, the fire occurring on the 33d Street side and extending a distance of about 225 feet from the eastern end of the building.

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The upper platform of the protection which served as the material platform is about 16 ft. 6 in. above grade level and is constructed of 3 in. planks on 3 x 10 joists about 20 in. on centers. These joists rested on 10 x 12 longitudinal girders, supported on 10 x 12 posts, 12 ft. on centers. The sidewalk platform is about 2 ft. 6 in. above grade and consists of a 2 in. plank floor on 3 x 10 joists

of the partition and the roof. There are unprotected openings from the basement of the hotel to the street between the building front and the partition and under the sidewalk platform to the street.



Fig. 3—View showing the spalling of the limestone veneering. Fourteen of these piers between windows and doors opposite the sidewalk protection were damaged

about 30 in. on centers. The protection is 15 ft. wide and extends over the curb line about 3 ft., the inner line of the platform being about 2 ft. 6 in. from the face of the building. Along the inner line of the sidewalk platform is a partition about 6 ft. high and made of $\frac{7}{8}$ in. boards. About 8 ft. above the sidewalk platform is constructed a roof made of tar paper, $\frac{7}{8}$ in. boards and 2 x 4 rafters, there being a space of about 2 ft. between the top

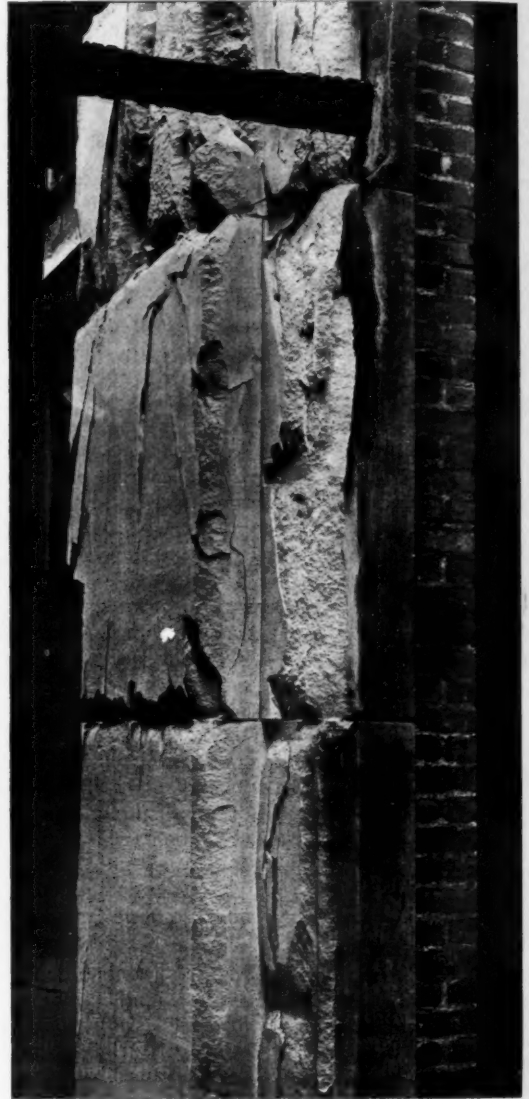


Fig. 4—Another view of the damaged limestone veneering on one of the piers

The fire was discovered about 8.34 p. m. in the sidewalk protection by a U. S. sailor who notified Hook and Ladder Co. No. 24, located on West 33d Street, some two hundred feet east of the hotel building. This company responded immediately

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but before they reached the fire the structure was blazing fiercely. An alarm was sent in from the box on Seventh Avenue and West 33d Street, by the captain of the above Hook and Ladder Co., at 8.35 p. m. There were two watchmen and a few laborers inside of the hotel building, but as the fire originated outside of the building and apparently inside of the sidewalk protection it was not noticed by anyone in the building.

It appears that the fire was not discovered until it had done so much damage as to make it difficult to ascertain the exact cause. Several suggestions have been made as to possible causes, one, that it may have been of electrical origin, and the other, that it was due to the ignition of escaping gas. Nothing definite has as yet been secured as to either of these possibilities.

The first engine company arrived within two minutes after the first alarm. The fire spread very rapidly due mainly to the light roof and partition on the building side of the bridging; there was also a strong current of air through the unprotected openings around the protection from the basement of the hotel building. All of the fire apparatus which answered the first alarm arrived at Seventh Avenue and West 33d Street and it was impossible to pass the fire due to the intense heat. One of the companies went around the block so as to fight the fire from the easterly end. The sidewalk protection extends over into the roadway about three feet and the distance between it and the building line on the north side of the street is only about 42 ft. 6 in.

The fire was fought by the public fire department using the high pressure system. The men of the Hook and Ladder Co., which was first notified of the fire, proceeded with some difficulty to the inside of the building and manned a hose line which was supplied from the inside standpipe. The fire was fought from all sides, some lines being run through the building from West 32d Street, and was extinguished in about fifteen minutes after the engine companies began to work.

The damage consists of the destruction of the partition running parallel to the building and the light roof. The plank of the material platform and sidewalk was also damaged so that it had to be replaced. The heavy timbers were charred from one to two inches in depth but are still in use.

As was to be expected, the facing of the piers was damaged as a natural result of so intense a fire within 2 ft. 6 in. of it. While the fire was of short duration the damage to the limestone veneering was such as to necessitate its replacement. The application of water probably had the effect of aiding in the disintegration noted. This veneering was damaged up to the third floor, a distance of about 50

feet. It is apparent that the old-fashioned specification requiring limestone to be laid on its natural bed was either not so written or it was disregarded. The damage to the lower stone in Fig. 4 indicates that the grain of the stone was perpendicular to its face, resulting in damage to its edges only. As no material is immune from the effects of fire, the possibility of damage from the burning of temporary construction should be carefully avoided.

The wood trim such as doors, cornices and window frames of the fronts of five buildings across the street was damaged by the fire. Some of the contents of these buildings were damaged as well as a few automobiles in the street.

From the hazard viewpoint this protection contained too much thin and unnecessary lumber. In many cities the material platform is made of two



Fig. 5—View showing the damage by fire to wooden doors, window frames and cornices on the fronts of buildings across the street from the fire

thicknesses of board with tar paper between and thus serves as a roof also. This, also permits the storage platform being lower and nearer the street grade. Where partitions are built they often extend to the material platform and are made of dressed and matched material, the wall, ceiling and posts exposed to the pedestrians being painted and the passageway lighted by electric lights. In the case of the protection at the Pennsylvania Hotel the lumber was all rough and with open joints and the partition facing the sidewalk was and is covered with theatrical posters which, in themselves, furnish a hazard by having matches struck on them and are otherwise unsightly.

This fire was reported to the New York Board of Fire Underwriters by F. J. T. Stewart, superintendent of its Bureau of Surveys, to whom acknowledgment is made for the use of the illustrations here shown.

Cement Floor Finishes

IT is through contact with things that an unconscious valuation is put on their characteristics. This is notably true of steps entering into buildings that are used by great multitudes of people and also of the floors over which these people pass. The selection of a material for these purposes is very often dictated by its cost rather than its wearing value. For this reason local materials are often used, more especially stone. All are familiar with the worn surfaces of various kinds of limestone, marbles and sandstones, and on appraisal find that the granites are the most satisfactory of all natural materials, considered for their quality of resistance to abrasion.

Of artificial products some of the encaustic tiles probably resist abrasion to a greater extent than any other flooring medium. Consideration for cost very often precludes the use of this material and resort is made to the use of cement finishes. The cheapness of this kind of finish has caused its extensive use since the development of the manufacturing of Portland cement in this country. The finishing of concrete floors has always been a source of trouble to architects and engineers to some extent and a successful piece of work was only known after it was executed. In other words, a finish is not a standard product. This will probably always be the case because it is a product made of variable materials, all except the cement, and of human beings who have their natural limitations.

Finishes are of two kinds; applied and monolithic. The applied finishes are made of a mortar and applied to the concrete base either before it has set or after the base has become thoroughly hardened. In either case the successful making of a finish requires great care in its application, proper materials and preparation of the concrete base.

Any bed of wet concrete will have on its top surface a layer of laitance or scum which consists of the finest matter in the cement and silt or clay from the aggregates. The composition of this scum is similar to that of cement, but it never acquires much strength. The presence of a layer of laitance in a mass of concrete, occurring where the installation is interrupted, is a distinct source of weakness, as it prevents the complete adhesion of the superimposed mass of concrete. This impalpably fine portion of the cement is of great value in the mortar which binds the aggregate together and its presence on the top surface decreases the strength of the concrete below. To keep this portion of the cement where it belongs should be the object of the constructor.

In our great haste to place a large yardage of concrete per hour many of the essentials of making good concrete are neglected. In fact, the boastful statement that an organization and its equipment placed an extremely large amount of concrete within a given time should be no recommendation to the thoughtful architect or engineer. We are all apt to enthuse over the expedition or "efficiency" of the contractor who expedites for profit, or as often to make a record, forgetting that the only proper purpose of the operation is to secure good concrete which the owner has purchased and to which he is entitled. It is not the intention to discuss in detail the evils of excess water in concrete at this time, but rather to call attention to the effect it has on the satisfactory finishing of a floor. Assuming that the presence of laitance is an undesirable thing, the problem is how to overcome its evil effects.

An applied finish is a mortar made of cement and an aggregate in varying proportions. This finish varies in thickness from one-half to as much as two inches or more in thickness, according to the service to be performed. When this finish is to be applied to a fresh concrete base, the base is allowed to set to a fair degree of hardness, permitting mechanics to work on it. If the base is made of sloppy and overwet concrete there is bound to be a film of laitance on its top which will make trouble. Some contractors have overcome this trouble by sopping up this excess water with burlap or jute bagging, with the same effect as is secured by the use of blotting paper. This not only removes the surplus water, but also the laitance with it, thus providing a suitable bed on which to deposit the finish. This method undoubtedly adds to the expense of construction, but the added assurance of a satisfactory finish is well worth the cost. This would only be necessary in connection with "poured" floor slabs, as floors and walks built on the ground are made of a stiffer and more dry concrete.

It often happens that the concrete base may be thoroughly hard before the finish is applied. In this case there is the film of laitance and accumulated dust and other foreign matter to contend with. Unless removed this forms an effective barrier to the adhesion of the finish to the base. This can be removed by two means. The ordinary way is to pick off the top surface, applying wire brushes and then washing. This removal must be deep enough to furnish a surface of clean, sound concrete and aggregates. This depth will vary with the thickness

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of the slab, increasing with the thickness and the amount of excess water. The use of hydrochloric acid is not recommended for this purpose. If used in amount sufficient to remove the scum, it would penetrate the porous concrete to such a degree as to impair its upper surface.

Probably the most effective method of removing this film is by using a steam jet. This is done by means of conducting the steam through a pipe or steam hose to the place to be cleaned. On the end of the hose a five-eighths inch pipe from four to six feet long is attached, serving as a nozzle. The end of the pipe is flattened out, leaving an orifice about one-sixteenth inch wide by about one and three-quarters inches long. This furnishes a fan-shaped jet of steam and with a boiler pressure of at least eighty pounds provides a most effective means for cleaning. By such a steam jet the laitance and the gravel or other aggregate is blown loose from the concrete bed. A water hose under good pressure and brooms are used to remove the displaced material. This operation should be performed twice, using great care to remove the dislodged particles entirely from the face of the slab. The removal of the fine aggregate provides splendid keys for the mortar finish.

The finishing mortar should be quite dry and its initial troweling be done under sufficient pressure to remove the air bubbles that are to be found between it and the concrete bed. This will at the same time compact the mortar. There is danger from too much troweling, as it causes the excess water to come to the surface, bringing with it the finer particles of cement and causing a film of laitance to develop, which will make a dusty and easily abraded floor. The amount of water used is the vital factor in the whole operation and it is very apt to be used to excess, as it is much easier to finish a wet than a properly dry mortar.

The aggregate used in the mortar will vary with the locality. A sand of uniform size will not make as good an aggregate as a sand made up of various sized units, such as torpedo sand. Uniform size means a maximum of voids requiring more cement and a weaker mortar. The best wearing mortar is made of crushed granite, including the finer particles. This is true, as granite resists abrasion better than any known material suitable for use as an aggregate. The use of granite, however, is naturally restricted to localities where the freight on this heavy material is not prohibitive. Next in favor is a thoroughly washed and well graded torpedo sand. This sand is procurable in many more localities than granite and makes a very desirable finish.

A monolithic finish is one that is applied to the top of the concrete slab in the form of a mixture

of dry cement and sand and troweled into the bed while it is still soft and plastic. This dry mixture is often made with an added amount of metallic hardener. A danger of this method of finishing is in the excess water in concrete carrying with it the laitance. Whether the added dry material can absorb this weak and valueless scum without detriment to itself is doubtful. It might be advisable to blot up this excess moisture with burlap as before suggested, and thus secure a better surface on which to work.

A monolithic finish, however, has no particular volume of substance in itself and can only provide a thin finished facing for the concrete bed. Its value then depends largely on the character of the upper part of the bed. If deposited by a spouting system there is great danger that the coarser aggregate will be at the bottom of the slab, with the lighter materials on top. The mortar for concrete, being amply strong for purely structural purposes, is hardly suitable for a wearing surface. A monolithic finish results in a thin coating of proper makeup applied on top of a weaker material and diluted by that weaker material, being incorporated in it by the troweling process. It may be claimed, on the contrary, that the better topping is forced into and thus incorporated with the weaker mortar of the concrete. In either case the effect is the same, resulting in a thin wearing surface as compared with an applied finish of definite and uniform thickness.

With this mode of finishing is developed the great danger of using excess quantities of dry cement to absorb the surplus water. The use of dry cement serves the one purpose of blotting up the water and results in a useless amount of cement, which is an element of weakness in many ways. Cement in itself has no wearing value, and unless it carries the proper amount of sand and other aggregate it is a distinct detriment. Its use in that way is the easiest means of disposing of the surplus water and is therefore the common method employed. Added to its uselessness is the troweling that its use necessitates and causing the further bringing up of the laitance and weaker portions of the mixture.

The fundamental difficulty in finishing floors appears to be the excess "speed-up" water that appeals to the contractor and which is so necessary to the operation of some methods of placing. Not only does this excess water seriously affect the finishing of the floor, but it also has a decidedly bad effect on the structural concrete itself. As investigations show us this danger it should receive the careful and thoughtful attention of the architect, the engineer and their field superintendents.

Misemployment of Engineers

THAT we are wasting trained engineers by drafting them as private soldiers, and are thereby repeating an error made in England early in the war and now bitterly deplored, is asserted in a recent press bulletin by the Engineering Council, a body representative of the chief engineering societies of the United States. This takes the form of an open letter to the Secretaries of War and the Navy and ends with a series of resolutions stating the opinion of the Council that as trained engineers are indispensable in war and in the war industries, such men of all ages should be enrolled and conserved for technical duties, being ultimately assigned to places in which their special qualifications are needed. The Council offers, "solely," as it says, "in a patriotic spirit of helpfulness," to assist the War and Navy Departments in locating and classifying such men, if its assistance be desired, provided these departments will give it the necessary facilities for collecting information about engineers now in the Army and Navy, or whose names are upon the selective draft lists. We read:

"Technical engineers of every branch of the profession who are taking part in the war activities of the Army and Navy are alarmed at the unfortunate waste of technical training caused by the drafting and enlisting of engineers for regular service with little or no regard for their technical attainments. These technically educated and experienced men are essential to the successful conduct of the war and cannot be replaced. There is continuing evidence that America is repeating in some measure England's mistake of sending technical men into the ranks when they should be carefully conserved for special duties in the fighting forces or on the technical staffs of the Army, the Navy, and the essential war industries.

"These facts have been forced upon the attention of engineers who have been co-operating with the Government through the Naval Consulting Board, the National Research Council, and Engineering Council. Upon these organizations requests have constantly been made for engineers, chemists, and other technical men for a great variety of military services. Thousands of names have thus been furnished to the Government departments and bureaus. The Engineering Council especially has devoted attention to this personnel work through its committee, known as the American Engineering Service, which has available classified lists of approximately 25,000 engineers, and, besides, unclassified lists of many more. It is from those lists, directly or in-

directly, that most of the names have been selected for war service.

"The Engineering Council was founded by the American Society of Civil Engineers, American Institute of Mining Engineers, American Society of Mechanical Engineers, and American Institute of Electrical Engineers, and other engineering societies are co-operating with it in this service, the total membership represented by these organizations being approximately fifty thousand. Already from 10 to 15 per cent of the members of these several organizations are in the uniformed services of the country, and it is safe to say that a large majority of their remaining members are in the Government civilian service or otherwise directly or indirectly engaged in the war. Engineers do not seek to avoid fighting, but earnestly desire to be given opportunities for fighting and other services in which they can be most effective and which cannot be performed by others.

"It is known that through the Committee on Classification of Personnel in the War Service Exchange (of the War Department) and some other ways, efforts are being made to counteract the tendencies toward the loss of our technical men in the ranks of the Army and Navy. It is believed, however, that these efforts are insufficient and that they should at once be supplemented by other stringent measures dealing with the subject in the Draft Boards and recruiting stations."

New Building Code for Wisconsin

The Industrial Commission of Wisconsin has proposed certain amendments to the state building code, which have been passed upon by a board of appeal.

One of the principal changes proposed in the building code is a requirement that the plans for all public buildings must be submitted to the industrial commission. Under the code as it now stands, only plans for schools and theaters are required to be submitted, although most architects in the state are now voluntarily sending plans for public buildings to the commission. Another important proposed new ruling is that prohibiting apartments in rear yards. In buildings used for garages, fireproof construction is required for the first time. In two-story school buildings having more than four class rooms on one floor, it is proposed that the first floor must be fireproof. Changes are also made with reference to artificial lighting in school class rooms, and as to the required thickness of fire escape material; also in the requirements as to the construction of theaters in small towns.

Book Notes

HEATING AND VENTILATION—By John R. Allen, Dean of the Department of Engineering and Architecture, University of Minnesota; M. Am. Soc. M. E., and J. H. Walker, Superintendent of Central Heating, The Detroit Edison Company, New York: McGraw-Hill Book Co., Inc. Cloth; 6 x 9 in.; pp. 268; illustrated, \$3.

HEATING and ventilation is a subject that still offers a broad field for the scientific investigator and the results of such investigations and their practical application are of value. The progress in this art is rapid and new material is of value, for the proper design and installation of all kinds of heating plants is a matter of great economic importance, more especially at this time. This book is written by a scientific investigator and a practical operating engineer, both well known to heating and ventilating engineers.

It includes eighteen chapters which cover the theory of heat, heat losses from buildings, all the methods of heating and the properties of steam, which form the basis of the succeeding chapters. Chapters on the construction and work performed by various kinds of radiators, boilers, pipes, fittings, valves and accessories describe the materials employed. The design of steam and hot water systems with details of piping and automatic temperature control comprise a working group of chapters. Chapters on air and its properties, ventilation, hot-air furnace heating, design of fan systems, air-washers and air conditioning and fan systems for various types of buildings cover the field of heating and ventilation by means of heated and conditioned air. The concluding chapter discusses central station heating, which is a subject of growing importance. The book is well illustrated and examples are given to explain many of the rules given. The appendix contains tables and charts necessary for the design of heating plants.

The book is well adapted to the use of architects, heating engineers and contractors and also for use as a textbook.

CONCRETE ENGINEERS' HANDBOOK: Data for the Design and Construction of Plain and Reinforced Concrete Structures—By George A. Hool, S. B., Professor of Structural Engineering, The University of Wisconsin, and Nathan C. Johnson, M. M. E., Consulting Concrete Engineer, New York City; assisted by S. C. Hollister, B. S., Research Engineer, Corrugated Bar Co.; with chapters by Harvey Whipple, Adelbert P. Mills, Walter S. Edge, A. G. Hillberg and Leslie H. Allen; New York: McGraw-Hill Book Co., Inc. Cloth; 6 x 9 in.; pp. 860; illustrated, \$5.

THIS book is well worth while and fulfils the requirements of occasional or constant use. It comprehends the entire scope of the reinforced concrete art, is modern and up to date in every respect and is a complete library in itself. It is divided into nineteen sections and five appendices. The materials and the methods of using them, construction plants and the making of floors, sidewalks and pavements include all of the information requisite for the contractor. The properties of mortar, plain and reinforced concrete; beams, slabs, columns, bending and direct stress and moments in rigid building frames are sections devoted to the theory of design and contain practical working tables and charts. The section on buildings is very complete and discusses in detail all of the structural parts of a building and includes descriptions and computation methods used in connection with all of the flat-slab systems, as well as the latest building ordinances and rulings for their use. Foundations, retaining wall, slab and girder bridges, concrete floors and abutments for steel bridges and arches are each given a section. Hydraulic structures, miscellaneous structures and estimating conclude the topics discussed. The illustrations are plentiful and well selected and with the tables and charts included leave nothing to be desired in this respect.

It will be seen that the book serves the requirements of each architectural and structural engineering specialist in a complete and comprehensive manner. The broad scope of the book is the result of the collaboration of seven well-known experts resulting in both a valuable work-day and reference book.

Industrial Information

War Industries Chairman

W. H. Foster, President of The General Fireproofing Company, has been elected chairman of the Youngstown, Ohio, division of the War Industries Commission.

This Commission, which has jurisdiction over the Shenango Valley, in which Sharon, Pa., is located, and the Mahoning Valley, in which are Youngstown, Niles and Warren, comprises four counties, *i. e.*, Mercer County, Pennsylvania; Mahoning, Trumbull and Columbiana Counties, Ohio. The operation of this Commission, which is organized along what is known as the Cleveland plan, and which is being extended throughout the country, will have far reaching effect on American manufacturers.

Since the purpose of the organization is to mobilize the industries of the country in order more efficiently to serve in the production of war materials, and to assist non-essential manufacturers to change over to an essential or war basis, thus enabling them to continue to keep their plants in operation and maintain organization throughout the period of the war, this plan is being fostered and encouraged by the Government.

New Era in Street Lighting

In the interests of scientific street illumination the Holophane Glass Company, 340 Madison Avenue, New York, has published a large book entitled "The New Era in Street Lighting." This book describes and illustrates the results of recent scientific research and shows how practically these results have been applied to street lighting. The application of these principles results in a system which meets the requirements of good service to a maximum extent, it is stated, at a minimum cost.

The application of the Holophane Refractor principles to street lighting is in itself valuable, and the

developments which the system has made possible are very interesting. Among other things this company has evolved really attractive simple designs for its lighting standards; has established a minimum of 15 feet for the mounting of its lights, while as great a height as 30 feet is recommended for the main business streets of larger towns.

To those not familiar with the Holophane Refractor system in its general principles this book should be of interest. It should also prove of special value at the present time because it explains what is meant by conservation in street lighting and shows how to effect marked economies, such as being able to reduce the energy consumption by one-half and obtain illumination as effective as was formerly possible.

This is the first book ever published giving a complete resumé of the recent progress in street lighting practice, and its publishers have spared no effort to make it comprehensive. A limited quantity of the books are available for distribution to engineers and city officials and may be obtained by addressing the Holophane Company.

Dry-cold Refrigeration

C. V. Hill & Company of Trenton, N. J., manufacture dry-cold refrigeration, for the home and for store and market purposes. The features of this company's product are to be found in the wide variety of designs and uses to which the refrigerators can be put, and in the thoroughly complete and scientific workmanship of their manufacture. For insulation all the walls are packed with high-grade mineral wool, six layers of paper and three thicknesses of lumber. The ice chambers are lined with heavy galvanized Toncan metal.

The company issues ample literature covering the purposes and possibilities of its refrigeration. This may be obtained upon request to the manufacturers.