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THE PRINCIPLES OF ARCHITECTURAL COMPOSITION

HOWARD ROBERTSON, PP.RIBA., ARA., SADG.

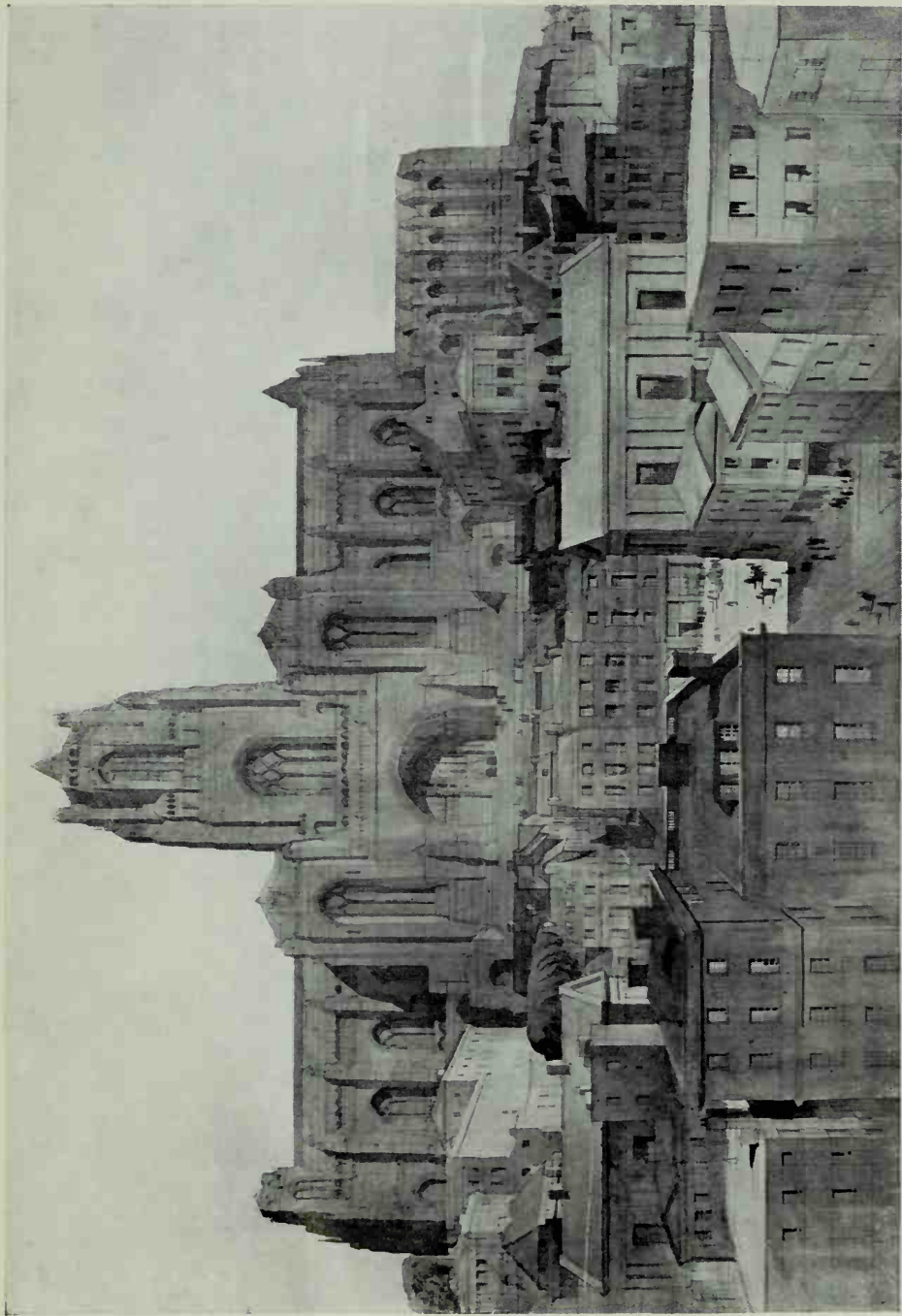


BEAUTY IN MASS—MOSQUE OF SULTAN AHMED, ISTANBUL



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**THE PRINCIPLES OF
ARCHITECTURAL COMPOSITION**



‘Unity — Proportion — Scale — Character’
Liverpool Cathedral, by Sir Giles Gilbert Scott, R.A.

From a drawing by Charles Gascoyne

Photo: Stewart Bale

THE PRINCIPLES
of
ARCHITECTURAL
COMPOSITION

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With a Foreword by
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Foreword

A SHORT work on the Principles of Architectural Composition fills a much dreaded gap in the scanty literature devoted to the theory of architecture, and in the hands of Mr. Robertson, a student of theory both in America and in Paris, the subject finds a worthy exponent.

Theory has been so little touched upon that the vocabulary of the subject is defective, and it is often necessary for the writer to coin words which only imperfectly convey an exact meaning, but with an increasing use the form of expression may become more universally accepted and will lighten thereby the work of future authors. Such words as '*contrast*,' '*composition*,' '*expression*,' '*concentration*,' '*positiveness*,' etc., have such varied meanings, as applied to architectural theory, that they can often only be explained by the context of the paper generally. Despite this limitation, the author has clearly and concisely explained many difficult abstract ideals, and the work is most admirable in its avoidance of abstruse argument.

Composition is the keystone of architectural design. Whilst primarily the plan of a building dominates its external expression, yet devoid of a sense of 'Composition' the external effect may be dull and uninteresting despite a good plan; and with a proper appreciation of contrasts and values of mass the same work may be masterly. Detail is secondary, and may

be bad or entirely omitted, on a building the mass of which is effective and even spectacular.

Broad lines in composition may be explained readily enough ; but the increasing subtlety made possible by a more thorough understanding, infinitely more pleasing and more stimulating to the imagination, is almost impossible to explain, except after progressive stages in the study of composition.

Composition or design in an abstract form is curiously universal in its fundamentals, both in sculpture, painting, and in architecture. The light and shade, or void and solid, or massing—whatever may be the word employed—mean very much the same thing in all these arts. Composition in Architecture at its best is a thorough understanding or feeling for the rhythmic value of the repetition of effects for the ‘ coup ’ of the utmost possible contrast of mass, of ornament, or of colour, and the correct gauging of the scale and incidentals necessary to complete a general scheme.

ROBERT ATKINSON

Preface

IN attempting to formulate some of the guiding principles of architectural design, I have been actuated by the desire to demonstrate that composition in architecture is susceptible of an analysis, through which can be isolated certain main factors which assist in, or militate against, the production of successful design. The bare acknowledgment that such factors exist will assist in creating a desire for a rational basis for architectural criticism amongst laymen and architects alike, and a conscious understanding of recognized principles will be a guide to the architect's creative instinct. The judgment of architectural design has been so largely a matter of individual taste and opinion that it has too often resulted in the acceptance of standards which are sometimes pitiably low ; and while personal preferences in design will always continue to exist, there must be, underlying these preferences, some common ground of agreement as regards the fundamental basis on which good composition depends.

There is no attempt in these notes to deal with the elements of buildings in detail, with such questions as those of colour and surface treatment, or with the practical requirements of various types of edifices. This field has been more or less adequately covered in a number of treatises, and other works on the subject are no doubt in course of preparation. In the matter of architectural design considered in the abstract, from

the point of view of composition, our bibliography is, however, far less complete.

I am indebted to all those speakers and writers with whose opinions I have been fortunate enough to come in contact ; the conclusions at which I have arrived are the result of discussion, reflection, and suggestion, consciously or unconsciously absorbed. It is, therefore, difficult to make due and adequate acknowledgment, but I would like particularly to mention my indebtedness to Mr. Trystan Edwards and Mr. Claude Bragdon, whose methods of treating the subject of architectural design appear to me to be the most susceptible of yielding valuable results in increasing an understanding of architecture, by analysis of principles rather than of the elements of building.

The section dealing with the Grammar of Design in Mr. Trystan Edwards' wholly interesting book, *The Things which are Seen*, has been largely responsible for encouraging me to attempt this analysis on similar lines, but which covers a rather different field ; and Mr. Claude Bragdon's *Beautiful Necessity* has been a source of inspiration and stimulus.

HOWARD ROBERTSON

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Contents

	PAGE
FOREWORD - - - - -	v
PREFACE - - - - -	vii
CONTENTS - - - - -	ix
LIST OF ILLUSTRATIONS - - - - -	x
 CHAPTER	
I. THE CONSIDERATION OF UNITY - - - - -	1
II. THE COMPOSITION OF MASSES - - - - -	18
III. THE ELEMENT OF CONTRAST - - - - -	26
IV. CONTRAST IN FORM AND MASS - - - - -	38
V. SECONDARY PRINCIPLES - - - - -	51
VI. THE EXPRESSION OF CHARACTER IN DESIGN - - - - -	65
VII. PROPORTIONS IN DETAIL - - - - -	77
VIII. SCALE - - - - -	92
IX. COMPOSITION OF THE PLAN - - - - -	100
X. THE RELATION BETWEEN PLAN AND ELEVATION - - - - -	127
XI. THE EXPRESSION OF FUNCTION - - - - -	140
XII. HINTS TO STUDENTS ON THE ARCHITECTURAL PROGRAMME AND A METHOD OF WORKING - - - - -	149
XIII. CONCLUSION (1954) - - - - -	155
BIBLIOGRAPHY - - - - -	159
INDEX - - - - -	160

Illustrations

FIGURES		PAGE
1, 2, 3, 4.	The Destruction of Unity by Competing Dualities - -	7
5, 6.	Effect of Duality lessened where shapes are less strongly marked - - - - -	8
7, 8.	Duality lessened by differences of tone and texture - -	8
9, 10.	Competition and destruction of Unity through equalities in a plural composition - - - - -	9
11.	Tendency towards Duality in the Treasurer's House, York -	10
12.	The Doge's Palace, Venice.—Competition between ground and first stories lessened by contrast of treatment - -	10
13.	The Station, Tours. A marked Duality - - - -	10
14.	King's Cross Station, London. A more successful attempt to overcome Duality - - - - -	10
15.	Minaret of the Grand Mosque, Kairouan. The apparent proportions of door opening affected by surrounding crushing mass - - - - -	11
16.	Basilica di S. Antonio, Padua. The verticality of the doorway accentuated by accompanying verticals - - - -	11
17.	Tendency towards Duality in proportion of window increased by conditions of its setting - - - - -	12
18.	Duality - - - - -	14
19.	Duality lessened by focussing interest towards centre - -	14
20.	Unity suggested by a 'link' element - - - - -	14
21.	Complete Unity - - - - -	14
22.	The two original elements unified by the introduction of a Dominant third element - - - - -	14
23, 24, 25.	The use of the Dominant to provide Unity in compositions of Plural elements - - - - -	16
26.	A 'balanced' architectural composition (based on an A.A. Student's drawing), in which the subsidiary elements to the right and left are different in shape, but form a general balance of 'weight' - - - - -	19
27.	An unsymmetrical composition (based on the work of a Student of Columbia University), in which there is a free arrangement of elements which combine to produce a centre of gravity which is practically in the middle of the picture - - - - -	20
28.	The Church and Convent of San Francesco, Assisi. A free and unsymmetrical composition - - - - -	21
29.	The Casa d'Oro, Venice. A very delicate and clever adjustment of 'weights' to produce a central focus and a	

ILLUSTRATIONS

FIGURES

PAGE

	balance in a composition really consisting of two elements, but in which the presence of a third is suggested, thus avoiding duality - - - - -	22
30.	A composition of geometrical shapes and simple forms, in which varying weights and tone values serve to form a balance between elements of widely different shape. In spite of lack of complete symmetry the centre of gravity remains in the middle of the picture - - - - -	23
31, 32.	Sketches based on designs by Helmle and Corbett for the 'Skyscraper of the Future,' showing how simple geometrical shapes (31) form the basis of the finished architectural conception (32) - - - - -	24
33.	Church of the Miracoli, Venice. Contrast of elementary form, the cube, cylinder, hemisphere, octagon - - - - -	27
34.	Contrast of line in the contour of form exemplified in a candelabrum - - - - -	27
35.	The Chiesa del Santo, Padua. Contrast in proportion between forms of the same type and general contrast of geometrical shapes - - - - -	27
36.	The Palazzo Communale, Siena. Magnificent contrast of horizontals and verticals - - - - -	28
37.	Geometrical pattern from the Cathedral of Monreale. Repetition relieved by contrast of form and tone - - - - -	28
38.	West Front of Wells Cathedral. A fine composition, conveying an effect of decision - - - - -	29
39.	A New York Office Building. Indecision through continual stressing of horizontals in a vertical mass - - - - -	30
40.	Farnese Palace, Rome. In spite of the fine feeling of this building, the solids and voids are hesitating and weak in their relationship - - - - -	30
41.	The Chapel, Trinity College, Dublin. Solids clearly dominating over voids - - - - -	31
42.	The Cloisters, Salisbury Cathedral. Voids dominating over solids, typical of the Gothic spirit - - - - -	32
43.	Lord Leicester's Hospital, Warwick. Contrast of materials, tone and colour, harmonised by judicious handling - - - - -	33
44.	Riccardi Palace, Florence. Note the contrast in the surface treatment of the masonry in ground and upper stories - - - - -	34
45.	The San Carlo Theatre, Naples. The contrast of character and scale between the two stories is so marked as almost to produce an effect of separation - - - - -	34
46.	Reconstruction of a room in a Swiss House, Zurich. The interest is here dispersed by excessive use of contrast, resulting in a lack of main contrast, e.g. between ceiling and walls. A solution might have been found in a simpler wall treatment - - - - -	35

FIGURES		PAGE
47.	Church in Stockholm. Contrast in shapes, both in the main mass and in the form of the tower. Dominant verticality -	39
48.	Loggia in the Piazza dei Signori, Verona. Pilasters as a useful element in design, providing the accents and rhythm, and breaking up solids so as to obviate competition with voids	41
49.	Prize design for Scottish Rite Competition, Portland, Oregon, by Sutton and Whitney. Study in the treatment of rectangular forms without the aid of classic detail - -	41
50.	The Einstein Tower, Potsdam, by Erich Mendelsohn. Expressionism in plastic form - - - - -	42
51.	Seamen's Union Building, the Helder, Holland, by P. Kramer. A dignified and well-massed handling of form with accompanying appropriate detail - - - - -	42
52.	Fountain in Borghese Gardens, Rome. Importance of line as contour of objects - - - - -	44
53.	Inn sign from Guarda (Engadine). Importance of silhouette -	44
54.	Residence in Berkeley, California, by Louis Mullgardt. Not free from tradition, but depending for effect on decision of idea and plastic treatment of form masses to suit the site. Note unity of house and landscape - - -	45
55.	Design for a National Theatre, Amsterdam, by Th. H. Wijdeveldt. Expressionism, study of pure form, breadth of treatment, consideration of site in determining shapes -	46
56.	Design for Boating Club, Amsterdam, by de Klerk. Expression of function, handling of form to harmonise with building's purpose and situation - - - - -	46
57.	German design by Walter Gropius and Adolf Meyer for <i>Chicago Tribune</i> Building. Study of massing of elementary form, relieved by accents definitely placed. The building is in reinforced concrete and glass - - -	47
58.	An Ionic entablature. Contrast in mouldings - - -	49
59.	The entrance to an American hotel. Here we have 'positive' columns taking the arch weight, columns bearing consoles which are practically 'negative,' and purely 'negative' decoration in the arch spandrels - - - - -	52
60.	The stern of <i>Le Roi Soleil</i> , a vessel of the time of Louis XIV. Exemplifies the softening of 'positive' rigidity by 'negative' accompaniments - - - - -	52
61.	Leonardo da Vinci's painting of 'The Last Supper.' Note contrast between rigid architectural background and free grouping of figures, and the method of accentuating the central figure of Christ by converging lines - - -	53
62.	A design by a student of the Dutch Reijks Academy for a People's Hall. Severity almost unrelieved, showing tendency to 'dehumanise' architecture - - - - -	54

ILLUSTRATIONS

xiii

FIGURES

PAGE

63.	The 'Grotto of the Pine,' Fontainebleau. Human figures semi-conventionalised and used as a decorative motive. Structure here does not depend on their presence as is the case with the Caryatid Porch of the Erectheion - -	56
64.	Window at the Wesleyan Hall, Westminster; Lanchester and Richards, architects. Sketch after the architects' drawing for sculpture over window to main front. 'Negative' masses tending to obscure 'positive' function - -	56
65.	The Church of Santa Maria Araceli, Rome. Accentuation of the doorway - - - - -	60
66.	The Dom Kirche, Mayence. Concentration by radiating pattern. The arrows show the direction of the general concentration on to the sculpture of the over-door lunette	61
67.	Central doorway of the Temple of Angkor Vat as reconstituted at the 1922 Colonial Exhibition at Marseilles. An effect of climax heightened by receding planes, and perspective accentuated by repetition of motives diminishing in size -	61
68.	Monument to the Dead in the French Seminary in Rome, by Roux-Spitz and Delamarre. The wings of the figures and the flow of the drapery are subtly used to focus the interest towards the central name tablet - - - -	63
69.	Tomb of Lorenzo di Medici, in the Sacristy of San Lorenzo, Florence. The dotted lines show how the composition is arranged to guide the eye towards the focus of the central figure - - - - -	63
70.	The British Museum Extension. Sir John Burnet, A.R.A. Repetition of motive producing, not monotony, but a strong emphasis of unity - - - - -	66
71.	Winning design by Howells and Hood, for the <i>Chicago Tribune</i> Building. Pronounced verticality eliminating necessity for wide and solid corner piers - - - - -	68
72.	Premiated design, by Thomas Worthington & Sons, for the East Lancashire Masonic Hall competition, Manchester. Dignity and repose through ample wall surfaces crowning the scheme of fenestration - - - - -	68
73.	The 'Five Sisters,' York Minster. Character of austerity and aspiration conveyed by great height and simplicity of expression - - - - -	69
74.	Station of the New Orleans Terminal Company, D. H. Burnham & Co., architects. The ample effect of one large simple motive on a comparatively restricted frontage -	70
75.	War Memorial Chapel for Charterhouse School, by Sir Gilbert Scott, R.A. A further example of verticality as an expression of character - - - - -	71
76.	The stack room of the New York Public Library, by Carrère and Hastings. Definite proportions in fenestration as an expression of function - - - - -	72

FIGURES		PAGE
77.	Messrs. Heal's shop in Tottenham Court Road, London. Effective handling of shadow through varying depths of reveals - - - - -	72
78.	Office buildings in New York. Heavy and ill-attached cornices, relic of the Italian Renaissance influence, but in this case superfluous and weak - - - - -	74
79.	House at Greenlawn, Long Island, U.S.A., by John Russell Pope. The high roof as an aid to expression of character	74
80.	A San Francisco shop-front, the façade of which is almost entirely in glass - - - - -	75
81.	The presence of the triangle in Greek proportions. Façade of the Temple of Poseidon at Pæstum (after Benoît) - -	79
82, 83.	Longitudinal and transverse sections of the same - - -	79
84, 85.	Geometrical proportions in Persian buildings. Gate of Honour of the Royal City of Persepolis, and façade of the Tomb of Darius (after Benoît) - - - - -	79
86.	The presence also in Byzantine proportions of the equilateral triangle. Santa Sophia in Constantinople (after Benoît) -	79
87.	Triangular setting-out in the Caryatid Porch of the Erechtheion (after Benoît) - - - - -	81
88.	The plan of Beauvais Cathedral and the relation of its proportions to the 'vesica piscis' - - - - -	81
89	Geometrical proportions in the Palazzo Bartoloni in Florence. Note the diminishing ratios of the stories - - -	81
90, 91.	Geometrical relationships in details. Window and arcade from Italian palaces - - - - -	81
92.	Misplaced triangulation resulting in the effect of creating a duality. The faceted palace in Moscow - - -	83
93.	The formation of the 'vesica piscis' - - - - -	83
94.	The equilateral triangle in modern work. Bertram Goodhue's Nebraska Capitol - - - - -	83
95.	Illustrating the use of squared paper in determining the general proportions of an elevation - - - - -	84
96.	Geometrical basis of the Arc de Triomphe, Paris. Stability by use of the square and circle - - - - -	84
97.	Illustrating the use of squared paper in determining the general proportions of a plan - - - - -	86
98.	Brunelleschi's Church of San Spirito in Florence. Analysis of geometrical proportions and presence of the square as a basis for setting-out - - - - -	86
99.	Chevening, Kent, by Inigo Jones (from Vitruv. <i>Brit.</i> II). Note how the row of square windows acts as a stop and climax to the scheme of fenestration - - - - -	87

ILLUSTRATIONS

FIGURES

PAGE

100.	Hall window to the 'Deanery Garden,' a house by Sir Edwin Lutyens. The window division is extremely pleasant, the two lower divisions being five panes in height, the upper divisions each four panes - - - - -	87
101.	Rayland Castle, Monmouthshire (after Pugin). Various types of window. Note the placing of transoms which in no case gives a square upper division - - - - -	88
102.	At Hampton Court Palace the circular and square upper windows duplicate each other's function from the point of view of composition, the effect produced by this 'dual' stop to the fenestration being too emphatic to be altogether successful - - - - -	88
103.	Various types of transom division in windows 'a,' 'b,' and 'c'	88
104.	An effect of overpowering scale is obtained in this French student's design for a 'Château Entrance' by utilizing elements, large in themselves, to build up an effect of scale through their subordination to elements still greater in size. The wings give scale to the arched doorway, the doorway to the columnar pylons, the pylons to the niche, and the niche to the pediment. The size of the human figure gives a realization of the vast scale of the whole -	89
105.	Base of design for 'Monument to the Glory of the American Nation,' by Despradelle. Another example of scale obtained by juxtaposition of elements with elements still larger. Note the size of human figures and columns at foot of steps. The columns themselves are large, but appear minute by comparison with other elements - -	89
106.	A clock dial on a modern building. An instance of the actual size or true scale being conveyed by the accident of the presence of the human figure - - - - -	90
107.	The new extension of the Selfridge Store; Graham, Anderson, Probst and White, and Sir John Burnet and Partners, architects. The scale of this building is too large for most London streets under present conditions, and is probably designed to harmonize with a future architecture on more ample lines - - - - -	92
108.	House in Grosvenor Street by Blow and Billerey. Finely handled in itself, the scale of the façade is almost too overpowering for the architecture of Grosvenor Street. Note the difference of scale with the adjoining premises -	93
109.	A doorway to a town house which the size of the human figure and of the adjoining windows reveals as being too small in scale and having too many elements for its actual physical dimensions - - - - -	93
110.	A cinema façade in which there is incompatibility between the scale of the two stories. The scale of the upper storey appears forced by the number and smallness of its elements, making this storey appear larger than it actually is - -	95

FIGURES

	PAGE
111. The introduction of innumerable ambitious elements in a restricted space results in falsity of scale and meanness of effect. This French villa appears to be a large building until the size of the human figure in the porch is observed. The elements are all too small to be treated in so pretentious a manner - - - - -	95
112. An Ecole des Beaux-Arts project by M. Tournon for a City Hotel. Note the balance of different groups and elements on each side of the longitudinal axis, as also the interest and variety of plan shapes, and the careful preparation of the central climax of the 'Winter Garden' - - -	101
113. Plan types—'A': The single unit. 'B' and 'C': Multiple units - - - - -	103
115. Plan of a house in Virginia (Goodwin, Bullard and Woolsey). A symmetrical exterior arrived at by balance of different elements in the two wings - - - - -	103
114. Ground plan of the Château of Versailles. Note the preparation of climax through the diminishing recessed entrance courts and the right wing with chapel and theatre, forming a balance to the left wing, in which the unit elements are different - - - - -	104
116. Plan of lay-out of Cubley Village, Penistone, by Sir Herbert Baker, showing small units repeating and used by their grouping to form centres of interest. Accent of various points is provided by communal buildings, churches, etc. -	104
117. Plan of the new London County Hall by Ralph Knott. The central Council Chamber is the focus of the scheme. Note the approaches to the climax and also the treatment of the façades in which the requirements did not suggest much plan modelling - - - - -	107
118. Plan of the new Town Hall, Stockholm, by Ragnar Östberg. The site demanded an asymmetrical scheme, and the plan generally is treated in a mediæval rather than a Roman spirit - - - - -	107
119. Sculpture galleries at the Vatican, including the octagonal open court of the 'Belvedere.' Interesting plan shapes justified by the special purpose of the rooms and galleries laid out for the display of choice works of sculpture - - -	108
120. A modern school plan, by Edward T. Allcock, with the Assembly Hall as focal point. The classrooms and cloak-rooms are treated as sub-divisions of a block or unit, and not as individual isolated elements - - - - -	109
121. Plan of the front portion of the Palais de l'Institut, Paris. An example of magnificence and dramatic effect gained by a recession of the domed central pavilion, linked to the end pavilions by curved walls lower in height. The central pavilion is in the nature of a prepared climax - - -	109

ILLUSTRATIONS

xvii

FIGURES

PAGE

- | | | |
|------|--|-----|
| 122. | Diagram plan of the Port of London Authority Building by Sir Edwin Cooper. The Rates Office is the focus of the scheme. Note the preparatory vestibules, the plan shapes giving points of interest, and the proportions of rooms to circulations - - - - - | 110 |
| 123. | Imperial Hotel, Tokyo, by Frank Lloyd Wright. The plan lay-out reveals the simple rectangular modern construction in reinforced concrete with main points of support and thinner curtain walls. Note the difference in weights of walls, expressive of the varying spans and character of the plan divisions - - - - - | 112 |
| 124. | The Temple at Selinonte as restored by Hulot. Note the plan mosaic which is here not a conventional indication, but represents the actual flooring. The design of the mosaic is very well related to its position in the various parts of the plan, the more brilliant patterns being reserved for the points which it is desired to emphasize - - - - - | 112 |
| 125. | Theatre of the Champs Elysées, Paris, by A. and G. Perret. A glance at the plan reveals the light modern construction evidenced by thin walls and widely spaced points of support. The plan shapes follow the type of construction, and are but little imitative of solid masonry - - - - - | 115 |
| 126. | The so-called Cour Ovale at Fontainebleau. Note the old-type expression of plan weights resulting from solid masonry construction with enormous reveals and wall thicknesses required by the thrust of vaults, superposition of towers, etc. - - - - - | 115 |
| 127. | A second Grand Prix design for 'the Residence in Morocco of the French Representative,' by M. Leconte. Note the generally symmetrical lay-out relieved by the diversity of mass and treatment in the two wings which lessens the note of formality - - - - - | 116 |
| 128. | St. Peter's at Rome. A plan reminiscent of the heavy construction of Roman work, with plan shapes hollowed out of the solid. The 'weights' of the supports reveal the location of the dome and its abutments, greater than those required by the simpler problem of the construction of the nave. Contrast with Plans 123 and 125 - - - - - | 116 |
| 129. | House at Cumnor, Oxford, by de Soissons and Wornum. An example of ingenuity in the balance of different elements, and a semi-monumental type of lay-out applied to a small scale residence - - - - - | 118 |
| 130. | Stoke Park, Northamptonshire (from Vitruv. <i>Brit.</i> III). Said to have been brought from Italy, this design ambitions a fully monumental type, with subsidiary and focal climaxes and formal axial planning. The mass of the central block is weak compared with the wings - - - - - | 118 |

FIGURES		PAGE
131.	House at Ilkley, Yorks, by Sir Edwin Lutyens. Built in the grand manner on a small scale, this plan shows both formality and playfulness. It is a luxurious type, and not typical of modern economy, either in planning or construction, but is interesting as a successful study in a definite manner - - - - -	120
132.	Little Garth, Syresham, by Biddulph Pinchard. The typical English informal and 'romantic' plan type. Axial lines avoided, and picturesqueness and intimacy aimed at rather than stateliness - - - - -	120
133.	A French villa of concrete construction by Le Corbusier Saugnier. A very interesting and ultra-modern type, the domestic dwelling handled like an hotel on a small scale. Marked axiality and suave treatment of shapes - -	122
134.	Paris flats, by M. Thion. Typical French planning, axiality, carefully studied and balanced shapes, and an ingenuity of treatment in the avoidance of awkward forms which English economy would only rarely permit in a similar case	122
135.	House at Hampstead, by C. H. James (Hennell and James). The present-day tendency in English small house design. Great economy of space ingeniously managed by creating balance to obtain a formal exterior. Tendency towards axiality - - - - -	125
136.	Eastover, Connecticut, U.S.A., by Charles Platt. Typical of the American formal manner. Well-studied balance and proportions, and general axiality - - - - -	125
137, 138.	Elevation and plan of winning design for the Tennessee Memorial by McKim, Mead and White. Note the variations in the plans of the two wings, and the frank expression of these in the elevation. The balance of the composition is preserved by the maintenance of the running Order in each, while at the same time the fenestration gives truthful expression to the internal requirements of the planning - - - - -	128
139.	The New York State Education Building, Albany, by Palmer and Hornbostel. Here the façade takes the form of a screen behind which occurs the fenestration required for the various divisions of the plan. Expression of individual apartments is subordinated to the dominating idea of a highly monumental effect - - - - -	129
140.	Design for an Art Gallery by Easton and Robertson. Normal fenestration is here not desired, and the elevation expresses the requirements of the art gallery plan type - - -	129
141.	The University Club, Chicago, by Holabird and Roche. Note the expression in elevation of the large and lofty dining-hall on the eighth floor. The collegiate Gothic treatment and the handling of the fenestration marks the expression as other than that of the usual office building - - -	130

ILLUSTRATIONS

FIGURES		PAGE
142.	The Banqueting House, Whitehall, by Inigo Jones. The reproach is often made that the hall is screened behind an elevation which expresses a two-storied interior. The presence of the gallery largely justifies, however, the scheme of fenestration adopted - - - - -	132
143.	A furniture storage warehouse in Chicago, by Ottenheimer, Stern and Reichert. Expression of planning and function is here obvious and direct, and the absence of normal fenestration has been frankly accepted, interest being legitimately obtained by surface treatment - - - - -	132
144.	The Pennsylvania Railroad Station, New York, by McKim, Mead and White. Note the expression in the elevation of the main waiting hall, rising above the roofs of the subsidiary plan elements. The desire for monumental effect makes this treatment practicable, and it is logically expressed -	134
145, 146.	Elevation and plan of Greenwich Savings Bank Building in New York, by York and Sawyer. In this case the exterior does not express the elliptical banking hall, which dominates the plan. Such expression as might have been obtained was probably not considered to be worth the sacrifices in other ways involved, but the building would undoubtedly have gained in elevational interest if the unusual internal shaping could have been used as the keynote to the exterior design - . - - - -	134
147, 148.	Plan and elevation of the Church of the Madeleine, Paris. This is an instance often cited of false expression of plan in elevation. The three main domed compartments of the interior and the apsidal end suggest a façade of far greater interest than that revealed by the conventional Neo-Roman temple treatment - - - - -	135
149, 150.	Side elevation and ground plan of the Paris Opera House, by Charles Garnier. This is one of the most beautifully studied plans of any comparatively modern building, and its various elements are clearly articulated and marked in the elevations, so that the main planning divisions can readily be perceived without entering the building - -	136
151.	The main block of the Virchow Hospital, Berlin, by Ludwig Hoffmann. An honest and interesting attempt to express a main staircase in elevation. It is, however, open to question whether the resulting elevational disturbance is justified by the importance of the element expressed, which is not in this case dominating the building's conception, and is not perhaps sufficiently interesting to call for such strong emphasis - - - - -	138
152.	A typical American Bank Building, the First National Bank, Hoboken, by Kenneth Murchison. This type is dignified and well handled, but contributes little to the progress of architectural design - - - - -	141

FIGURES		PAGE
153.	The People's Savings Bank of Cedar Rapids, Iowa, by Louis H. Sullivan. This building breaks away from tradition, and is a straightforward solution of the particular conditions affecting the design. It is by no means completely satisfactory, but is vital and interesting - - - -	141
154, 155.	Two modern shops in stylistic character. Tudor House, Argyll Place, London, by Edwin T. and E. Stanley Hall, and Whiteley's Stores, London, by Belcher and Joass. The former building has adopted a sixteenth-century expression, considered the most appropriate for the business of the clients. The latter is a large general departmental store. Both buildings are built of modern fireproof construction, and both have a surface treatment applied to the structure, and in this are equally conventional. The convention merely differs according to the expression of character desired - - - -	142
156.	A reinforced concrete grain elevator at Montreal. This structure shows the immense possibilities of interesting handling of simple materials and forms. The design is absolutely functional, but skill and knowledge are evidenced in the handling of the resulting masses - - - -	143
157.	The Union Station at Washington, by D. H. Burnham & Co., architects. A modern building treated in the antique manner	144
158.	The Great Northern Station at Minneapolis, by Charles Frost. This building is an excellent essay in classic design, and has, like the Union Station, a fine civic character. But it might serve almost equally well as a design for a post office in the 'official' style of the larger American cities - -	144
159.	Helsingfors Railway Station, by Eliel Saarinen. A praiseworthy attempt at an expression, both functional and national. This big building has the civic quality combined with vitality in design - - - -	144
160.	Building for the offices of the <i>Berliner Tageblatt</i> , by Erich Mendelsohn. An essay in the most modern German manner, designed to express the function and construction of an important office building, but suffering from overemphasis and coarseness of handling - - - -	145
161.	Wireless Station, Kootwyk, Holland, by J. M. Luthman. An expressive and interesting concrete structure, designed in sympathy with its material - - - -	146
162.	The Centre Court Lawn Tennis Stand at Wimbledon, by Stanley Peach. An honest and expressive concrete treatment, showing the architectural possibilities of the most utilitarian structures - - - -	146
163.	The Botanical Building, San Diego Exposition (Bertram Goodhue, advisory and consulting architect). This building shows straightforward expression of function, satisfactory because of good massing and frankness of treatment	146

THE PRINCIPLES OF ARCHITECTURAL COMPOSITION

I

The Consideration of Unity

IN considering the theory of architecture we distinguish two separate, though not entirely independent, points of view: that which regards the question of design in the abstract and considers the æsthetic effect of a building without special regard to its function and structure; and that which deals with the practical requirements of purpose, the elements which go to form the complete building, the methods of construction utilized, all matters which are related to what we may call, for the sake of brevity, functional design.

An understanding of functional design, the study of the building and its various parts, cannot, however, be satisfactorily translated into an architectural creation unless it is accomplished through a comprehension of the laws of composition, through knowledge of the grammar of design. The natural and often unerring instinct of the born artist may serve in lieu of a conscious effort towards creation, but even the most gifted designer will benefit by applying to his work the test of an examination of his design syntax. It is our purpose to attempt to formulate, however incompletely, an elementary theory upon which the designer

may graft the results of his own observation and experience—a theory which aims at resuming certain principles of which an analysis of good architecture has proved the existence, but which must not be misconstrued into an attempt to offer a rule-of-thumb recipe for producing ready-made beauty in architecture.

A criticism which may be levelled at many notable works of architectural analysis and appreciation arises from the obtrusion of the artistic preferences and prejudices of the author. Ruskin is a notorious offender in this respect, and is largely discredited to-day for the logical reason that he failed to acknowledge that good architecture is entirely independent of so-called 'styles.' Any 'battle of the styles' is ridiculous in principle, as good or bad architecture may be found under the externals of any style or manner, according to the degree in which the principles of good composition have been adhered to, and worked out by understanding minds and hands. To praise one style as good, and condemn another as bad, is to adopt the attitude of a European who lays it down that all English women are beautiful and all Orientals are ugly. It should be one of the analyst's functions to try to satisfy himself as to whether a building is a success or a failure as a piece of composition, and for that he must look above all for the application of sound first principles. He may indicate his personal preferences, but praise or condemnation based on these alone will be valueless, for taste changes as the world progresses, and the rejected of to-day may be the accepted of to-morrow.

The problem of the architect of the twentieth century, as far as abstract composition is concerned, is basically the same as that which has confronted the designer throughout

all the ages, for the principles of composition remain unchanged even though standards of appreciation have altered.

It is the nature of the creation to which these principles will be applied, and the manner of their expression, which are being constantly and infinitely varied. It is safe to say that as regards the former the modern architect has a more difficult and complex problem than his ancestors, while as regards expression there is the compensation of a sufficiency of undertakings which touch the imagination by their magnitude and the unrivalled technical resources available for their achievement; problems demanding greater flexibility and wider knowledge than of old, in which a multitude of practical and conflicting factors divert attention from the effort toward purely artistic creation. The examination of the practical factors which influence the design of buildings in a direct and concrete sense forms a study quasi-independent of the consideration of design in the abstract, and with these factors we do not propose to deal. Practical limitations, special requirements, conditions of all sorts, produce in the design of buildings certain characteristics which may well dominate the whole conception. This phenomenon will not, however, release the designer from his task of attempting to handle the resultant forms of his building in such a way as to express his vision or conception of what such a building should be. The processes of his mind should be so trained as to enable him to form his conception, and his knowledge of the grammar and technique of abstract composition should enable his conception to be cast in such harmonious form that its realization will satisfy certain æsthetic requirements which a consensus of enlightened opinion demands of what is termed a work of art.

Perfection of grammar, a technique however perfect, is not, however, sufficient by itself, and is only a means to an end. It constitutes merely the medium of expression of the fundamental idea. The test of good architecture is the interest, the importance, the quality of the idea which the architect is attempting to express in his building, and judgment on a building is judgment on the human personal ideal of which that building is the expression.

The essentials of good architecture are considered, therefore, as including an almost abstract quality which may be perceptible to different people and in various degrees, and they are consequently extremely difficult to tabulate. Definitions have been frequently attempted; but even the most satisfactory leave something to be explained. The oft-quoted Sir Henry Wotton, who finds in good building the qualities of 'commodity, firmness, and delight,' sums up the essentials with a brevity which is full of savour. In this case it is certainly the inwardness of 'delight' which makes the greatest demands on the explanatory powers of the analyst, and it is safe to conclude that recognition of its presence is largely a matter of the personal equation, that it depends, in fact, on the existence of a link of sympathy between the mind of the beholder and the idea of the designer who imbued his building with an attribute derived from his own personality. The reactions which a building will produce on certain trained minds will, therefore, differ in the ratio of the infinite variations of their possessors' own feelings and intuitions; but at the same time, these minds, being schooled to appreciate perfection in the grammar of design, will agree in finding in the building certain definite analysable qualities or defects independent of an abstract character or expression of personality.

It is to the examination of these analysable qualities that we wish to proceed. Architecture, we have argued, is the expression in concrete form of an idea. The same may be said of painting, sculpture, music, or literature, in fact, of any art which is original and not imitative. Any idea or conception, before it can be satisfactorily translated into any medium, must *a priori* be complete, and cannot be composed of scattered elements which are unrelated to each other and represent diffusion as opposed to unity. The conception being necessarily a unified whole, it follows that its concrete realization in architecture must express complete unity. It is the presence of the quality of unity in architecture which marks the difference between an architectural composition and a haphazard arrangement of scattered architectural elements, which, if they may be dignified by the title of 'conception,' must be considered as representing a weak and incomplete idea of a necessarily low order.

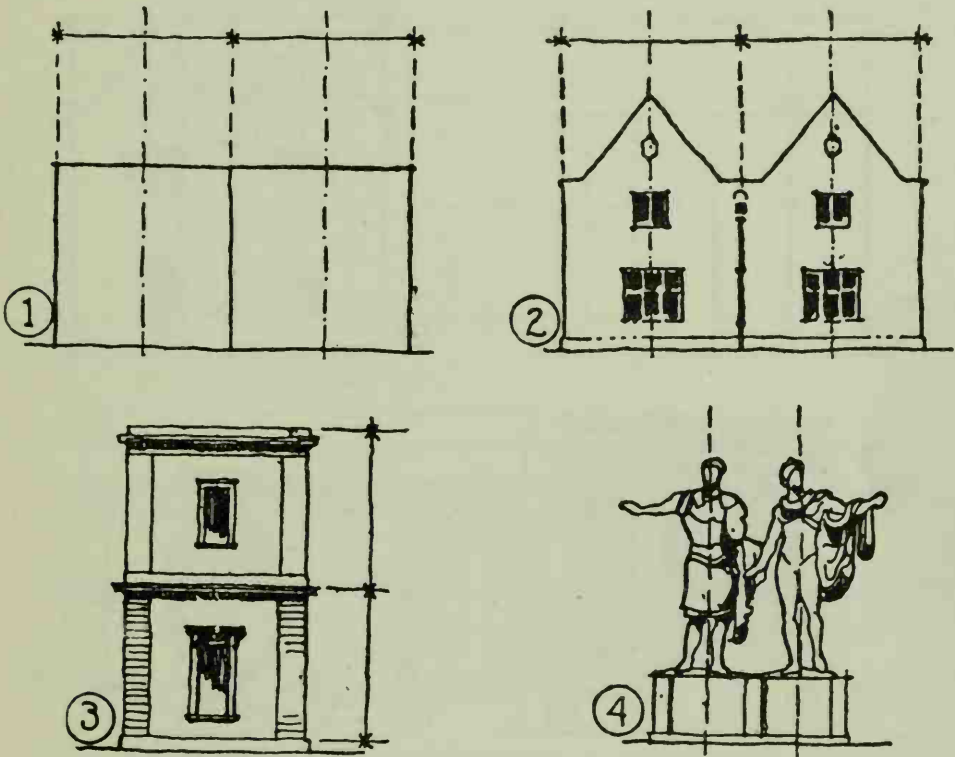
The consideration of unity leads to an examination of the requirements of design necessary for its maintenance, and to the study of the manner in which a composition may be arranged in such a way that the designer will not be restricted to the use of merely a single unit or element, and may proportion a group of elements in a manner ensuring that coherence in the expression of his idea will not be sacrificed. In order that unity in composition should be maintained, it is necessary that some central or focal idea in the composition should be clearly apparent and should dominate the conception. We will call it, for convenience, the dominant. The dominant may consist of one single unit or element, or it may consist of a plurality of elements of varying sizes which form a dominating

group. It is the relation of these elements to each other, and to the composition as a whole, which we call *proportion*, and it is a correct scheme of proportion in mass and detail which determines the unity or otherwise of a composition.

The rules of proportion are not capable of mathematical formulation by any method yet devised, and their appreciation and understanding are the cherished prerogative of the trained artist. The conditions of every problem in art are infinitely varied, and no formula can cover these variations which are themselves subject to the variations of the human mind and personality. It is possible, however, to indicate certain proportions which result in producing certain definite effects, and the employment of which have a direct bearing on the task of composition.

Let us suppose in considering a certain element or unit of form, that we create in it a line of division which will divide it into two parts, thus suggesting the creation of two elements. These elements may be equal or unequal, and, as we have already stated, their ratio of size the one to the other, and to the unit as a whole, constitutes their *proportion*. If the division is into two equal parts, we have equality of proportion, and a tendency for our unit to be split in twain, thus weakening the impression of the original unity. The effect will be more marked according to the original proportions of the unit. If, for example, we have assumed a rectangle, the long side of which is twice the length of the short side, the division into two parts gives a resultant figure of two squares in juxtaposition (Fig. 1). The eye, accustomed readily to grasp simple shapes, immediately detects the presence of the two squares, each of which tends to become a definite unit, with the result that the unity of the original rectangle has disappeared, and has become a

duality, both members of the duality being of equal value, and, therefore, competing with each other as objects of interest. We have, in fact, arrived at a proportion of subdivision which has succeeded in destroying unity, and which has split up the original conception into two parts, eliminating the 'dominant,' and vitally weakening the

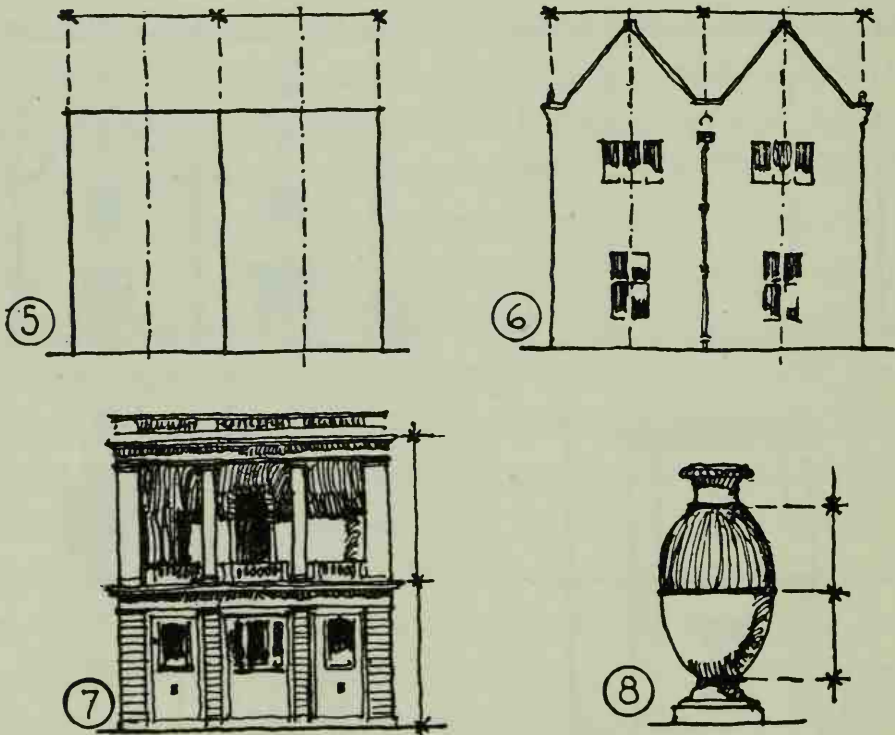


FIGS. 1, 2, 3, and 4 illustrate the destruction of Unity by competing Dualities.

composition (Figs. 2, 3, and 4). If, however, the original rectangle had been of such proportions that the subdivision resulted in two figures of less definite shape, less easily grasped by the eye as units, the effect of weakness would still have been present, but to a smaller degree (Figs. 5 and 6).

It is not necessary that the object which we are considering should be of symmetrical shape for the effect of its

subdivision to be noticeable, the same effect of competition and weakening of unity being apparent, for example, in the case of a vase which has a fillet placed round its centre (Fig. 8). In such an instance, however, the difference of form, in the masses which result from the subdivision, lessens the effect of duality, and prevents the eye from

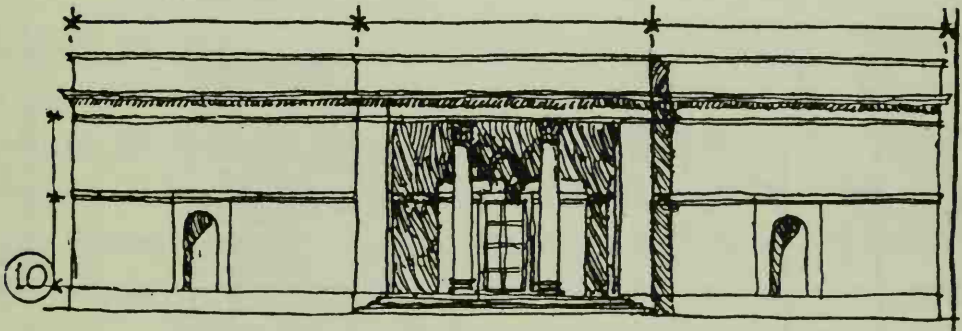
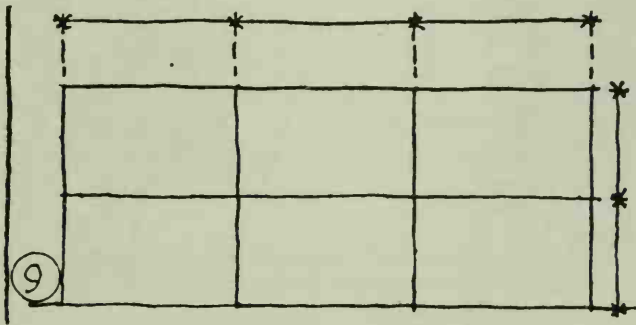


FIGS. 5 and 6.—Effect of Duality lessened where shapes are less strongly marked.
 FIGS. 7 and 8.—Duality lessened by differences of tone and texture.

grasping it so readily. A similar effect of attenuating the appearance of equality may be attained by applying to one of the competing masses a difference of treatment or surface texture, which will affect its apparent 'weight' as a mass (Figs. 7 and 12).

It has been sometimes held (cf. Trystan Edwards, *The Things Which are Seen*) that any object having a propor-

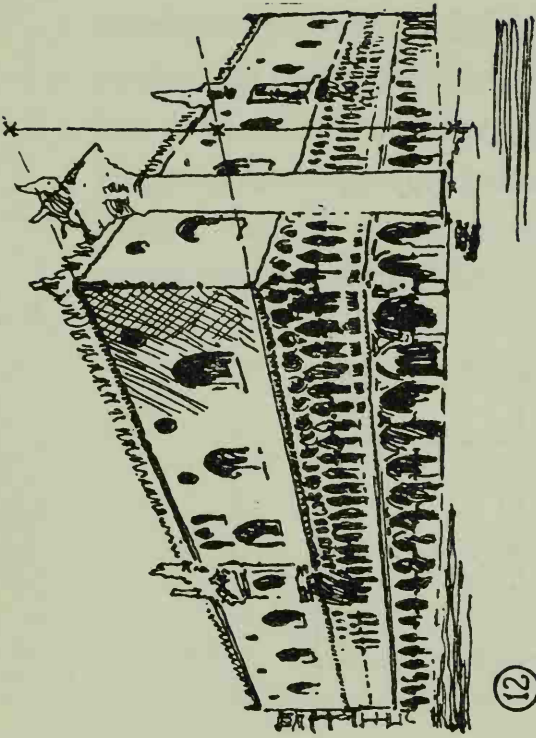
tion which admits of a ready subdivision into two definite units, such as the rectangle composed of a double square, is in itself inherently weak, it being suggested that the eye will automatically form such a subdivision, conveying a mental suggestion of duality. An instance of this would be the well-known example of the rectangular door open-



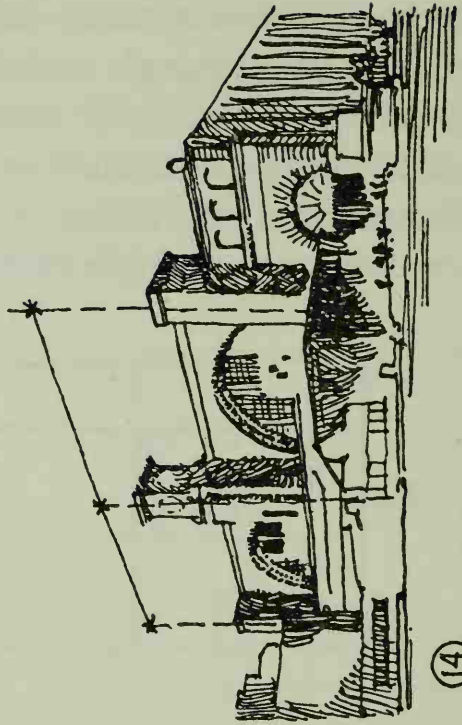
FIGS. 9 and 10.—Competition and destruction of Unity through equalities in a plural composition.

ing having a proportion in height to breadth of 2 to 1. (It is further claimed by some writers that, in addition, the shape is uninteresting æsthetically on account of the monotony which the easily detected ratio of proportion conveys.)

Such conclusions, however, take little account of other factors, which have an influence on the actual proportional ratio. An architectural element, such as a door, a window,

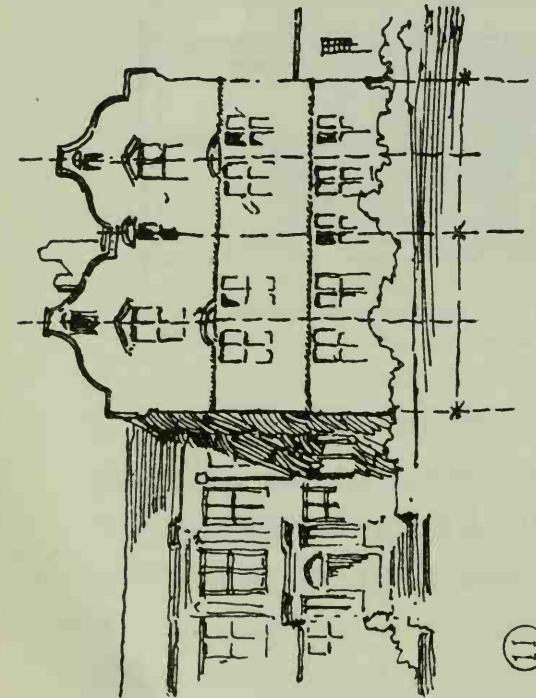


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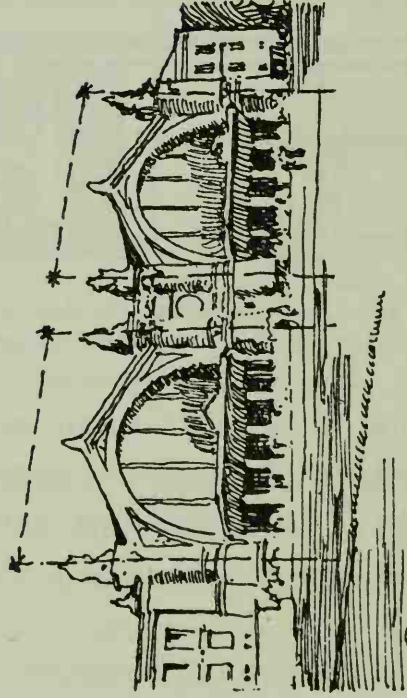


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FIG. 13.—The Station, Tours. A marked Duality.
FIG. 14.—King's Cross Station, London. A more successful attempt to overcome Duality.



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FIG. 11.—Tendency towards Duality in the Treasurer's House, York.
FIG. 12.—The Doge's Palace, Venice. Competition between ground and first stories lessened by contrast of treatment.

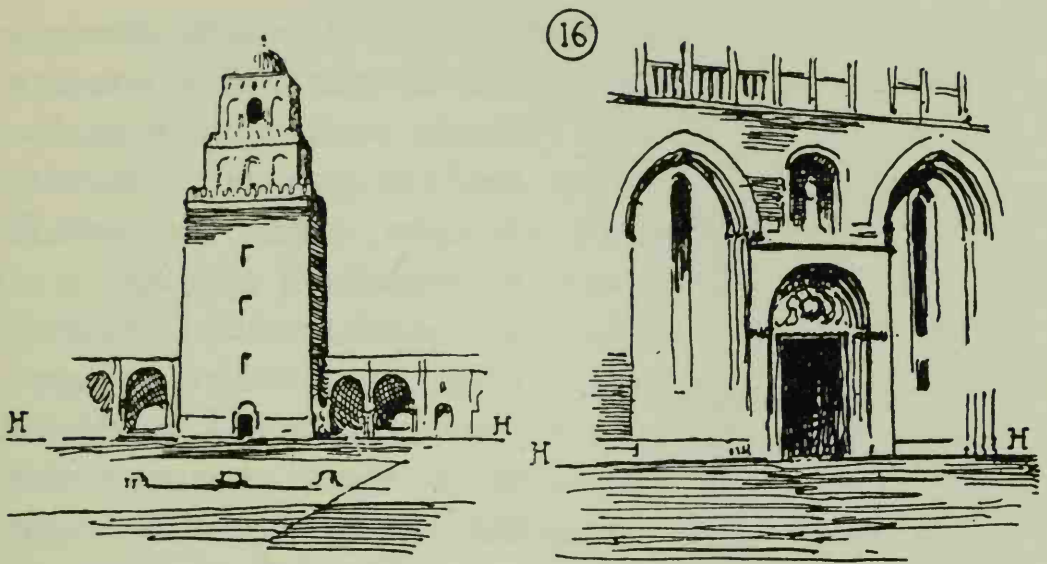


FIG. 15.—Minaret of the Grand Mosque, Kairouan. The apparent proportions of door opening affected by surrounding crushing mass.

FIG. 16.—Basilica di S. Antonio, Padua. The verticality of the doorway accentuated by accompanying verticals.

the wall or ceiling of a room, has a distinct sense of direction or position, one might also say of movement, in regard to the eye of the spectator. The appearance of the doorway is affected by the fact that its threshold is on the ground, or upon a step, that its sides or jambs are contained by abutting wall surfaces, at right angles to the plane of the ground, and that the space of wall above the lintel may differ in weight, mass, or texture, from those containing the two jambs. This setting must be considered in viewing the doorway itself, and assists in stressing or diminishing the effect of verticality or horizontality which the proportions of the opening may produce *per se*. A large mass of masonry above the door may produce a crushing effect, tending to diminish by weight the vertical proportions (Fig. 15). In Fig. 16 the narrow vertical jambs and the arched head accompany the effect of verticality in the door and accentuate it. Again, the presence of the ground line tends to

stabilize the composition on the line $H H$, and the eye does not instinctively seek the median division whose presence

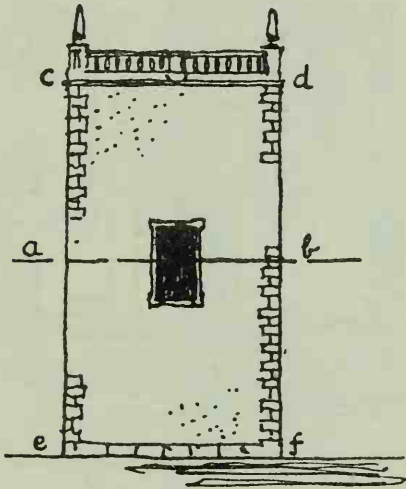


FIG. 17.—Tendency towards Duality in proportion of window increased by conditions of its setting.

would create duality in the doorway as a unit. Should, however, the composition represent an opening in a wall space bounded by $c d e f$ (Fig. 17), the obvious symmetry round $a b$ would be much more apparent, and the danger of duality might arise. It seems open to question whether the eye does actually create mental impressions of divisions which

are unfortunate, though it may suggest them if the general design lends itself to a decomposition into dualities. It is argued, for instance, that the proportions of the well-known 'double cube' room are bad for this reason, and yet these proportions are recognized to have produced effects very generally accepted as satisfactory in practice. (The reason for this we will discuss in a later chapter.)

Effects of duality and competition produced by equality of masses, such as those of walls, floors, and ceiling surfaces, are mitigated by the position of the spectator, whose eye can never be in a position to see them all at the same time and at the same angle. Wall, floor, and ceiling have also a different position in space, and the architectural 'tying in' of walls to ceiling will make these 'read together' instead of competing as would two equal surfaces on the same plane, one on each side of a horizontal or vertical axis. That repetition of actual physical dimensions very often

does produce an unsatisfactory effect has been proved by experience, but the conditions where such repetition occurs vary infinitely, and the result may be different in each case. The street of Kingsway has been cited (cf. Trystan Edwards, 'What is the matter with the Kingsway?' *Architecture*, March 1923) as producing an unhappy effect on account of the height of its buildings approximating to the width of the street, producing equality in proportion and destroying the dominant in this composition of street and buildings. But here the case is scarcely the same as that of an internal room having equality of dimensions between walls and ceiling. The ceiling of the room ties the walls together, thus stressing the impression that the room is a unity. The sky above London leaves the two groups of buildings on either side of Kingsway isolated merely as two vertical masses, of almost unlimited length, standing on a horizontal plane, unattached to each other, and severally competing in height with the width of the thoroughfare.

The presence of duality, the splitting up and weakening of unity, is one of the most common defects in architectural composition. It is a rule of the grammar of composition that absolute duality should be avoided,¹ and that no composition should consist only of two equal and detached elements which compete with each other and which form in reality two individual and similar compositions set side by side, each with its own axis of symmetry or centre of interest. A composition such as that produced by the two equal buildings in Fig. 18 has balance, but also dual

¹ We are enunciating this rule in a broad sense, for it is of course not without its exceptions. A duality may be intentionally introduced on account of its very weakness, to split up, for example, some element in the composition which might otherwise be overpowering. An example approximating to such a case is that of the Treasurer's House at York (Fig. 11). If the projecting wing had been treated as a perfect unit it might have been too dominant. Here is a case where too great strength might have upset the balance of the composition.

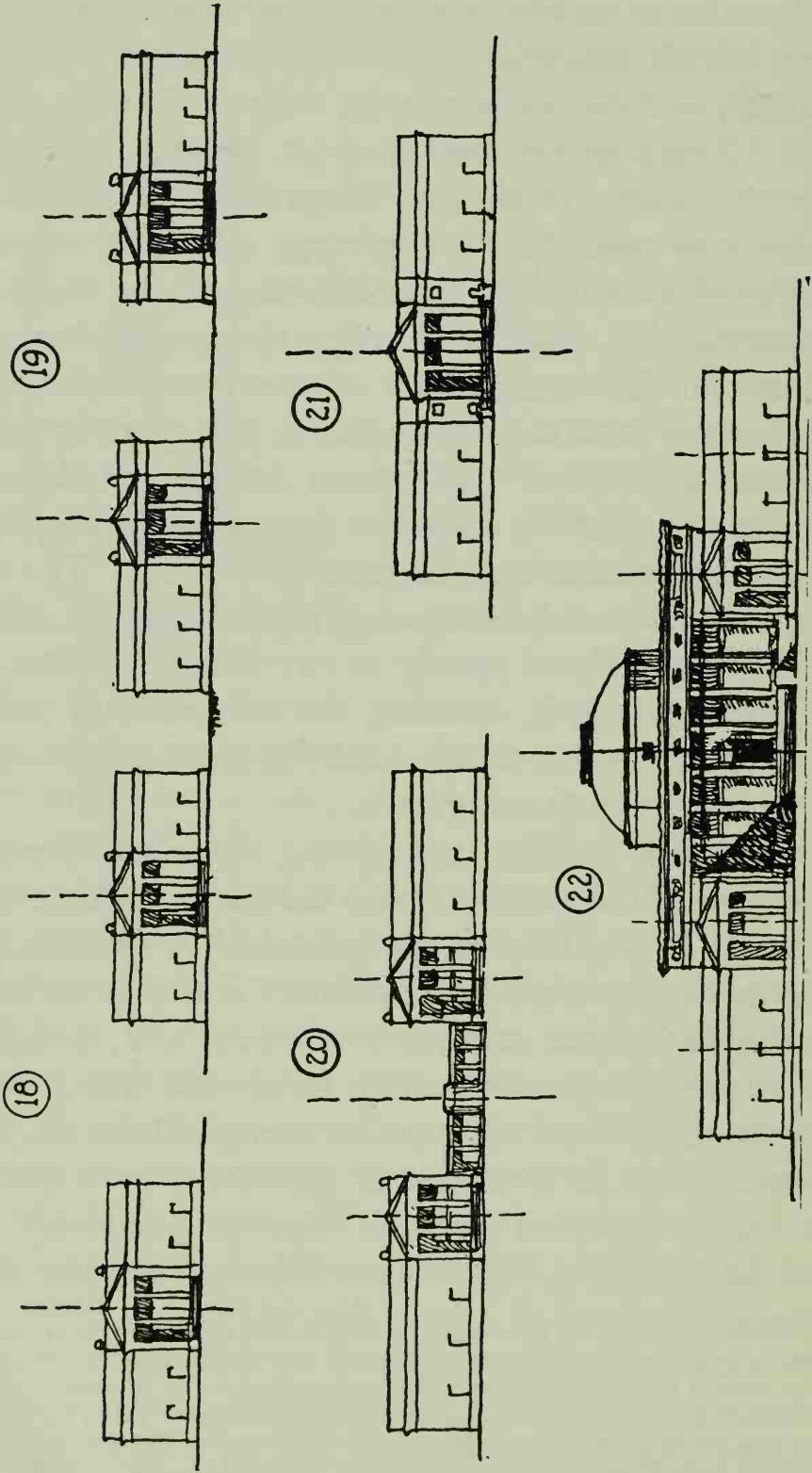


FIG. 18.—Duality.

FIG. 19.—Duality lessened by focussing interest towards centre.

FIG. 20.—Unity lessened by a 'link' element.

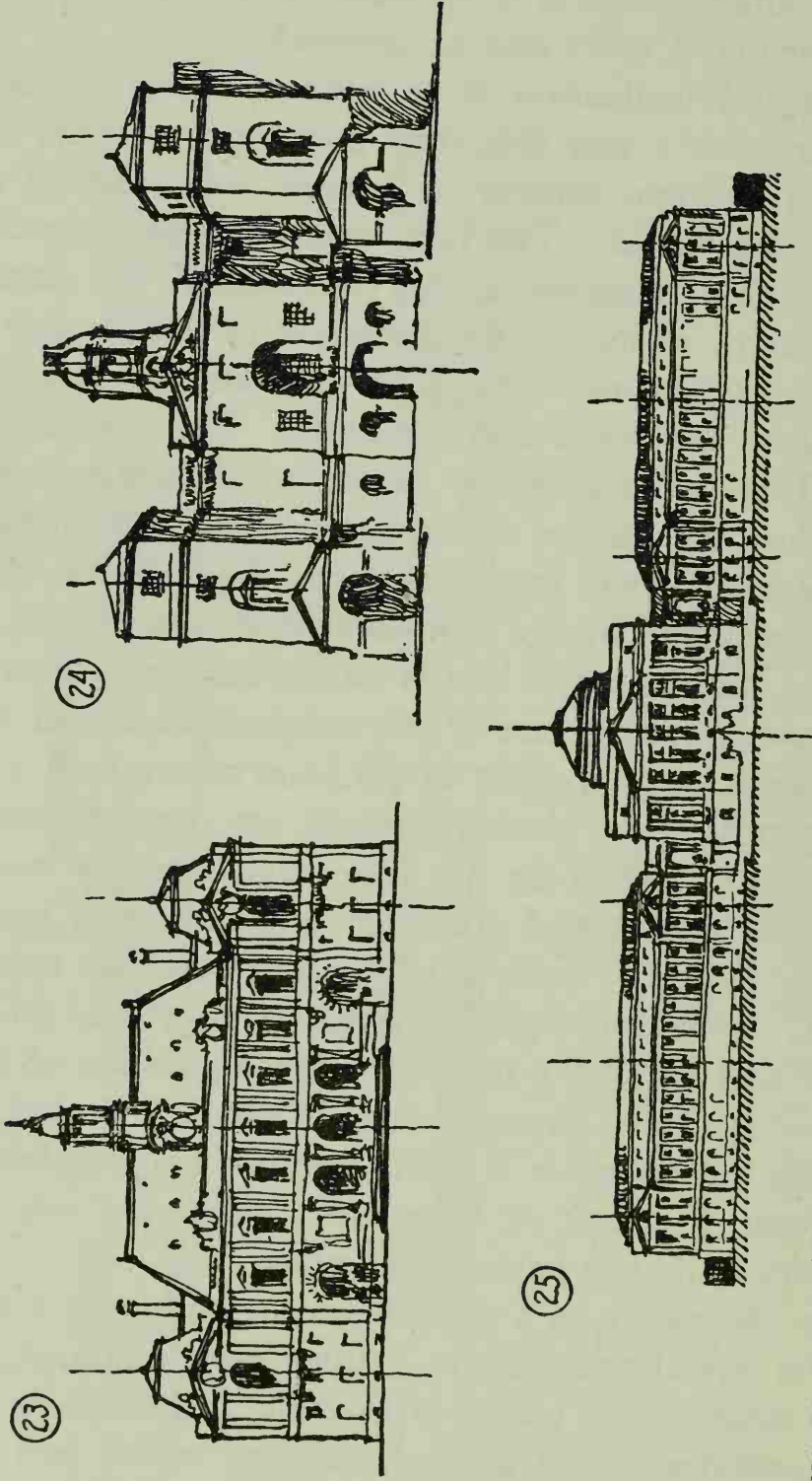
FIG. 21.—Complete Unity.

FIG. 22.—The two original elements unified by the introduction of a Dominant third element.

centres of interest, and it is necessary to examine by what means a feeling of unity may be restored.

The natural inclination is to bind the two buildings together in such a way that they may form a unity, thus eliminating the two centres of interest and creating one centre for the whole. The link which we may introduce becomes a third element in the composition, an element which actually exists, or the presence of which may be implied by suggestion, though in this case the feeling of unity will be less frank and complete. The obtaining of unity will be assisted by any device which tends to shift the existing dual centres of interest in directions bringing them closer together, that is towards the position which would be occupied by the link element if such existed. A shifting of the two centre motifs on the buildings shown in Fig. 18 towards the centre of the composition would assist in this object, and the effect would be as shown in Fig. 19, viz., to produce two elements which are *complementary* to each other and which do not have such strongly marked and independent axes of symmetry and centres of interest as those in Fig. 18. Such an effect in composition exists in Wren's Greenwich Hospital as it stands at present (cf. *The Things Which are Seen*), but while the suggestion of unity is improved, it is not so complete as would be the case were it possible to introduce a third element to complete the composition (Fig. 20), or better still, merge the two complementary buildings one into the other (Fig. 21).

As an alternative to a composition resulting in a single unit, it is equally possible to assume two buildings, each with its independent centre of interest, and to unify them by the introduction of a third building which will completely *dominate* them, having the necessary mass and



FIGS. 23, 24, 25.—The use of the Dominant to provide Unity in compositions of Plural elements. (The Hotel de Ville, Tours; Horse Guards, Whitehall, London; Design for U.S. Department of Agriculture, Washington, U.S.A.)

importance to create a unique and much stronger centre, to which the original centres become subservient (Figs. 22 and 25). We have in this case a composition formed of a plurality of elements in which there are three centres of interest, but the central element of which forms the *dominant* necessary to produce unity. The exact relationship of the elements in such a composition becomes a matter of proportion, and cannot be determined other than by cultivation of the æsthetic sense, though we have the general guidance of the rule that the proportions must be such that there will be no competition or hesitation resulting from equalities, and that the dominant must frankly dominate. *In effect, it is a golden rule in proportion that there must be no hesitation or weakness.* A happy proportion will be such that it appears inevitable and unalterable, and it is therefore indispensable that proportions be unhesitatingly determined.

II

The Composition of Masses

IT appears to be a fact that the human eye is pleased by definite forms, because such forms can be readily grasped and understood, and through this property produce an impression of general satisfaction. Regular figures, such as the square, the circle, the equilateral triangle, are all shapes which have the property of frank definition. They are devoid of any suggestion of tentativeness or hesitation in their proportions, and for this reason have stability. It is the presence of this quality of stability which probably explains the success of such recognized proportions as that of the double cube room previously referred to, and the doorway with its opening of a double square. The presence of proportions based on a figure having such a stable nature as the square satisfies our desire for strength, security, and settled repose, though it should be made quite clear that other requirements of composition may render the use of such definite shapes undesirable. This question will be treated in a chapter devoted to a more detailed discussion of proportion.

It should be clearly understood that there are no limitations to the number of elements which may go to form a composition, provided that their grouping be so arranged as to furnish a dominant or focal point of interest, which point should be the one to which the eye is first attracted and to which it naturally returns after an examination of the various subordinate details of the composition.

This centre of interest or focal point may be an actual solid element, or, more subtly, it may consist of a certain line, area, or point which constitutes what we will call the centre of gravity of the composition. This centre of gravity may actually be a blank space in the composition, on which the eye rests, while at the same time it perceives within the angle

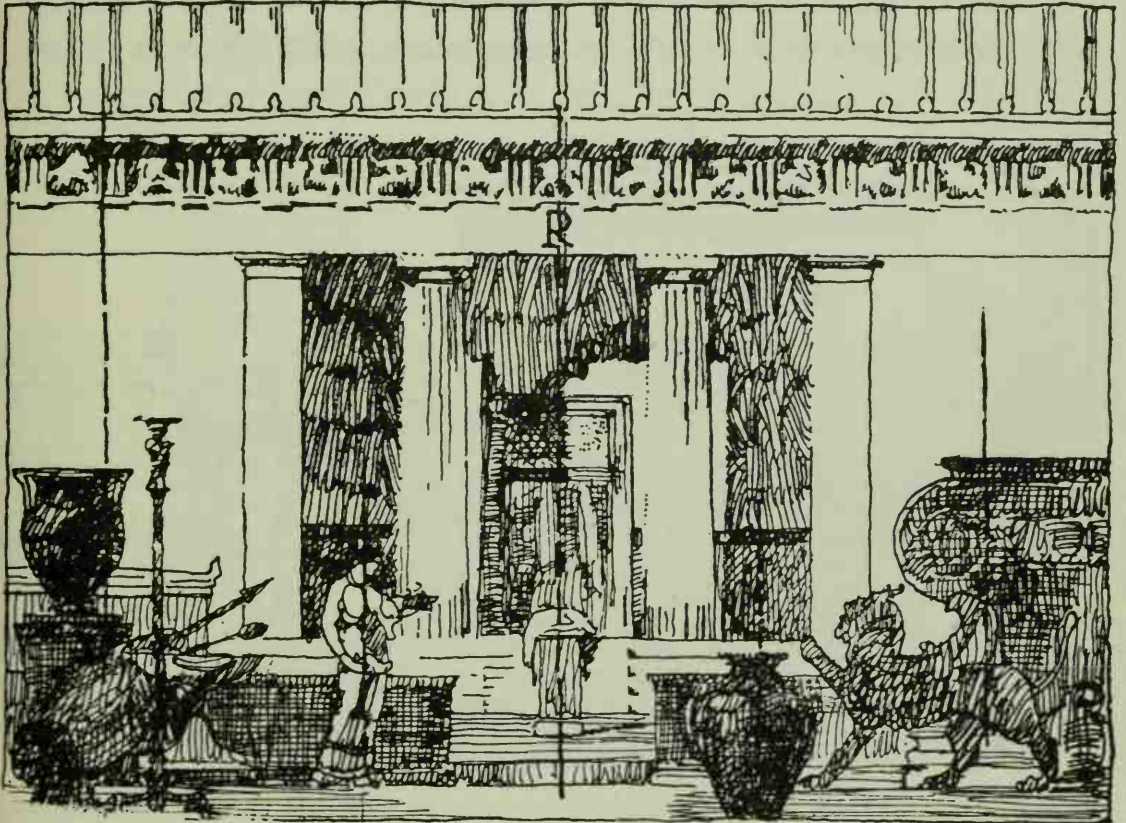


FIG. 26.—A 'balanced' architectural composition (based on an A.A. student's drawing) in which the subsidiary elements to the right and left are different in shape, but form a general balance of 'weight.'

of vision the elements which have been correctly placed to result in unity. The eye grasps, as it were, not one object, but a balance of objects. Such cases occur, however, more frequently in pictorial than in architectural compositions.

The effect of grouping in composition, resulting in a focus whose position is at the centre of gravity of the picture, is similar in principle to the composition of forces in mechanics.

A number of isolated forces in mechanics may be composed into a single force termed the Resultant. The direction and position of the resultant will vary according to the weight and direction of its components, but it will pass through the centre of gravity of the particular group under consideration. In the same way the grouping of a number of elements in a composition tends towards a resultant effect, and this effect will reach its maximum intensity at a point

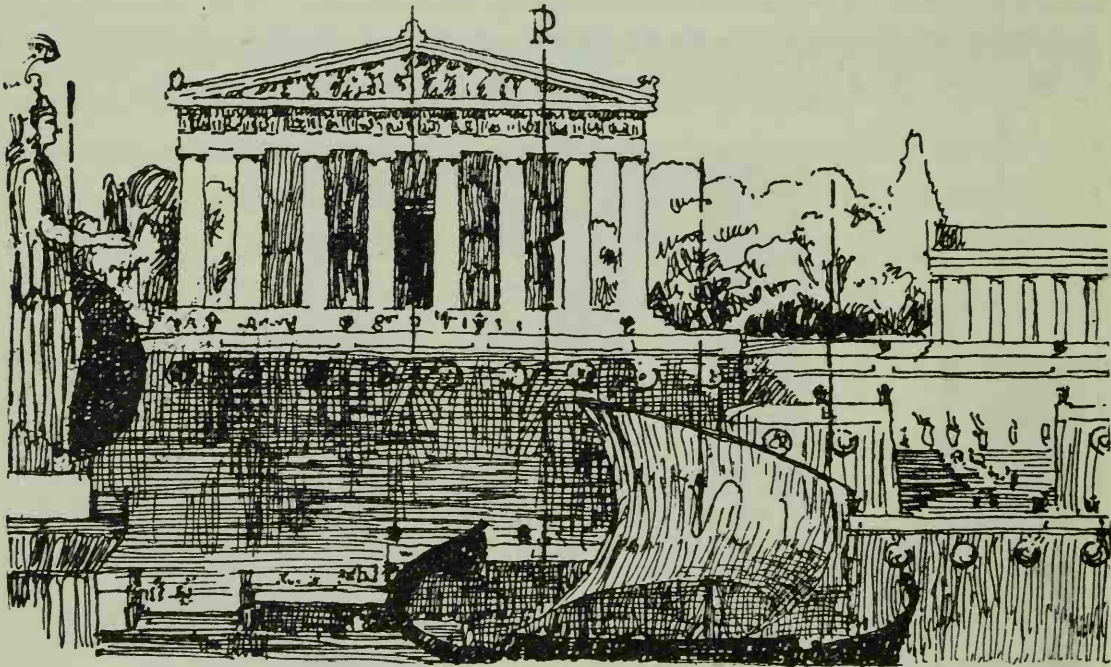


FIG. 27.—An unsymmetrical composition (based on the work of a student of Columbia University) in which there is a free arrangement of elements which combine to produce a centre of gravity which is practically in the middle of the picture.

which is the centre of gravity of the composition. In order that the composition should be satisfactory, this centre of gravity should not be awkwardly situated—for example, at the extreme edge of the composition—for the eye demands stability, and stability is best realized in an approximately central position, which is one most favourable to balanced and ordered arrangement.

A knowledge of this principle will enable us to compose through a cultivation of the practice of visually weighing one element with another, and subsequently placing them so that they form a nicely balanced picture, with a well-placed centre of gravity, and this quite independently of whether the elements are of the same type or are, on the contrary, of all sorts of shapes and sizes.

The figures 26, 27, 28, 29 illustrate architectural 'compositions' and buildings in the drawings of which the

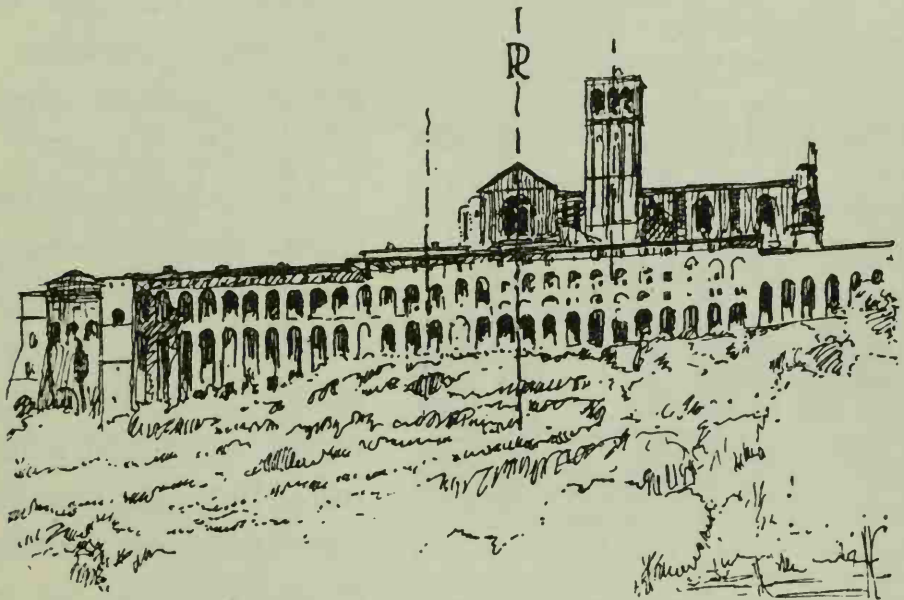


FIG. 28.—The church and convent of San Francesco, Assisi. A free and unsymmetrical composition.

dotted lines show the various centres of interest corresponding to the forces in mechanics. These 'compose' in such a way as to give a main Resultant axis of interest which indicates the centre of gravity of the group. The centres of gravity of the compositions are indicated in the approximate position in which the trained eye seems naturally to place them, though it is only in the case of a perfectly symmetrical composition that the placing can be

mathematically determined, since it will then be in the exact centre of the composition. It should be noted that in architectural, as well as in pictorial compositions, an appreciation of the 'weight' or importance of an element is not arrived at by visualizing its size alone. Colour, tone, texture, the strength and vigour of its design, have a strong effect on its value in the picture, and we may therefore find, in a picture or a building, a large and faintly emphasized

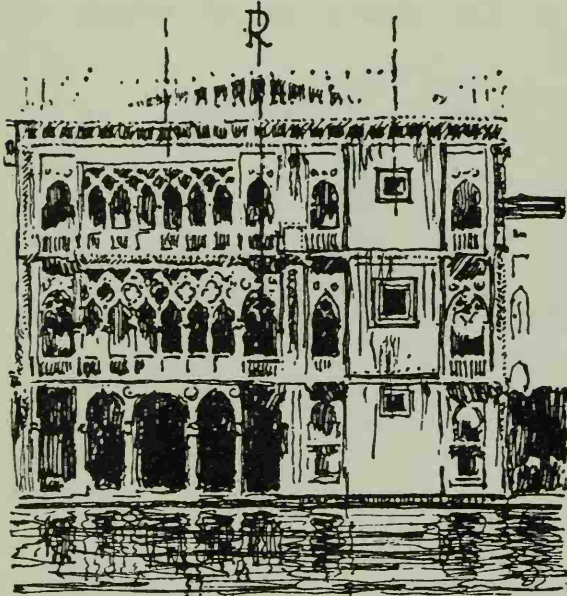


FIG. 29.—The Casa d'Oro, Venice. A very delicate and clever adjustment of 'weights' to produce a central focus and a balance in a composition really consisting of two elements, but in which the presence of a third is suggested, thus avoiding duality.

mass on one side being balanced on the other side by a smaller but more vigorous element (Fig. 26).

It must not be inferred from these deductions that lack of complete balance is to be deprecated either in a picture or the design of a building, but at the same time the designer must remember that no composition should produce a feeling of discomfort or

clumsiness through injudicious disposition of emphasis, and that there is a certain limit beyond which a shifting of the centre of gravity produces what is commonly described as 'top-heaviness' or 'lop-sidedness.'

In order that a sense of composition may be developed, it is advisable to practise the production of satisfactory arrangements of simple shapes, either light and dark geometrical figures, or architectural masses shaded in different

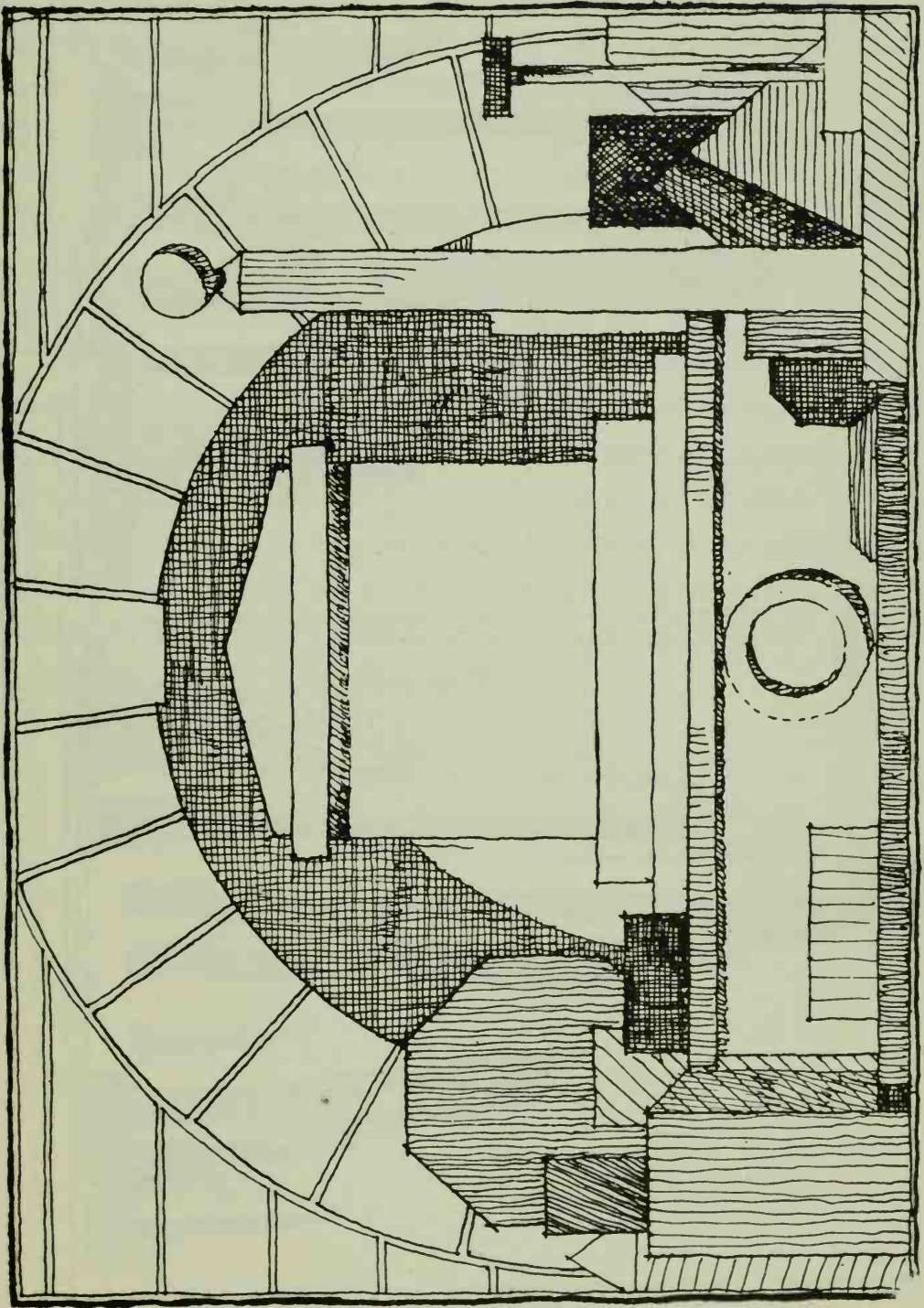
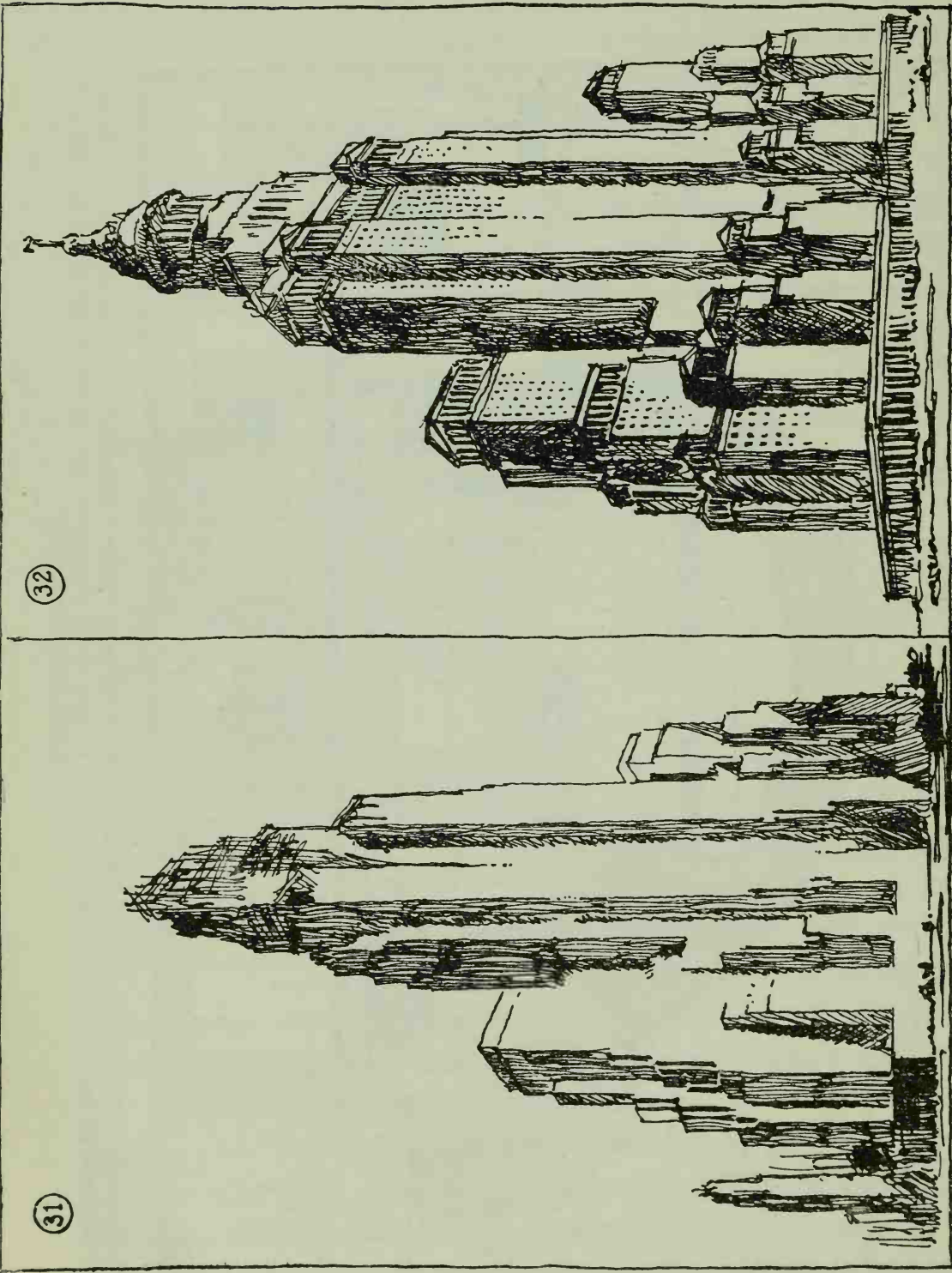


FIG. 30.—A composition of geometrical shapes and simple forms, in which varying weights and tone values serve to form a balance between elements of widely different shape. In spite of lack of complete symmetry the centre of gravity remains in the middle of the picture.



Figs. 31 and 32.—Sketches based on designs by Helmlé and Corbett for the 'Skyscraper of the Future,' showing how simple geometrical shapes (31) form the basis of the finished architectural conception (32).

depth of tone (Fig. 30); for the faculty of appreciating the proper proportioning and placing of elements, of whatever nature, to form a unity of composition, is the secret of ability to design and compose with grammatical correctness in the language of architecture.

It is extremely important for the student of composition to bear in mind that the correct handling of complex architectural elements cannot be attained until the appreciation of the composition of simple forms has been arrived at. Architectural elements are neither more nor less than geometrical shapes and forms which have been endowed by the designer with attributes of life, interest, purpose, and function (Figs. 31 and 32), and the chief failure of bad architectural design lies in lack of power to handle simple form in such a way as to produce good proportion in the relation of the main masses, not only to each other, but to the buildings as a complete unit.

III

The Element of Contrast

As we have already inferred, it is not entirely sufficient, for the production of a satisfactory composition, that correctness of the proportion of its individual elements should be attained and that unity should result. It is necessary also that the composition should avoid monotony, and that it should have *interest*. Good proportion in each separate element will provide a certain interest in itself, but it is necessary also that the relationship of the elements one to another be made interesting. This interest will be obtained by a judicious introduction of variety or contrast.¹

Good proportions in any composition will be found to depend on certain effects of contrast, and we may almost say that the obtaining of good proportions, in a general sense, is synonymous with the obtaining of good contrast. In effect, it is impossible to produce such weaknesses as competitive equalities and dualities, if a proper contrast in proportions be present.

It is a notable fact that in everyday life one of the greatest sources of pleasure to the individual is that furnished by contrast. In effect, contrast is equivalent to absence of

¹ It may be objected at this point that we are introducing the subject of Contrast, while omitting to make mention of Harmony. It should be understood that the word Contrast is used for lack of a better descriptive term ; it must not, however, be confused with Discord. Harmony in design is covered by an examination of the Principles of Unity and the necessity for good proportions, which are those essentially harmonious. Proper contrast will be found to conduce to harmonious design, in the same way as different notes in music may form a harmonious chord. We here purposely omitted the term Harmony as being too general and allusive. We assume that it is understood that our aim is to analyse and synthetize good composition, which is *harmonious* composition.

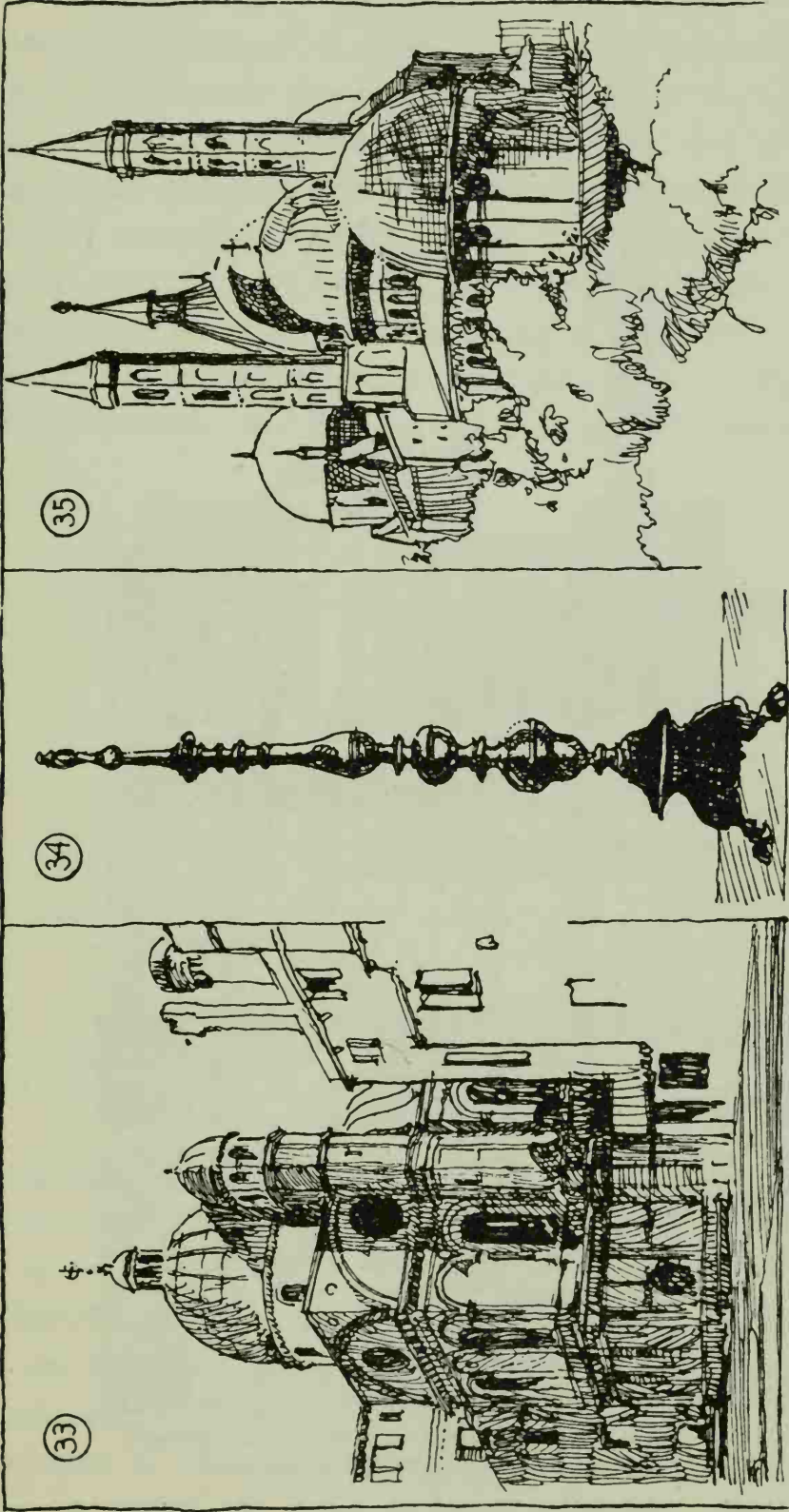


FIG. 33.—Church of the Miracoli, Venice. Contrast of elementary form, the cube, cylinder, hemisphere, octagon.

FIG. 34.—Contrast of line in the contour of form exemplified in a candelabrum.

FIG. 35.—The Chiesa del Santo, Padua. Contrast in proportion between forms of the same type, and general contrast of geometrical shapes.

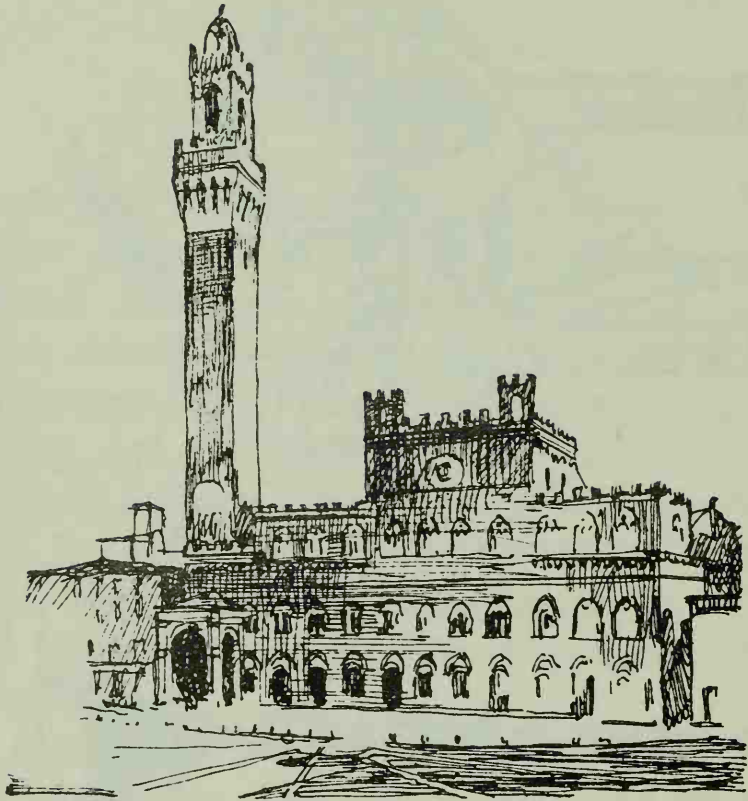


FIG. 36.—The Palazzo Comunale, Siena. Magnificent contrast of horizontals and verticals.

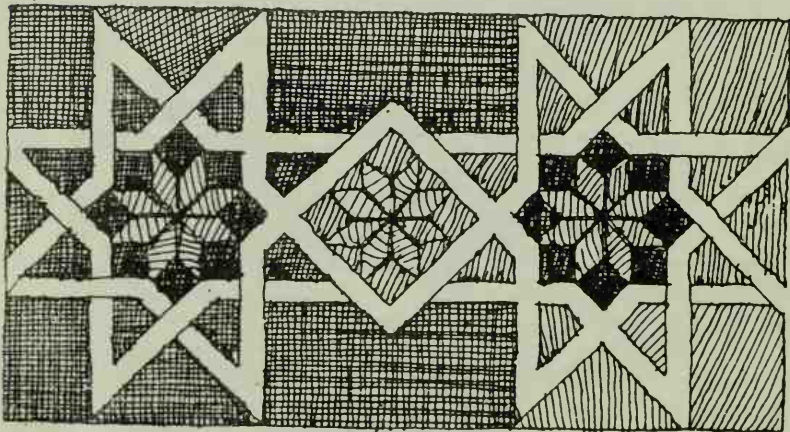


FIG. 37.—Geometrical pattern from the Cathedral of Monreale. Repetition relieved by contrast of form and tone.

monotony, and supplies relief to the brain and the senses, so that it is fortunate that it is amply provided for by Nature and by man-made custom. Heat and cold, day and night, sunlight and shadow, fire and water, hills and plains, are but a few natural examples, while such opposites as work and play, exercise and repose, are the result of the necessity of contrast of action in the functioning of the human machine. It is safe to say that were such contrasts, more or less violent, to be eliminated, existence would lose its vital interest.

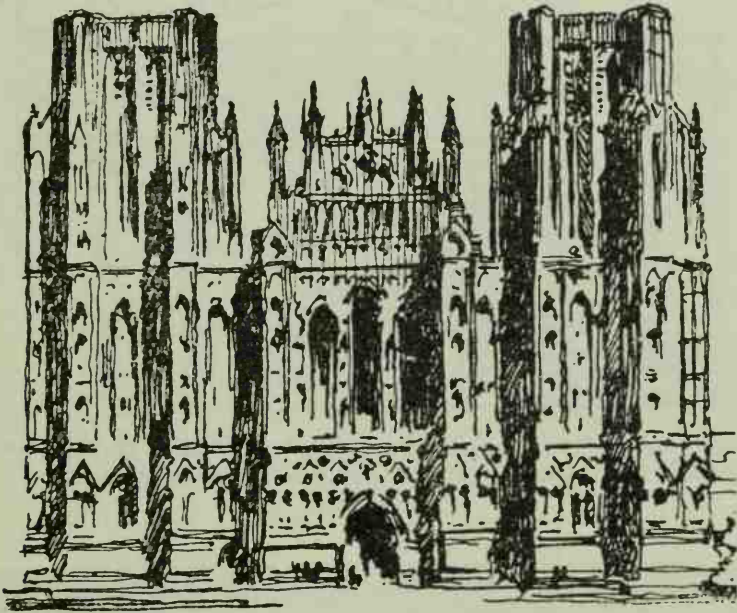


FIG. 38.—West front of Wells Cathedral. A fine composition conveying an effect of decision.

In design of any kind the same need for a stimulation of interest is felt, and the designer should remember that there is such a thing as an almost monotonous perfection. The breaking of a rule, the whimsicality of a departure from an expected form, has at times the virtue, by the piquant contrast which it affords, of accentuating the correctness of the composition, while at the same time adding a sense of freedom and vitality. For human

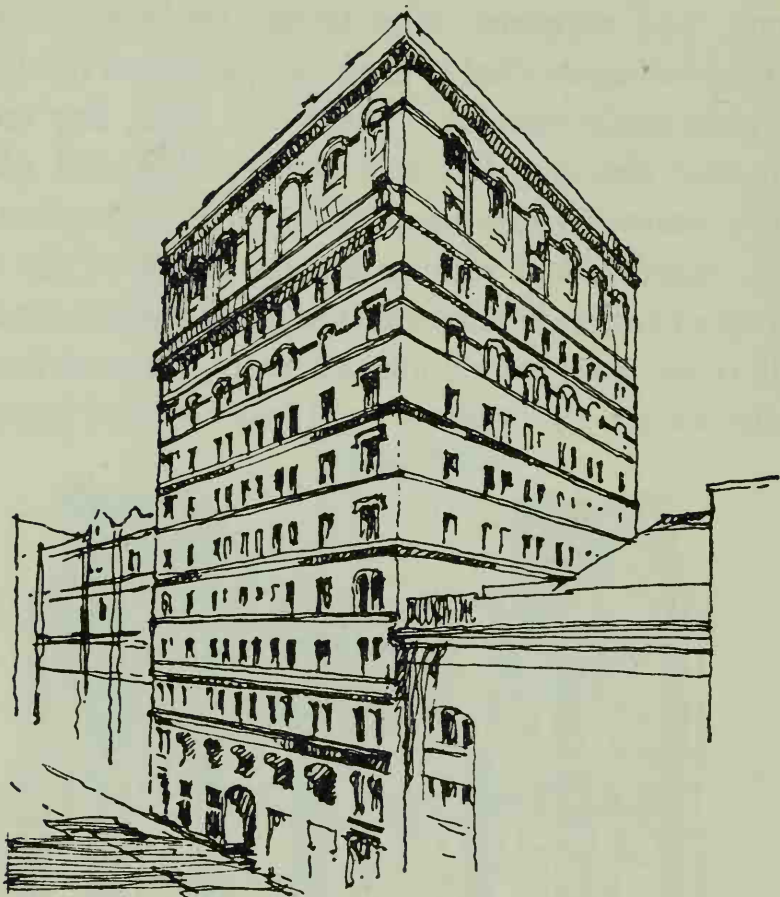


FIG. 39.—A New York office building. Indecision through continual stressing of horizontals in a vertical mass.

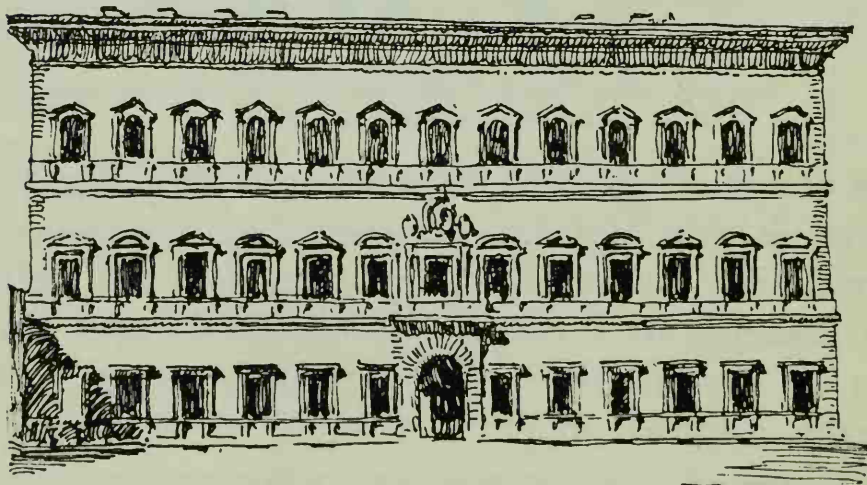


FIG. 40.—Farnese Palace, Rome. In spite of the fine feeling of this building the solids and voids are hesitating and weak in their relationship.

appreciation delights in minor and joyous imperfections as a contrast to a stern general rectitude.

Contrast in architectural composition is of secondary importance only to Unity of design, and a feeling for its perception and proper employment is bound up with the cultivation of the sense of Proportion with which it is indissolubly connected. The use of contrast can only be learnt by experience and a development of the æsthetic sense, but here again there are elementary principles to guide us.

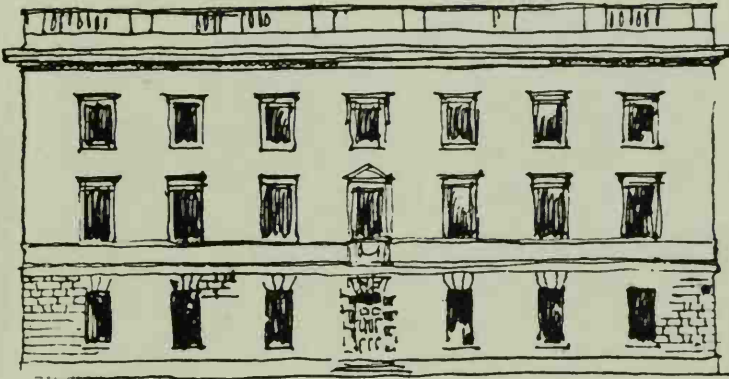


FIG. 41.

The Chapel, Trinity College, Dublin. Solids clearly dominating over voids.

Contrast in design is applied over an almost limitless field. In the first place we have a contrast of form and mass, such simple contrasts, for example, as that of the sphere and the cube (Fig. 33), and contrasts in bulk between figures of identical type (Fig. 35). We then have contrasts of line, line being considered either as the contour of objects (Fig. 34), as the silhouette of pattern (Fig. 37), or by extension as 'direction,' such as verticality, horizontality, obliqueness (Fig. 36).

Contrast again is applied to colour, such as black and white, red and green, or to depth of tone, such as light and dark (Fig. 37). Or again to texture, such as rough and smooth, and to 'weight'—light and heavy. It is in short applicable to every object, form, or abstract quality which has an opposite which can be expressed in the terms with which we are dealing in a work of architecture. In the use of contrast, the golden rule should be followed that there should be no hesitation or lack of definition unless these be

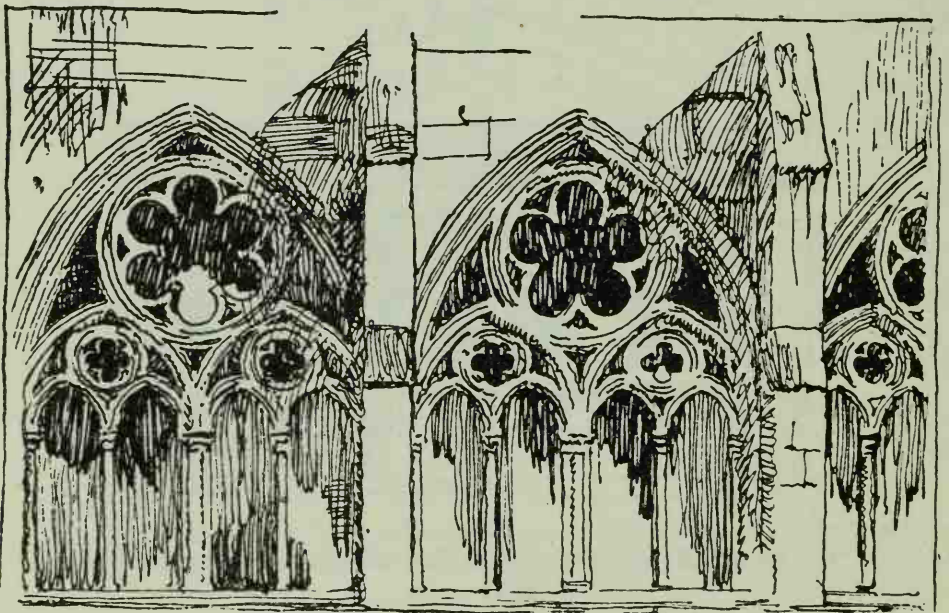


FIG. 42.—The Cloisters, Salisbury Cathedral. Voids dominating over solids, typical of the Gothic spirit.

introduced with intention as a foil or contrast to obtain elsewhere a greater emphasis of strength.

The main lines of a building should produce an effect of decision (Fig. 38), and all its subdivisions and elements should be imbued with a similar quality. The elevation of a building in which the main lines are horizontal should produce a definite sense of horizontality; there should be no hesitation as to whether it is a vertical or horizontal scheme. A tall building should not be continually

sub-divided by strong horizontal lines, giving an impression of perpetual striving after an effect of horizontality, unless such divisions are employed for some such reason as a desire to lessen the apparent height. And even then such an attempt creates an impression of weakness of idea, a



FIG. 43.—Lord Leicester's Hospital, Warwick. Contrast of materials, tone, and colour, harmonized by judicious handling.

desire to conceal rather than frankly to express, an indecision and lack of conviction (Fig. 39).

The simplest forms are subject to the same law. A square should be an actual square, and not a figure which is just a little more or less than a square. An ellipse should have the properties of its form, and not be merely a slightly bulging circle. There are certain circumstances in which

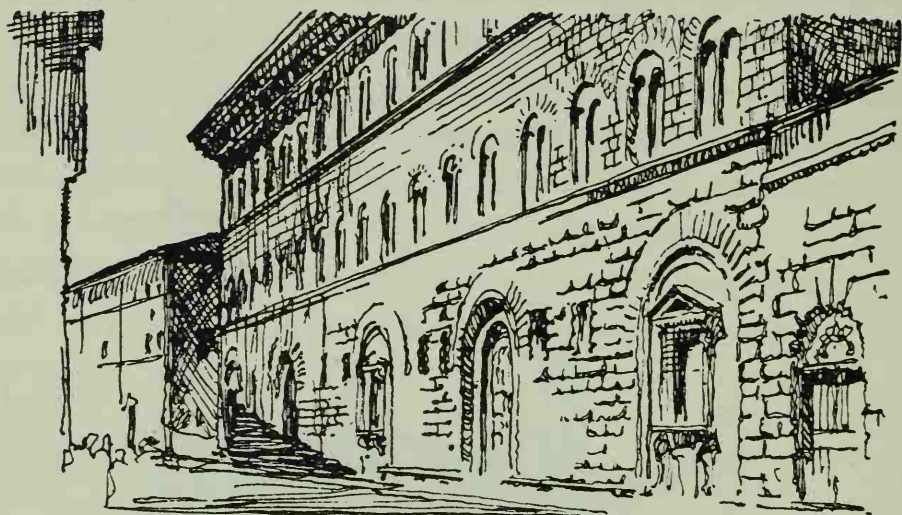


FIG. 44.—Riccardi Palace, Florence. Note the contrast in the surface treatment of the masonry in ground and upper stories.

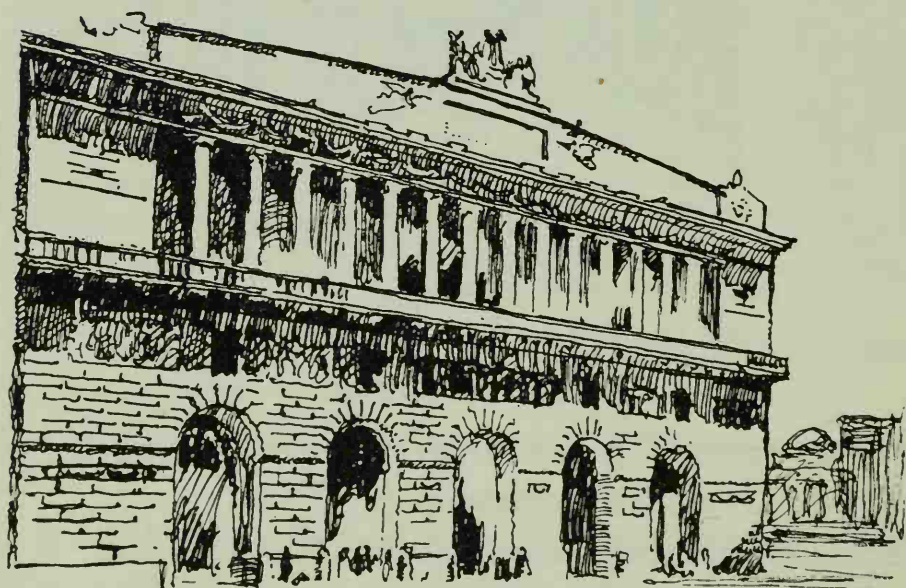


FIG. 45.—The San Carlo Theatre, Naples. The contrast of character and scale between the two stories is so marked as almost to produce an effect of separation.

this principle of definition does not hold good, but generally speaking the eye prefers complete decision to an approximation, and we are not dealing here with subtleties and refinements.

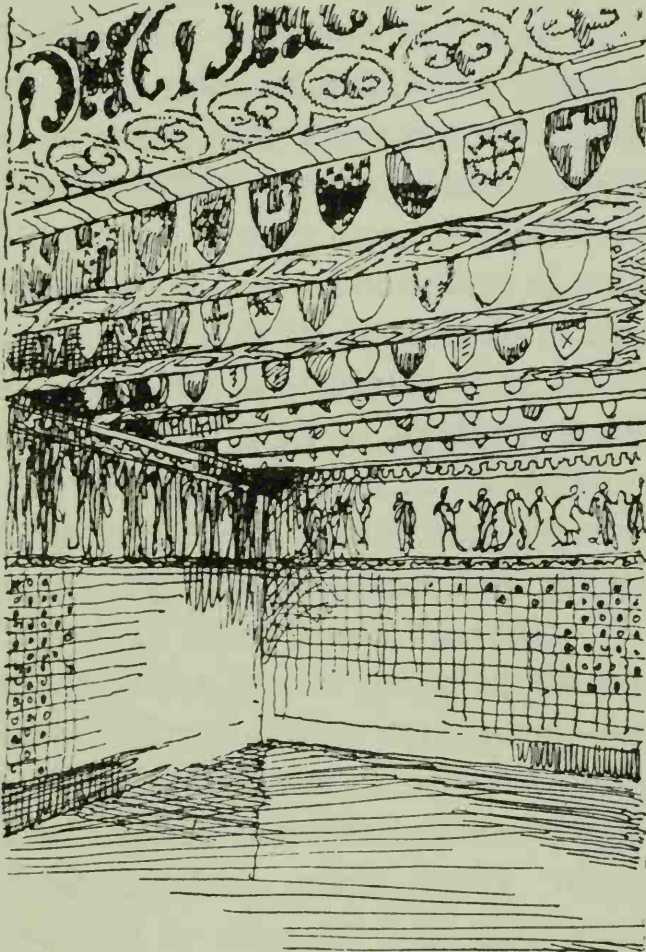


FIG. 46.—Reconstruction of a room in a Swiss house, Zurich. The interest is here dispersed by excessive use of contrast, resulting in a lack of main contrast, e.g. between ceiling and walls. A solution might have been found in a simpler wall treatment.

One of the most general applications of contrast which presents itself in the design of architectural elevations is the proper treatment of solid and void, usually termed the problem of fenestration. As in most buildings (except

those few types in which fenestration is not required) the arrangement of doors and windows will form one of the dominating factors of the design, it is necessary that these 'voids' should be of good proportion in themselves, and should provide proper contrast with their opposites, namely, the 'solids' of the wall surface. To provide contrast, competing equality with its indecision and weakness must be avoided, hence the necessity for setting out the voids in such a way that they are definitely either wider or narrower than the wall surfaces between them. Figs. 40-42 illustrate different effects in well-known buildings, depending on a more or less strict observance of this rule.

In addition to such contrasts as that of solid and void, there will be the contrast of light and shade, formed not only by the difference in colour, tone, and texture of the building's material, but also by the actual shadow cast by projections on the wall surfaces (Figs. 38, 43 and 44).

Materials of different kinds, such as brick and stone, rough-cast and tile hanging, should not be found in exactly equal masses—one or the other should dominate. Nor should the projections in façade necessitated by the plan, or by the requirements of external design, be all precisely similar in depth. Here, again, contrast should be introduced, or the vitality and strength of the design will be adversely affected. It should be clearly understood that there is a danger in the excessive use of contrast, as in the opposite defect of monotony. We are here faced with the question of degree and proportion, and the designer must acquire his own experience. A too constant introduction of contrasts will result in loss of repose, and will produce, through a dispersal of interest to innumerable subsidiary parts of the design, the very weakness which it is intended

to overcome (Fig. 46). For, paradoxically, contrast too freely employed will become monotony. Again, excessive violence of contrast may defeat its own ends, for instead of accentuating, for example, the dominating proportions of one element over another, it may result in complete separation of these elements, and break up the composition. Such a separation may arise where a too strong contrast of material occurs, or where there is a sudden dividing line between the character of the ground and upper stories of a building (Fig. 45).

IV

Contrast in Form and Mass

CONTRASTS which we have discussed, such as those of solid and void, are perhaps the simplest and most readily understood, and serve as an introduction to the more difficult subject of the consideration of contrast in form and mass. A single building, and more frequently still, a group of buildings, will almost certainly present to the designer certain possibilities in the use of contrasts in treating his main masses. The necessity for Unity, for a Dominant in the composition, will have dictated the relative bulk of the masses under consideration, but there still remains the question of the influence of form on these masses, and the effect which may be obtained by contrast of forms.

It is visually apparent, for instance, that a very marked shape, having an extremely definite form, or line of direction, may produce a more startling and vigorous effect on the eye than a much bulkier but amorphous shape. This question has been already alluded to when treating of the 'weights' of light and dark masses in abstract composition (Fig. 30). An example of such a case is given in Fig. 47, where the comparatively slim tower forms an effective balance of contrast with the bulky horizontal mass of the building to which it is attached. There are, however, many cases of buildings in which the effect of contrast has been missed. Such an instance occurs in the Church of the Sacré Cœur in Paris, where a strongly marked effect gained by a massing of cupolas round a central dome

finds an unfortunately close competitor in a rectangular campanile rising to approximately the same height as that of the central dome, and having a verticality which stresses it as an accent in the design. The dome and the campanile,

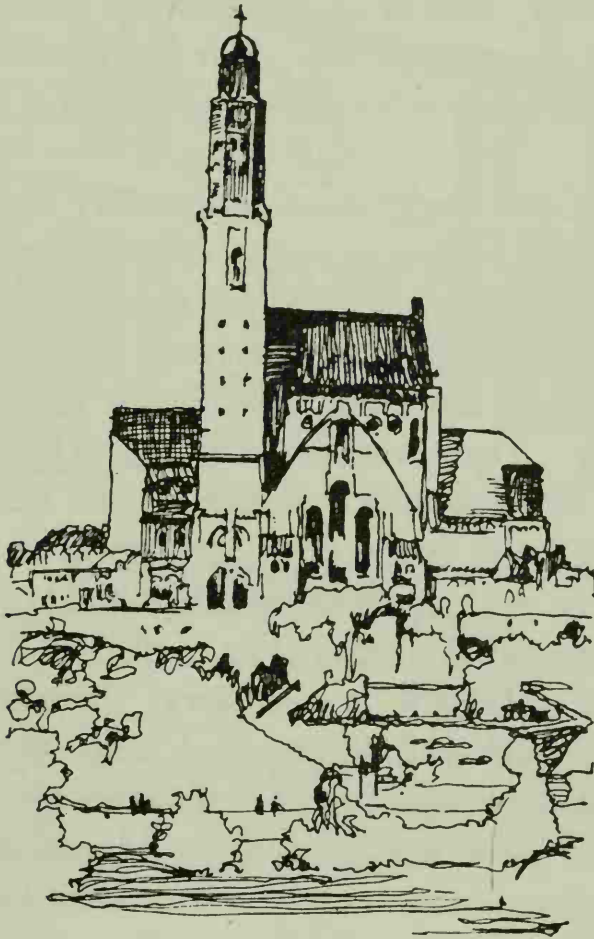


FIG. 47.

Church in Stockholm. Contrast in shapes both in the main mass and in the form of the tower. Dominant verticality.

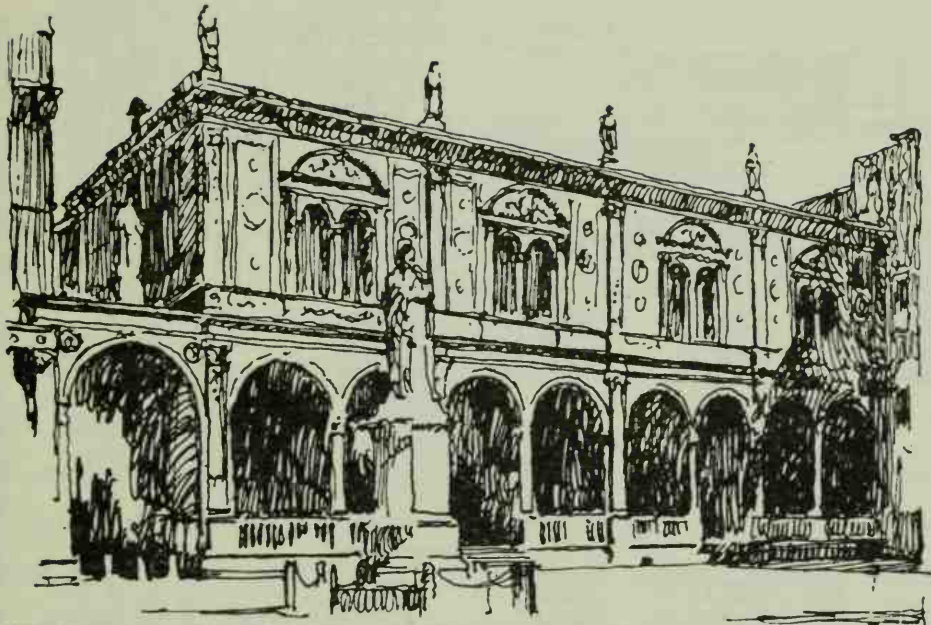
so dissimilar in bulk and shape, are yet vying with each other for pride of place in focal interest, and the composition of the Sacré Cœur loses much of its beauty thereby.

One difficulty of the designer will always lie in the attainment of the proper degree of contrasts. If pushed to an

extreme degree there will result merely discords; the effect, for example, of the interest of the contrast between strongly marked verticals and horizontals may be utterly missed if the proportions are such that instead of one form serving as a foil to the other, each is so individually insistent that the eye finds them in competition. For the avoidance of such competition, we must refer once more to the necessity for a Dominant.

The value of the contrasts of elementary forms has been illustrated by such instances as the use of spherical, conical, cylindrical, and other forms for the domes and roof coverings of buildings, such forms deriving a large measure of their interest from the contrast with the rectangular bulk of the building. Towers which combine in their design the rectangle, the octagon, the cylinder, or the sphere, are not uncommon, and the contrasting interest of these forms is at once apparent in the play of light and shade which results from their different contours (Fig. 47). In the design of architectural elements it is necessary, therefore, not only to consider the structural, practical, and logical requirements, but to envisage forms from the purely æsthetic point of view. Structural, logical, and truthful expressions do not, of course, automatically endow a building with the attribute of beauty, but merely satisfy a sense of fitness, and invite an emotion of a totally different kind from that produced by beauty of form.

This fact explains the retention in architectural design of many features which are of no structural value, and which, in addition, are quite illogical from a practical standpoint. The treatment of a window head, for instance, may logically demand a cornice supported on consoles, as such a projecting hood will assist in sheltering the window from the



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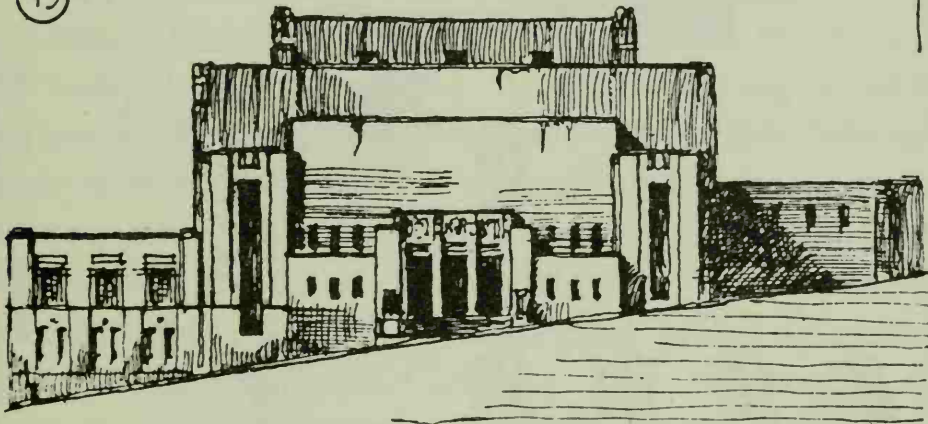


FIG. 48.

Loggia in the Piazza dei Signori, Verona. Pilasters as a useful element in design, providing the accents and rhythm, and breaking up solids so as to obviate competition with voids.

FIG. 49.

Prize design for Scottish Rite Competition, Portland, Oregon, by Sutton and Whitney. Study in the treatment of rectangular forms without the aid of classic detail.

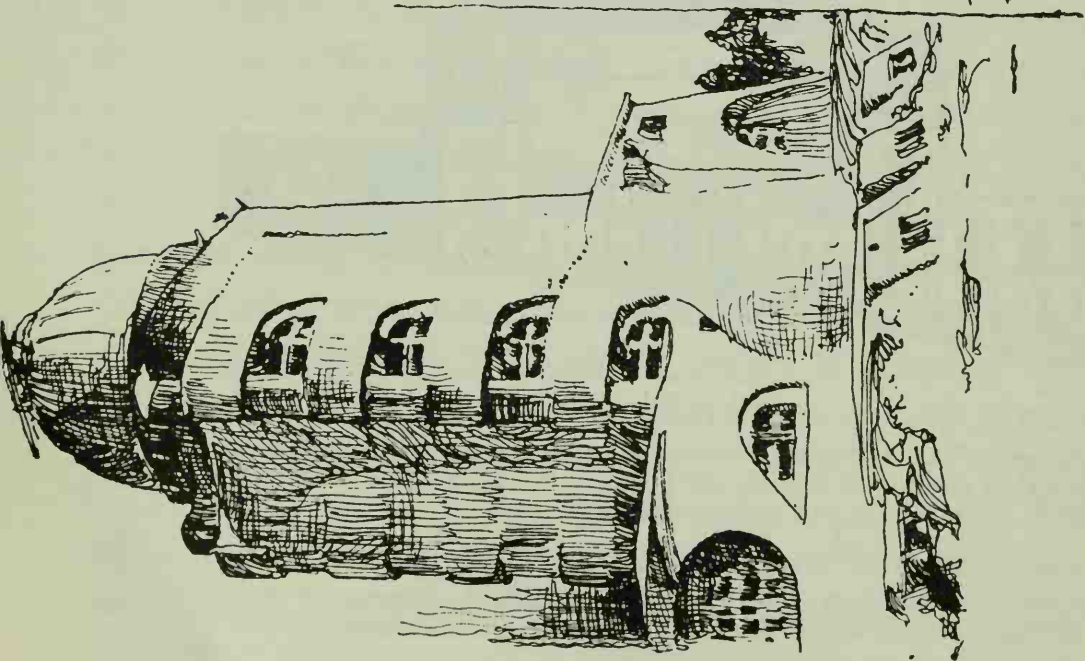


FIG. 50.—The Einstein Tower, Potsdam, by Erich Mendelsohn. Expressionism in plastic form. Architecture bordering on the sculptural, a treatment logical only where warranted by the material and the importance of the idea expressed.

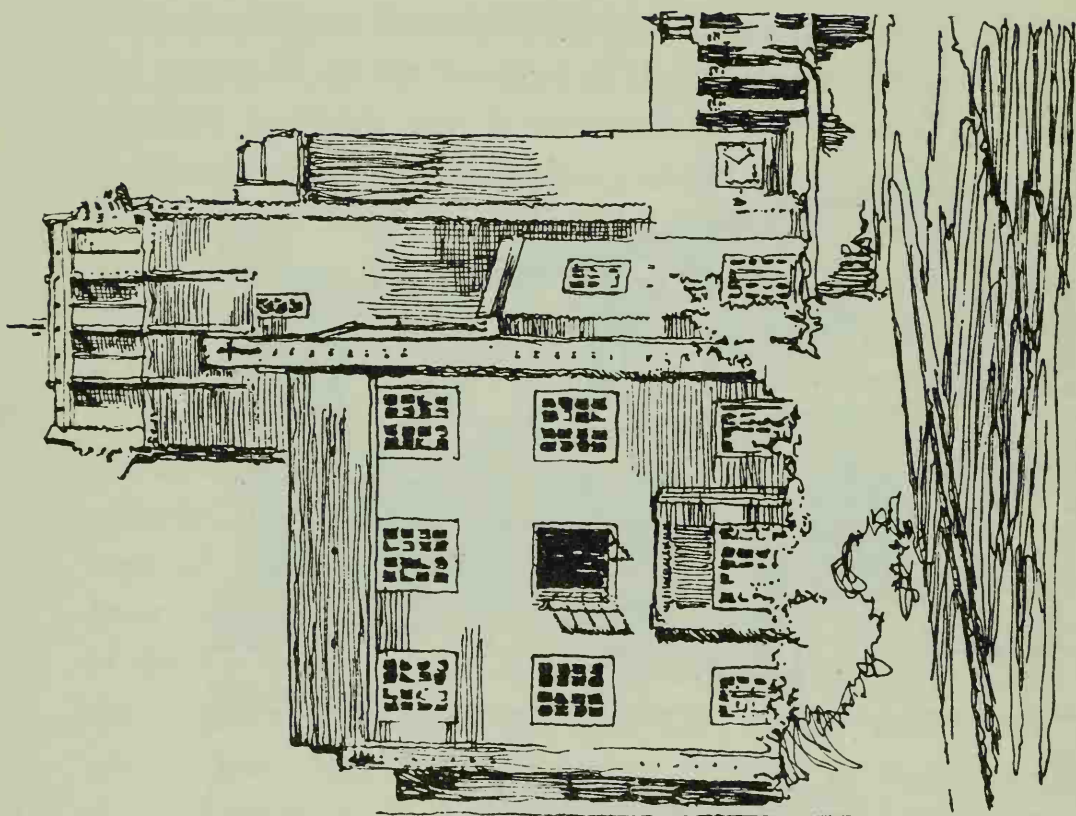


FIG. 51.
Seamen's Union Building, the Helder, Holland, by P. Kramer. A dignified and well-massed handling of form with accompanying appropriate detail.

weather. It is not necessary, however, that this cornice should be completed by another in the form of a raked pediment. If the latter is necessary in order to throw the water off sideways, then the horizontal shelf below becomes itself redundant. Yet both features may be required in an architectural scheme, merely because of the interest which they create in the form of contrast of line, shape, shadow, etc., with some other element with which they are related in the design.

The presence of such apparently illogical forms, if these are necessary from the point of view of composition, is therefore not to be hastily condemned. The necessity, so often felt in composition, of introducing strong vertical elements in order to create sub-divisions, or to accentuate a sense of direction in a form, partially explains the reluctance of architects to abandon the use of the applied Orders, whose presence may be required for no practical purpose whatever (Fig. 48). Columns are logical as vertical supports, being in their simplest form merely detached sections of wall, but their use as applied ornament, supporting nothing and yet requiring a substantial base to bear their functionless mass, is less defensible. Yet three-quarter columns and pilasters are extremely useful as elements of design in pure form. Clothed with the beauty of proportion and detail which represents something approaching finality in this particular form of design, and having therefore inherent decorative qualities, classic columns and entablatures form a means of expressing form and line contrast which is tried and ready to hand. Small wonder, therefore, that the architect seizes on the Orders to provide his dominant decorative effect. Similar effects, of a much more interesting and stimulating character, could certainly

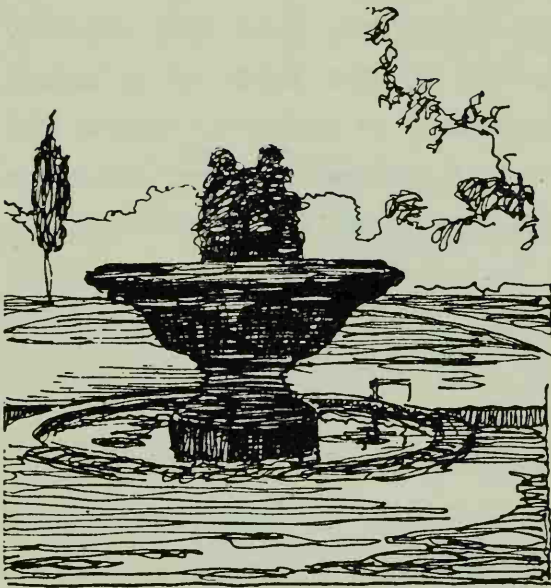


FIG. 52.

Fountain in Borghese Gardens, Rome.
Importance of line as contour of objects.



FIG. 53.

Inn sign from Guarda (Engadine).
Importance of silhouette.

be obtained by the handling of form in some other way. But this entails imagination and effort, and it requires a great deal of both to originate a series of verticals and horizontals as satisfactory as that which is furnished by a well-selected classic Order. If the designer realizes that the Orders are a very subtle and refined expression of some of the principles of pure design, and not merely a more or less fashionable trapping to be borrowed and applied without reason, he will then be in the position to tackle the problem of using them with fitness or of creating his own set of elements to take their place.

Mr. Roger Fry has declared (cf. *The Architectural Heresies of a Painter*) that one of the main weaknesses of the

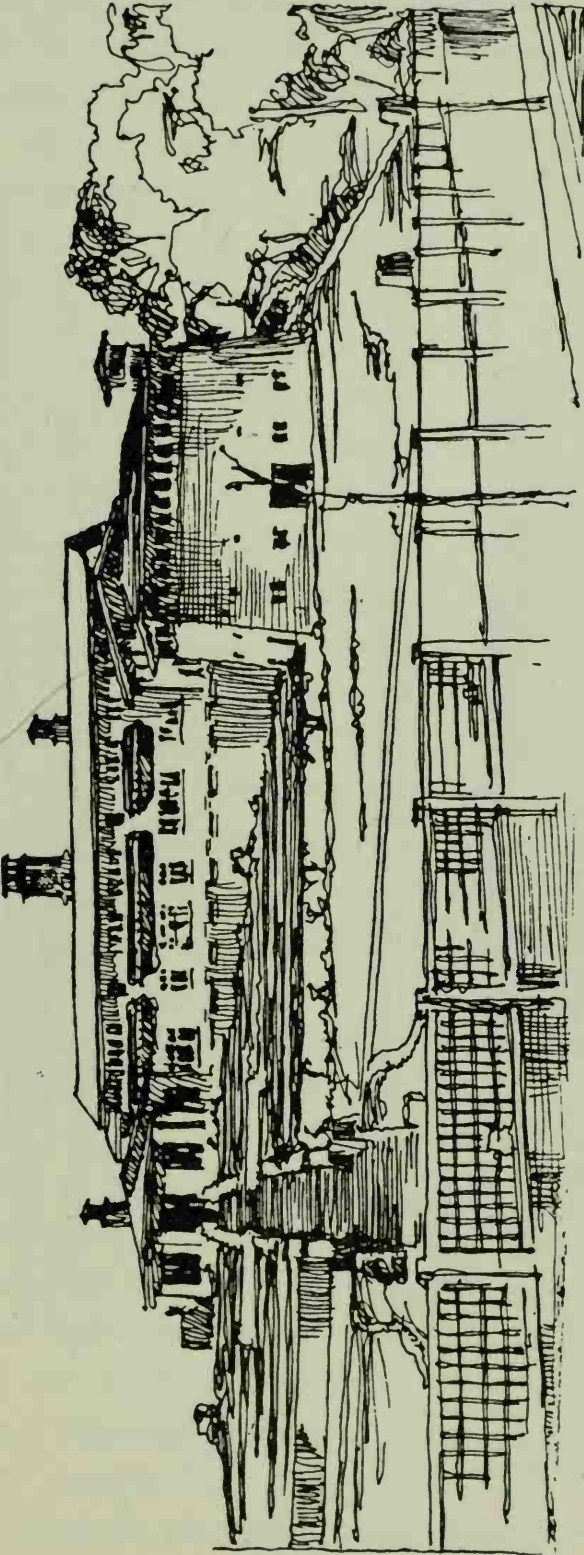


FIG. 54.

Residence in Berkeley, California, by Louis Mullgardt. Not free from tradition, but depending for effect on decision of idea and plastic treatment of form masses to suit the site. Note unity of house and landscape.

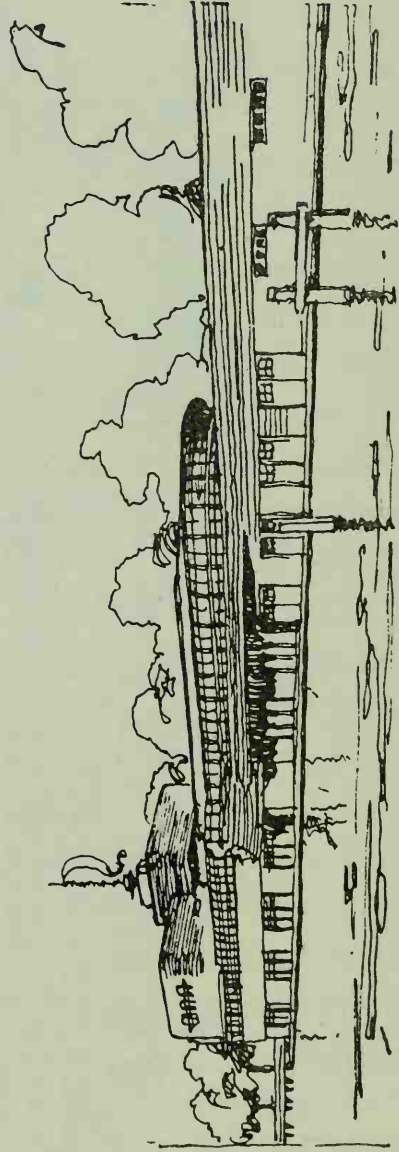
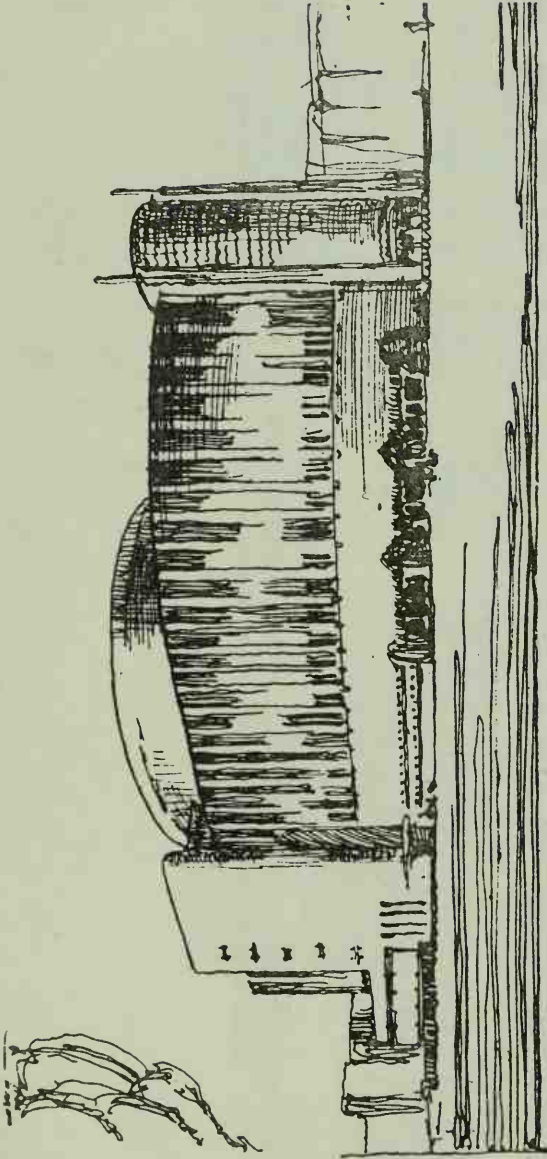


FIG. 55.—Design for a National Theatre, Amsterdam, by Th. H. Wijdeveldt. Expressionism, study of pure form, breadth of treatment, consideration of site in determining shapes.
FIG. 56.—Design for Boating Club, Amsterdam, by de Klerk. Expression of function, handling of form to harmonize with building's purpose and situation.

architect as an artist lies in his inability to realize plastic design or, in other words, successfully to handle form.

English architecture of the last hundred years justifies this criticism, but recent development in training in design, coupled with the example of architects in other countries, leads us to hope that this disability is a passing phase. There is in Europe a notable architectural reaction against the production of effect through the mere application of the externals of style or the grafting of interesting features on to forms themselves uninteresting. Modern Dutch, German, and Swedish design, and some American work also, reveals at times an effort to grapple with pure form, and mould it into architectural shapes. Buildings are not, however, made of plastic, but of hard and resisting material, and forms suitable to clay modelling can only be realized in the materials of building at the cost of fantastic difficulty and expense (Fig. 50). Hence the danger of failure in extreme essays in plastic design.

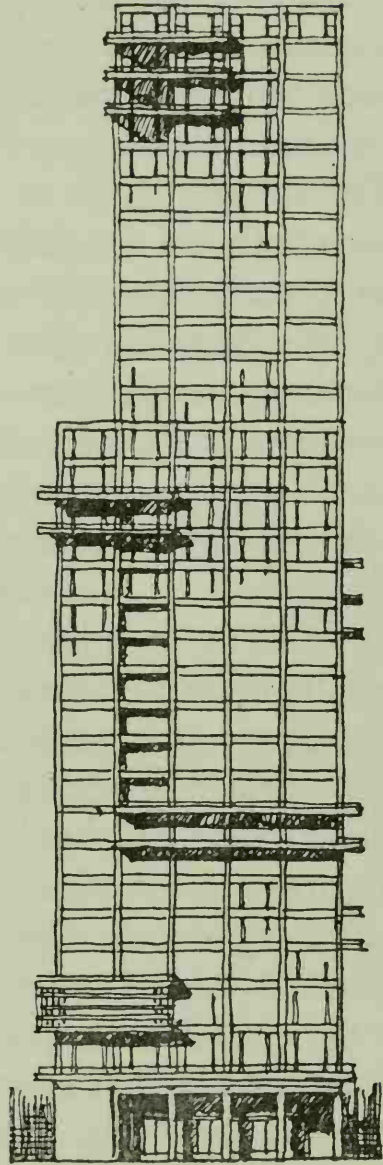


FIG. 57

German design by Walter Gropius and Adolf Meyer for Chicago Tribune Building. Study of massing of elementary form, relieved by accents definitely placed. The building is in reinforced concrete and glass.

But the examples given

in Figs. 49 and 51, and even that of Fig. 57, with all its obvious weaknesses, show that beneath a certain wilfulness is latent the promise of power and breadth of treatment which can only be produced by vigour and unity of conception in the handling of form in bulk, regardless of subordinate details.

The study of form in such an art as architecture, which is essentially an art dealing with static elements, naturally takes precedence over that of pure line, especially since line, when considered as the contour of form, is essentially incorporated with form. Line, however, assumes a great importance of its own, as it may appear as practically independent of strongly modelled forms, as, for instance, in the case of the flutes of a pilaster, or in the jointing of stone or brickwork. Line may also appear as the silhouette of a form which is, or appears to be, practically two-dimensional. The silhouette of an element, such as a weather vane, or the cresting of a roof, may be more important than its actual surface modelling (Fig. 53), and even strongly modelled elements, such as a dome, a tower, or a piece of sculpture, will sometimes count chiefly as dark and strongly silhouetted objects against a light background. Such instances occur when a spectator looks at a modelled object into the eye of the sun (Fig. 52).

It is because line and silhouette impinge so strongly on the vision that their study becomes of high importance, and here again we find that the principles of unity, proportion, and contrast apply in exactly the same way as in the study of mass and form.

The examination of any well-designed silhouette, such as that of a classic cornice (Fig. 58), will reveal the exemplification of the main principles, which apply to both form and

line. Unity is suggested by the general sense of direction of the profile following in this case a general line at 45° with the horizontal. It is further confirmed by the presence of the Dominant, namely the strongly-marked overhanging profile of cyma and corona, which dominate the subordinate supporting bed mouldings of cyma reversa, dentil, and ovolo.

Contrast is exemplified in every line. The cyma reversa consists of two curves, each directly contrasting with the other, and the whole contrasting with the rigid lines of the dentil course above. This course has contrast produced by the spacing of its dentils, resulting in a strongly-marked effect of solid and void. The ovolo contrasts with both dentil course and cyma reversa, and the whole trio of bed moulds with their broken silhouette contrasts with the firm rectangular lines of the corona. The corona itself, in character and form, is in opposition with the cyma recta above it.

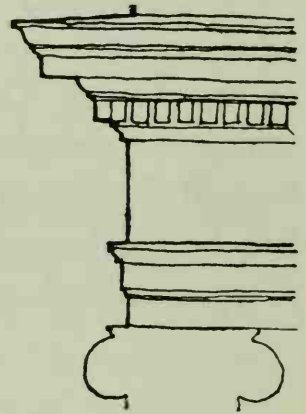


FIG. 58. An Ionic entablature. Contrast in mouldings.

The mouldings of any well-designed profile may be analysed in the same way, and this analysis will enable us to arrive at synthesis of form and line by working on the same principles. In line, as in form, our distaste for hesitation implies a desire for decisiveness. Curved lines in particular, through their fundamental lack of rigidity, demand most careful study and treatment. A weak and undecided curve is actively disagreeable to the trained eye. In the contour of domes, or any silhouetted element, this is particularly noticeable, while

arched forms again must observe the principle of unity and decision.

A contour to dome or arch, which consists of a much flattened semicircle, will contain a short portion of line which is practically straight. The presence of this straight line destroys the unity of the curve, quâ curve, and is yet too indecisive to provide contrast. Curves which are broken or 'bent,' should be sharply broken or have their change of direction definitely marked, a crispness of inflection, or a decisive sense of their interruption being demanded by the eye. Such curves as the semicircle, the ellipse, various forms of Gothic vaulting, etc., have unity through their continuity or the decision of their form contrast, while curves, such as the parabola and the subtle contour of the Greek Doric echinus, have a beauty of inflection which is a delight as a study of pure line. The drawing of a beautiful curve is the production of an artist's eye and hand, but bad silhouettes may be avoided if the basic principles of composition are adhered to.

Secondary Principles

IN addition to the basic laws of unity and contrast we shall find that a further analysis, dealing this time more in detail with the architectural elements employed, will reveal the presence of secondary principles which may be consciously employed to the benefit of the general composition. In the chapter on contrast we have shown that in design we are dealing with elements which may be of opposing form and character. In pursuing the same theme in the analysis of the elements themselves we discover that each element may be composed of still smaller elements, which fall into two main categories, according to their function in the scheme of design.

In effect, we may distinguish in each architectural detail a character peculiar to it, such character being revealed at first sight less by logical examination than by intuition. The two main categories into which these characteristics fall may be termed the 'positive' and the 'negative,' and, as might be expected, they contrast with, and are complementary to, each other.

A straight line, for example, conveys an impression of decision, rigidity, and simple function. A wavy line, on the contrary, produces an opposite effect, one of hesitation, flexibility, and decorative value. The expression of these two contrasting types is 'positive' in the first case, and 'negative' in the second.

In Nature, as in art, we shall find these two types represented, the one direct, simple, and obviously functional, the

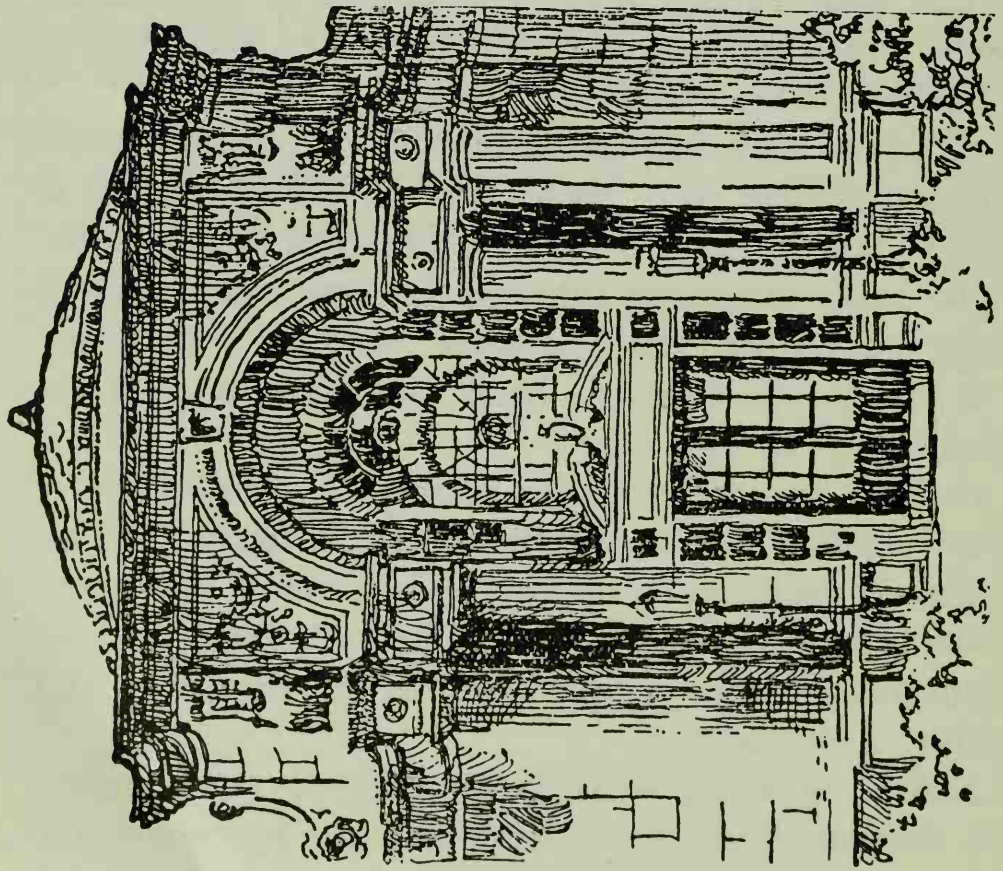


FIG. 59.—The entrance to an American hotel. Here we have 'positive' columns taking the arch weight, columns bearing consoles which are practically 'negative,' and purely 'negative' decoration in the arch spandrels.

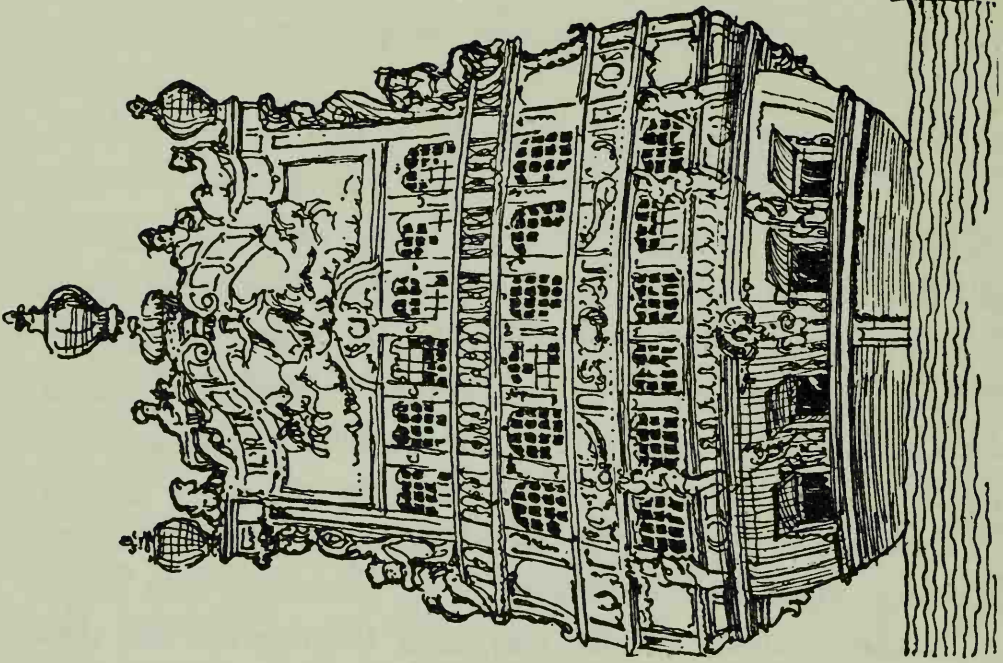


FIG. 60.—The stern of *Le Roi Soleil*, a vessel of the time of Louis XIV. Exemplifies the softening of 'positive' rigidity by 'negative' accompaniments.

other indirect, more passive, and also more complex in character. The trunk of a tree, for example, is a positive element, the foliage is negative. Fire is positive and water is negative. In colour, the red colour of fire is vivid, hot, and exciting, and, like the element, is positive. Green or blue, the colours of water, provide the direct negative contrast. In painting, effective use is made of the contrast of positive and negative. The painters of the Italian schools, in particular, have grasped the dramatic possibilities of

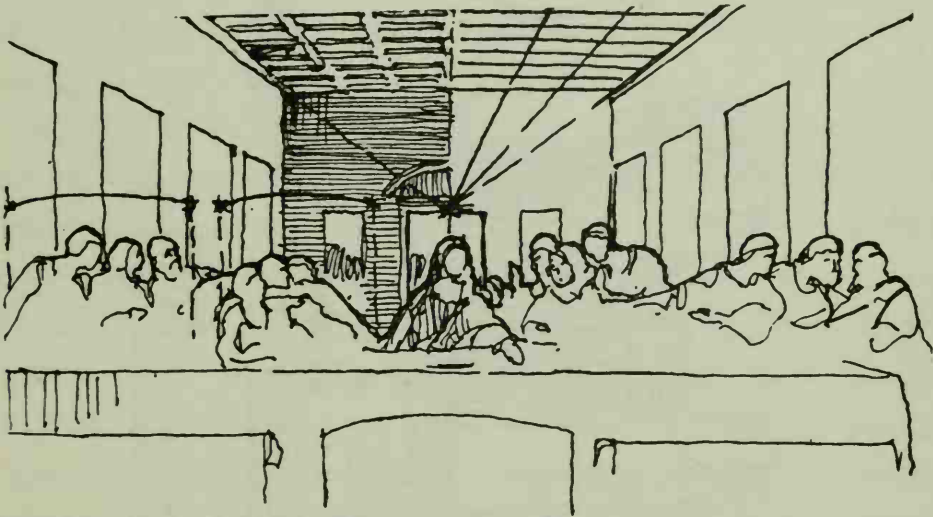


FIG. 61.—Leonardo da Vinci's painting of 'The Last Supper.' Note contrast between rigid architectural background and free grouping of figures, and the method of accentuating the central figure of Christ by converging lines.

contrast. For example, in compositions of figures and groups, decorative, flexible, and complex in design, we often find the introduction of a rigid architectural background which serves a functional purpose of unifying the composition, and provides the positive foil to the negative element (Fig. 61).

In architectural design we find innumerable analogous examples. A series of columns, positive in the weight-bearing and actively functional capacity, receives the passive, static, and negative lintol, an element which is

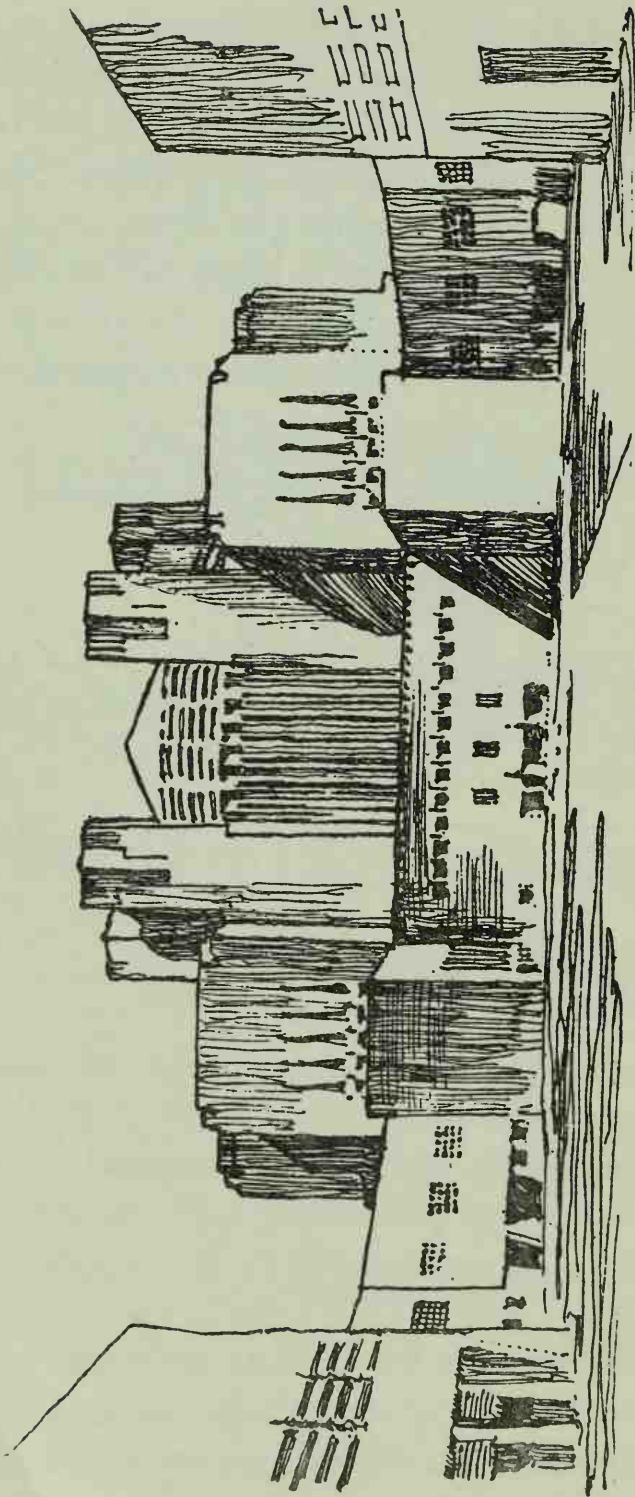


FIG. 62.
A design, by a student of the Dutch Reijks Academy, for a People's Hall. Severity almost unrelieved, showing tendency to 'dehumanize' architecture.

not 'working,' as it were, but is being supported. In Fig. 59 we have functional columns supporting an arch, and adjoining them columns which have a slight buttressing effect, but which are chiefly valuable in their negative or decorative capacity. These, like the forms applied to the stern of the magnificent vessel shown in Fig. 60, are negative elements which accompany the positive structure, and their utility lies in the decorative accompaniment, the emphasis, the softening of stern rigidity, which they provide. They are merely obeying the law of the necessity for contrast in design.

The desire which is universally felt for this contrast of positive and negative is sufficient to explain the retention—already alluded to—in architectural design of elements which answer no structural requirement and which are, in addition, often illogical. To condemn such features as 'meaningless' reveals, therefore, a certain lack of understanding. The dissatisfaction which is often felt by critics of the ultra-modern school of design, which is tending to produce effect by the manipulation of form alone, results in part from an unfulfilled desire for the presence of the so-called 'useless' or negative features which provide the relief from the strain of continuously positive expression. The rigid and uncompromising lines of the Dutch design shown in Fig. 62 would have been at once emphasized and relieved by a more generous introduction of playful and decorative forms or patterns. Buildings almost entirely positive in character have the defect of their quality; they are apt to be over-insistent, and to crush instead of to please the beholder by their too dynamic intensity of expression. An opposite, but equally unsatisfactory effect, results from an over-emphasized 'negativity.'

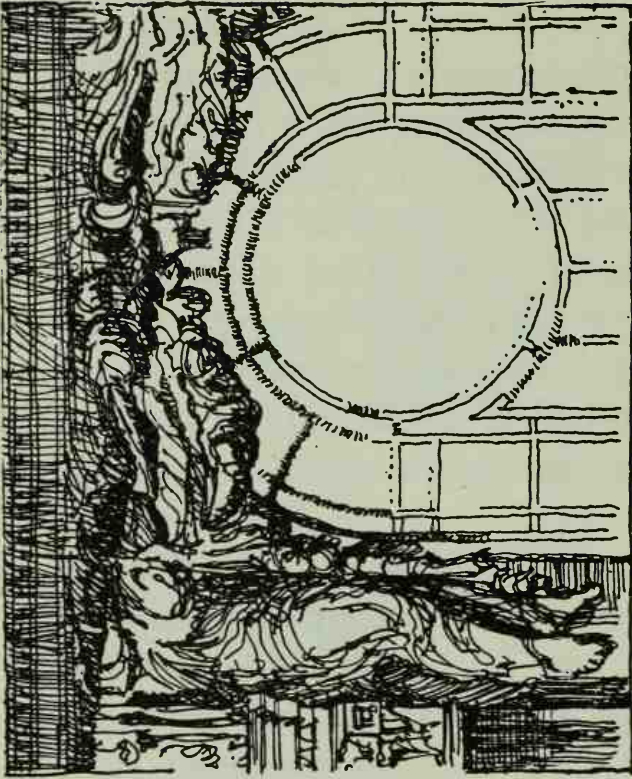


FIG. 64.—Window at the Wesleyan Hall, Westminster; Lancaster and Rickards, architects. Sketch after the architects' drawing for sculpture over window to main front. 'Negative' masses tending to obscure 'positive' function.

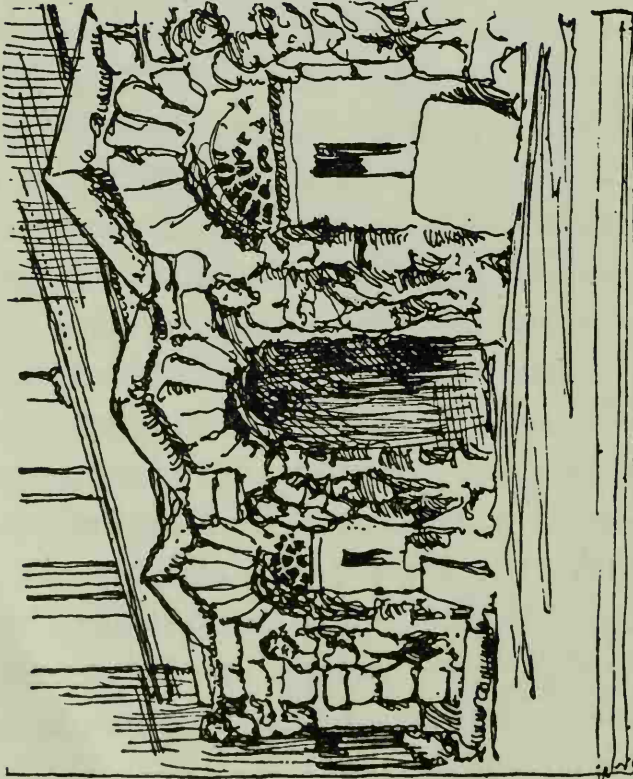


FIG. 63.—The 'Grotto of the Pines,' Fontainebleau. Human figures semi-conventionalized and used as a decorative motive. Structure here does not depend on their presence as is the case with the Caryatid Porch of the Erechtheion.

Architectural ornament is full of the same kind of contrast, and the relief of positive by negative gives it the life and sparkle which prevent 'deadness' and lack of interest. The distaste which we feel nowadays for much applied ornament results from its poor design, apart from the fatigue engendered by mechanical craftsmanship and detail which is faultily reminiscent; but good ornament is of immense value, not only as a means of expressing character, but in its enhancement of structural form.

In every period of architecture negative elements are seen to be employed in a more or less bold manner as an accompaniment to functional details, good examples being found in Gothic work, where figures, foliage, crockets, and devices of every kind are used to obtain an effect of extraordinary brilliance. It is, however, when an attempt is made by the designer to coerce a negative element into a positive function that dissatisfaction ensues. The use of rich masses of carving in a structural position tends to produce a sense of discomfort, however cleverly handled the treatment may be. Such an instance occurs in the arched window-head of the Wesleyan Hall (Fig. 64), where the structure of the arch voussoirs is lost in the decoration. The dislike which some architects may feel, in spite of hallowed precept, for the motive of the Eretheion caryatid porch (Fig. 87), results from the use of a decorative and negative figure as a structural and positive unit. The 'crime' is accentuated by the tendency to realism in the handling of the figures; conventionalizing of the forms would have resulted in an increase of the purely architectural character. The figures of the Grotto at Fontainebleau (Fig. 63) are merely a decorative adjunct; they are performing no real functional work. The caryatides of Jean Goujon at the Louvre merely

accompany the functional wall, and the stability of the structure would be unaffected by their absence. But the design of the Eretheion porch cannot be wholeheartedly approved except for the charm of its execution, and its value as a piece of possibly whimsical fancy in a generally austere composition.

The architect may readily accustom himself to detect in design the presence of positive and negative elements, and he may then use his knowledge of their proper function to enhance the effect, in original composition, of the broader and more general lines of his scheme.

As a corollary to the principles enunciated in regard to suitable use of the positive and negative elements, we have a further principle which we may term that of 'accentuation.'

Emphasis or accent in the elements of a composition is used primarily to enhance the effect aimed at in the general grouping, and accentuation properly comes under the general heading of contrast, since accent provides an interruption or contrast to monotony. Accentuation is a resource of the designer in obtaining strength of effect, and in underlining, as it were, certain phrases in his architectural essay, thus calling attention to the ideas or features which in his opinion should be salient. Emphasis, while not necessarily strong, should always be definite, or weakness in expression of the idea will result.

Emphasis may be obtained in a variety of ways, by sheer mass and bulk, by concentration of richness of decoration, by strength of colour or tone, by interest of line, or by the subtler process of suggestion or inference. It is only with this latter case that it is necessary to deal, since for the former no particular knowledge is required other than an

understanding of proportion in mass, line, and colour, coupled with an observance of the principles of contrast, and with these we have already dealt.

In order to obtain accentuation of any element without direct emphasis of the element itself, it is necessary that the eye should be unconsciously but unhesitatingly led in the direction of the element, so that a centre of attraction is created to which, as it were, all avenues tend to direct the vision of the spectator. Such a result is equivalent to the preparation and the ultimate achievement of an architectural climax (Figs. 65 and 67).

There are numerous methods of obtaining this result, and they constitute examples of the refinements of architectural design. It is only useful to cite one or two examples, for the architect will find the means at his disposal to be infinite and varied.

A simple example of emphasis indirectly obtained is that of employment of converging lines, sometimes called 'radiation.' We must assume the fact that lines converging from all directions upon a given point lead the eye towards this focus and emphatically establish its position, particularly if the lines are accentuated in strength in the sense of the desired direction.

An excellent example of the employment of converging lines as an aid to emphasis is provided by Leonardo da Vinci's painting of 'The Last Supper' (Fig. 61), where the ceiling lines in the architectural background are made to converge upon the central figure of the Christ, which is thus subtly emphasized as a focal point, independently of the other devices employed in the composition, such as colouring, the grouping of the figures, etc. An architectural example of the same character occurs in the

converging lines in a recessed opening (Fig. 66), though in one case the lines are radial and in the other concentric.

A simpler and more direct instance of accentuation applied to a doorway occurs in the arrangement of a flight of steps which not only guide the eye, but actually lead the

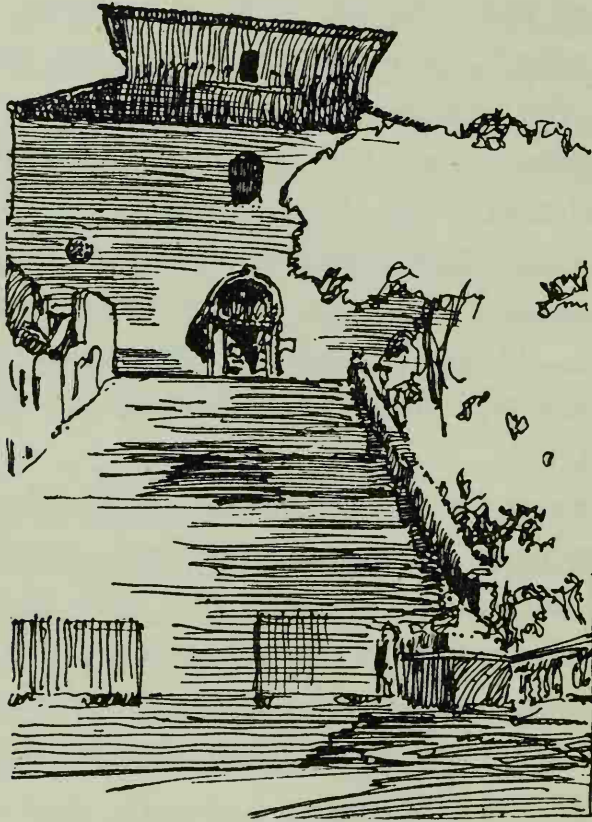


FIG. 65.

The Church of Santa Maria Araceli, Rome.
Accentuation of the doorway.

spectator. An effect of converging lines may be introduced as an additional emphasis, as is the case with the diminishing central staircase in the remarkable reconstitution at the 1922 Marseilles Exhibition of the Temple of Angkor Vat (Fig. 67).

The process of accentuation of any feature entails on the

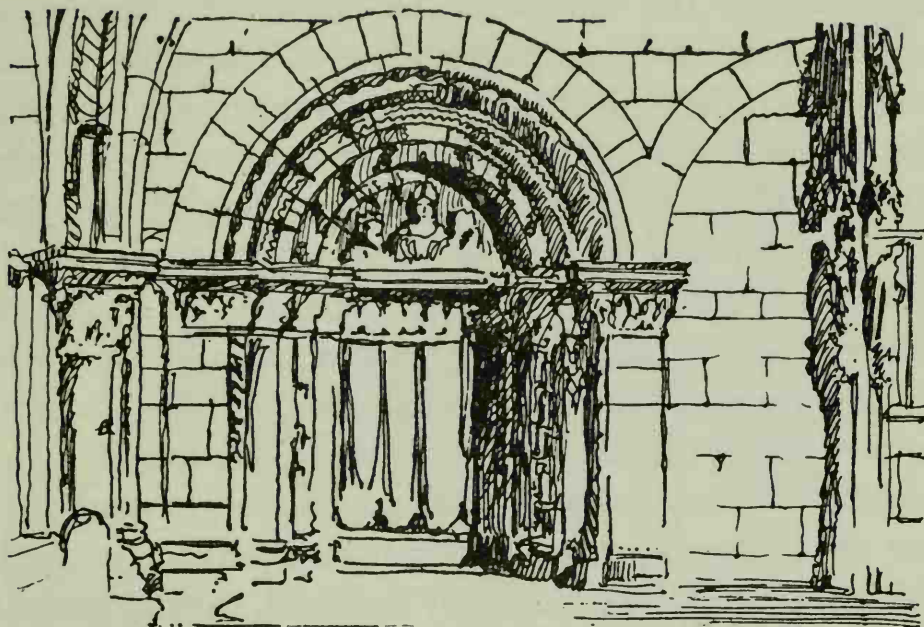


FIG. 66.—The Dom Kirche, Mayence. Concentration by radiating pattern. The arrows show the direction of the general concentration on to the sculpture of the over-door lunette.

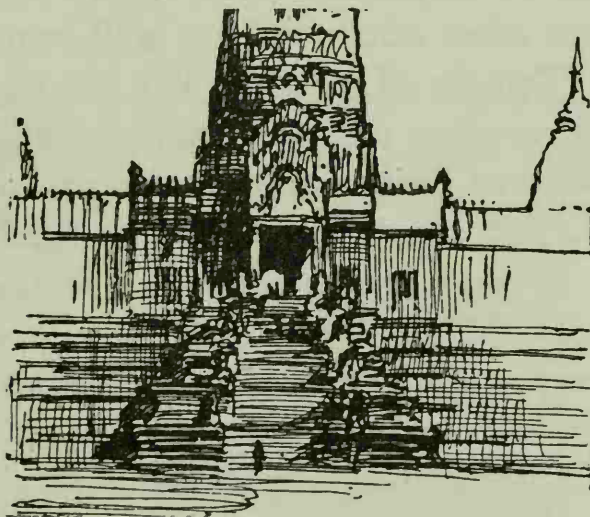


FIG. 67.—Central doorway of the Temple of Angkor Vat as reconstituted at the 1922 Colonial Exhibition at Marseilles. An effect of climax heightened by receding planes, and perspective accentuated by repetition of motives diminishing in size.

designer's part the obligation to design the feature in a manner worthy of the emphasis given. Too often we find a splendid arrangement of motives converging on a centre in which is found, not a brilliant spot of fine carving or colour, but some relatively plain diamond or circle shape, totally unworthy, through lack of interest, of its focal position; or perhaps a whole area of plain wall will be arranged to accentuate by contrast a piece of concentrated decoration, or a richly framed void, and yet the design of this decoration or void treatment is too often trite and ill-conceived.

Another method of accentuating climax consists in the device of arranging the accompanying effects in such a way that the climax is continually deferred, thus heightening by expectation the emotions of the spectator. Instances of this occur in the introduction of receding planes and masses, or the preparation of small climaxes or points of interest serving to emphasize more surely the main focus. Such effects are often obtained by a well-conceived repetition. In the Temple of Angkor Vat we have numerous horizontal and receding planes, a staircase where repetition occurs in the carved dragons diminishing in size as do the steps in width, and the placing of the central doorway in such a way as to heighten the effect by a feeling of remoteness, almost of difficulty of attainment. A climax more obvious and easy would certainly have been less powerful.

The dome of St. Paul's Cathedral is a magnificent climax in itself, but it is intensified by subsidiary climaxes such as those formed by the portico and the flanking towers. These detain the spectator's eye and defer the main climax, which ultimately gains by its clear dominance over those presented by the subsidiary features.

In discussing the principle of accentuation we border

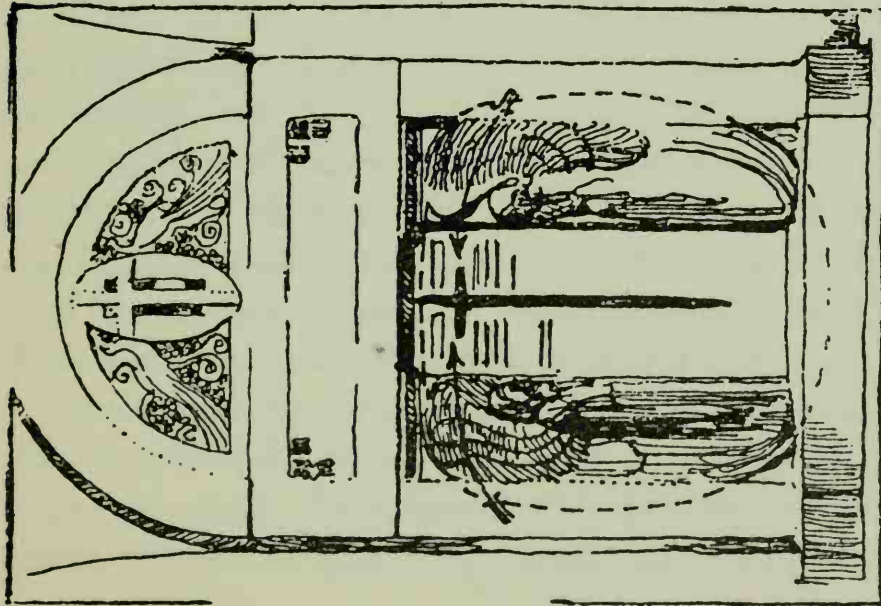
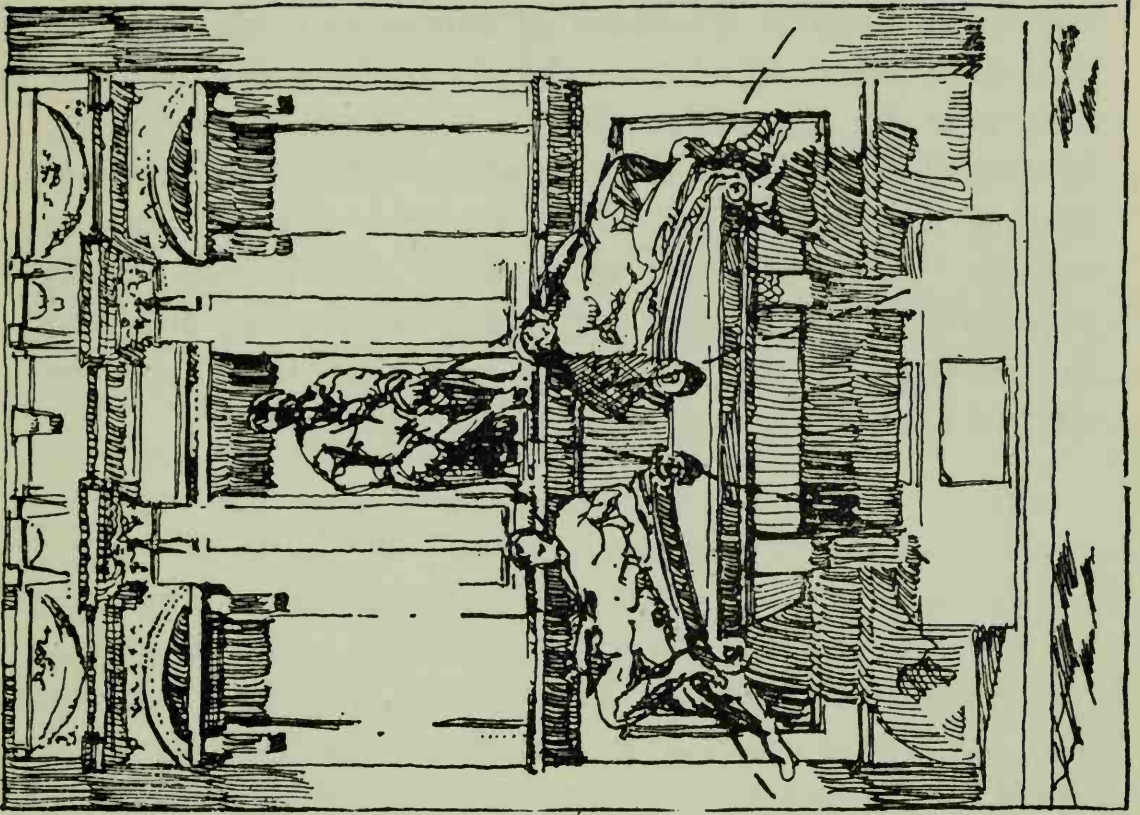


FIG. 68.—Monument to the Dead in the French Seminary in Rome, by Roux-Spitz and Delamarre. The wings of the figures and the flow of the drapery are subtly used to focus the interest towards the central name tablet.

FIG. 69.—Tomb of Lorenzo di Medici, in the Sacristy of San Lorenzo, Florence. The dotted lines show how the composition is arranged to guide the eye towards the focus of the central figure.

closely on abstract questions of expression; we begin to deal with effects which are related closely to the desire or otherwise for dramatic effect. We must consequently beware of any attempt to force effects without full realization of the atmosphere which we wish our building to convey. It is sufficient to mention that certain effects produced in architecture are largely analysable, and that in consequence the means for obtaining them may be studied with profit, and, when mastered, employed.

The Expression of Character in Design

IN the preceding chapters we have dealt in a general way with some of the main principles of composition; we have laid down that certain qualities must be present, and we have suggested how they may be introduced. We have not, however, dealt with the expression of character in design, nor with what one may well term the 'physiognomy' of buildings. Most architects will have remarked that many buildings which they have noted as reaching a certain standard of design, convey a definite impression, not only of function, but also of something equivalent to human expression. Some façades give an impression of blankness or baldness, others appear to frown, while others appear debonair and gay; yet another type will be friendly but austere.

These effects of expression are due not only to a choice and handling of materials, the presence or otherwise of ornament, but in the main to the general proportioning and shaping of the elements in the composition. It is in the treatment of these elements that the designer has exteriorized his personal conception of what the building should be, and he has thus endowed it with character, the expression of which it remains for the critic to comprehend and to classify.

It is when we come to consider character that we realize the danger of adhering to rules or principles without understanding their limitations, and become aware that the artist rejoices in mastering rules, but not in allowing rules to master him.

We have spoken, for instance, of the necessity for contrast in composition, and the tendency of the eye to be pleased by diversity rather than by monotony. It may conceivably happen, however, that the noblest and most potent expression of an edifice may be obtained by the production of an effect of complete monotony. Such a monotony, however, which is absolute, is, in reality, less a monotony

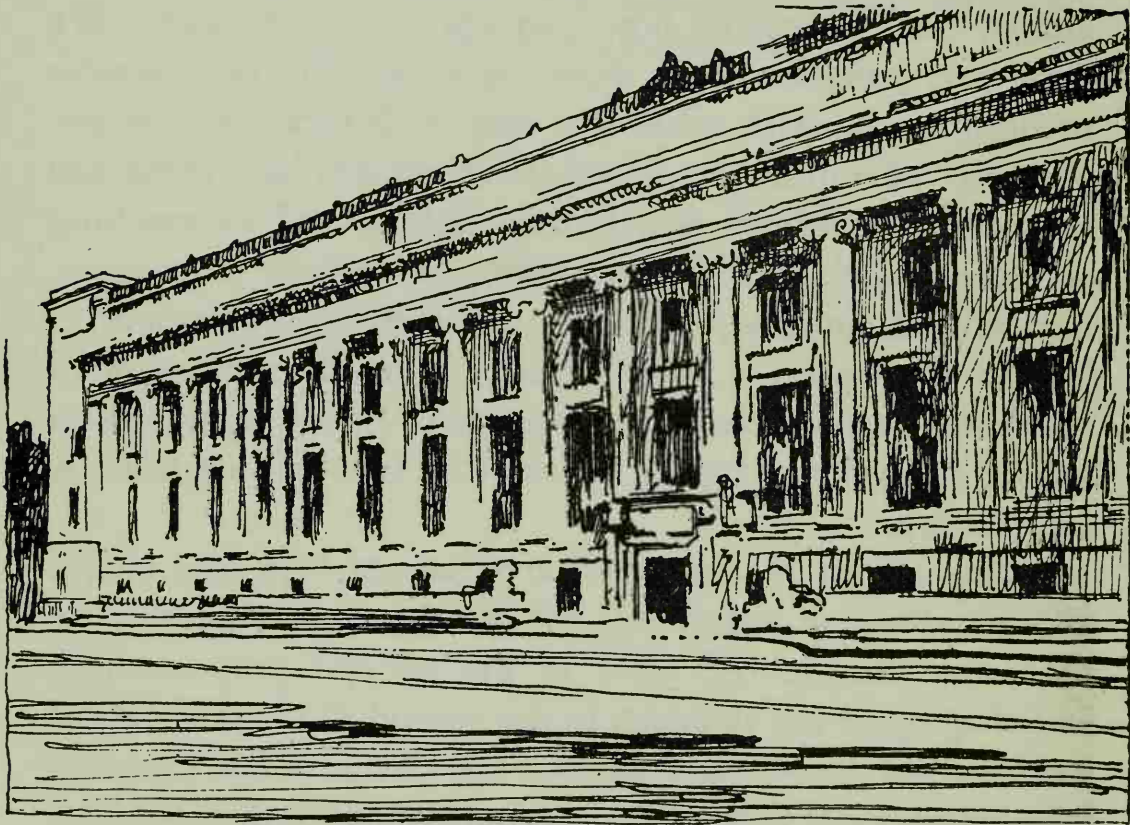


FIG. 70.—The British Museum Extension. Sir John Burnet, A.R.A. Repetition of motives producing, not monotony, but a strong emphasis of unity.

than a particularly strong expression of unity (Fig. 70). The very lack of small interests, the feeling of power engendered by the realization of one central dominant idea, produces an effect neglecting, perhaps, the element of 'delight,' but urgently insistent as regards 'firmness.' One may well imagine a huge and perfectly blank concrete

wall, or the more familiar spectacle of the endless arcades of a Roman aqueduct, and then recognize that unity and strength are the dominant expression (largely due, in both cases, to continuity of treatment), but that no feeling of monotony is present. We may then go further, and find that the effects of continuity are themselves largely bound up with the effect of contrast between this continuous unity and surroundings whose characteristics are not of the same order.

In pursuing the study of 'character' it is open to the designer to analyse existing buildings and experiment with his masses and proportions, repetition of elements, etc., so as to be cognizant of the preliminary steps necessary for the production of certain effects.

All students are familiar with that expression of stable serenity, which is so characteristic of the best Italian Renaissance palaces, arising in part from the proportion of the large reposeful wall spaces above the windows. It is an effect which climate and other reasons almost preclude in English work, though occasionally we find the opportunity seized, as in Messrs. Thos. Worthington and Sons' design for the Manchester Masonic Temple (Fig. 72), where window lighting to certain attic rooms was not required. Another instance of the introduction of certain proportions to obtain definite character occurs in the pronounced verticality of window-openings, which often produces an effect of elegance and grace, and if exaggerated may develop into an expression of austerity and aspiration. Amongst many instances of the first kind we may cite the proportions characteristic of Late Georgian work, and of the second, the frequent use of tall windows in church work (Fig. 75). The 'Five Sisters' of York Minster (Fig. 73), for instance,

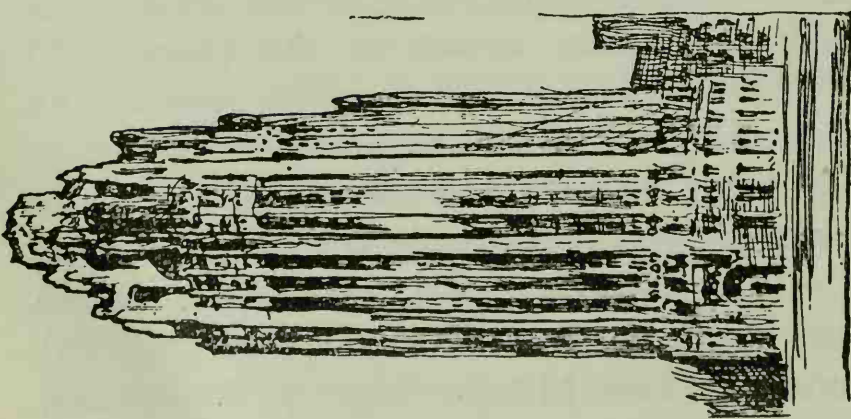


FIG. 71.—Winning design by Howells and Hood for the *Chicago Tribune* building. Pronounced verticality eliminating necessity for wide and solid corner piers.

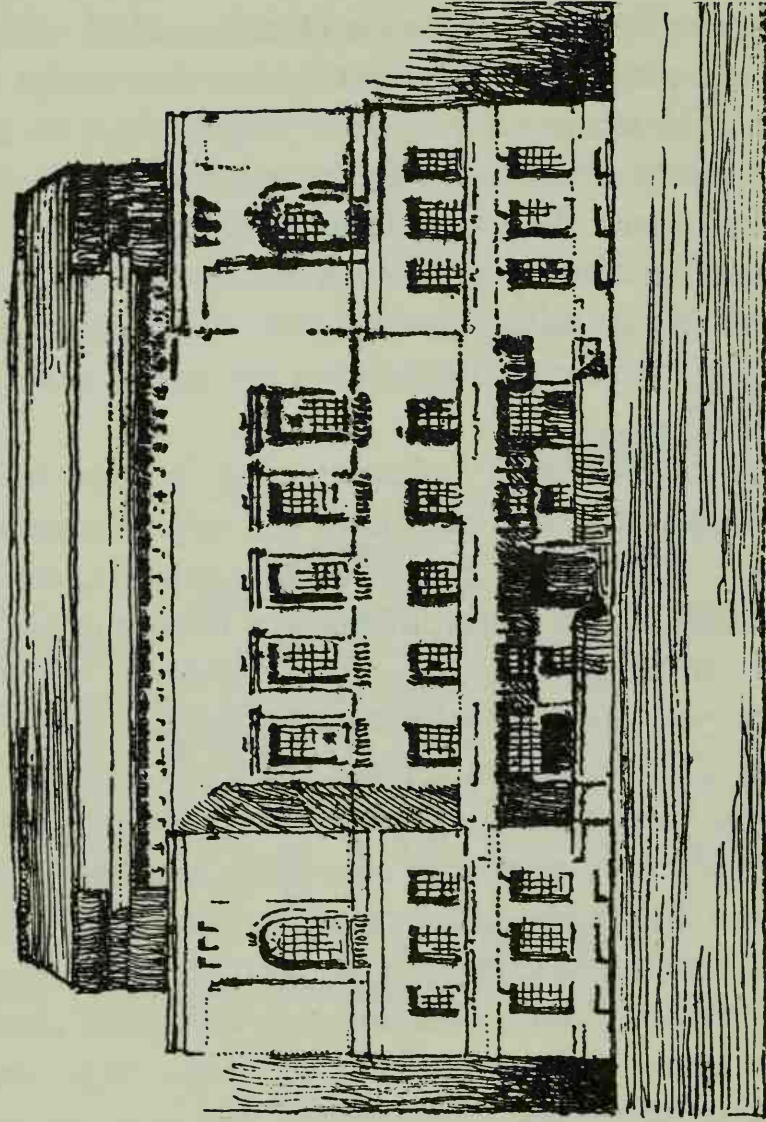


FIG. 72.
Premiated design, by Thomas Worthington and Sons, for the East Lancashire Masonic Hall competition, Manchester. Dignity and repose through ample wall surfaces crowning the scheme of fenestration.

produce a mental impression quite different from that of a broader and more florid Decorated window. The departure from any proportion which is usually associated with utilitarian purposes, is at once noticed and appreciated by the trained eye. That is one reason why we rarely find the usual domestic window proportions used in monumental buildings. Our feelings demand a nobler and more characteristic expression.

A character of breadth and repose in a horizontally disposed design may be accentuated by a stressing of horizontal divisions, cornices, string-courses, etc., and by a judicious repetition of motives (Figs. 70 and 76), for repetition invites the conclusion that space is available, since otherwise we could not see the same motive occurring several times. The clever designer will not, therefore, if an effect of breadth is desired in a limited front, break up his elevations into different motives, for the fact that he has not much space available will be immediately revealed by the obvious impossibility of extensive repetition of any one of them. Repetition produces a certain rhythmic effect, in itself a valuable characteristic, but with this we will deal later. In Fig. 74 we see an impression of easy strength conveyed by simple motives largely handled, without any attempt to crowd the limited front available.

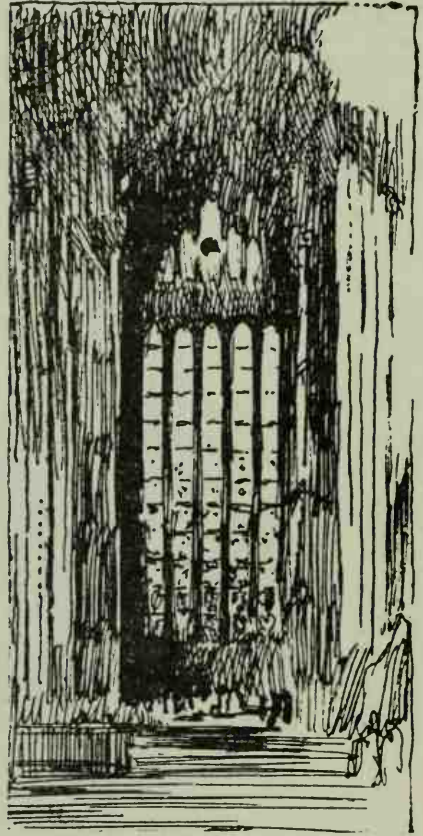


FIG. 73.—The 'Five Sisters,' York Minster. Character of austerity and aspiration conveyed by great height and simplicity of expression.

In vertical structures an expression of strength is most obviously secured by the architect through a thickening of the corner masses, which the eye perceives as a solid containing margin forming a frame to a pattern of solids and voids. Another designer, however, will subtly accentuate his character of verticality and obtain such an expression of soaring movement that the eye will never rest at the angles nor demand their reinforcement, but will be impelled always upwards to the building's climax. An

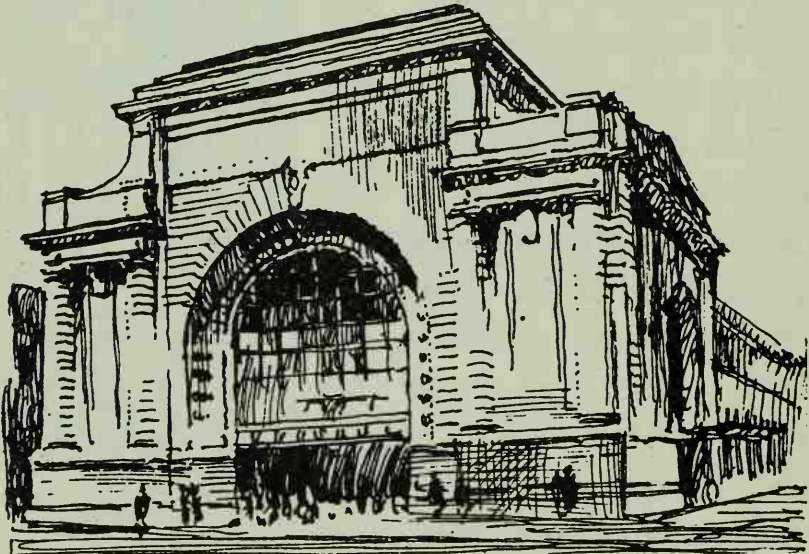


FIG. 74.—Station of the New Orleans Terminal Company, D. H. Burnham and Co., architects. The ample effect of one large simple motive on a comparatively restricted frontage.

example of this expression of the character of verticality occurs in the Woolworth building in New York, as also in the winning design by Messrs. Howells and Hood for the *Chicago Tribune* building (Fig. 71).

It is, of course, obvious that proportion of form in architecture cannot be considered uniquely as a contrast of shapes which on paper produce merely an effect of pattern. The elements of architecture being three-dimensional, it is necessary to visualize depth as well as length and breadth. This

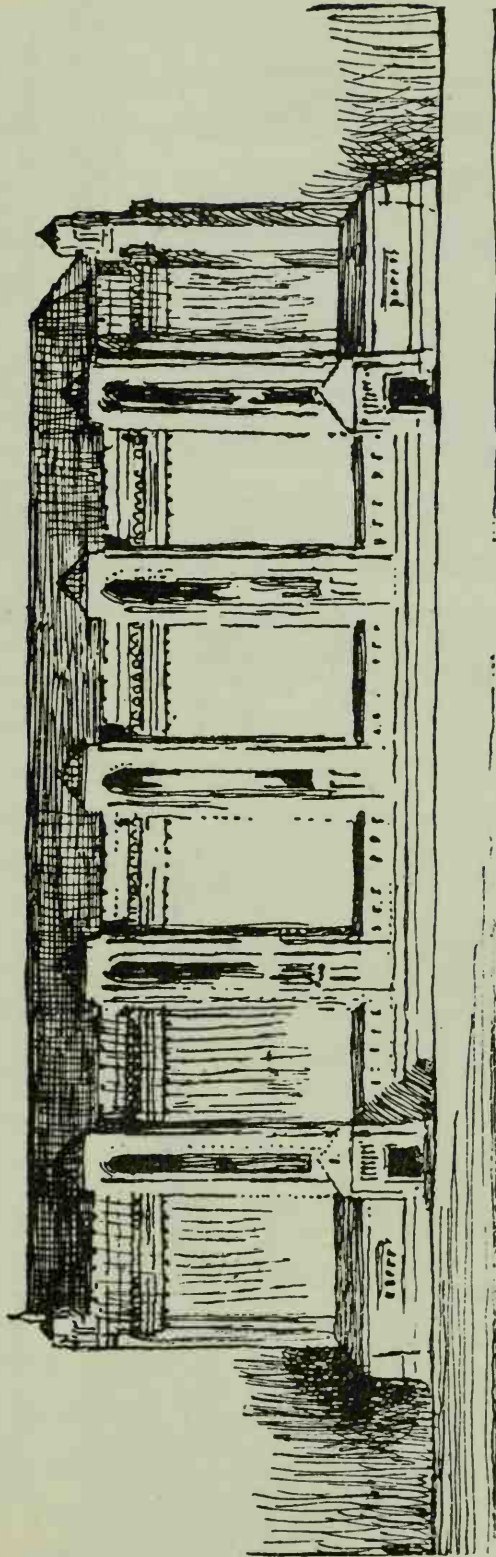
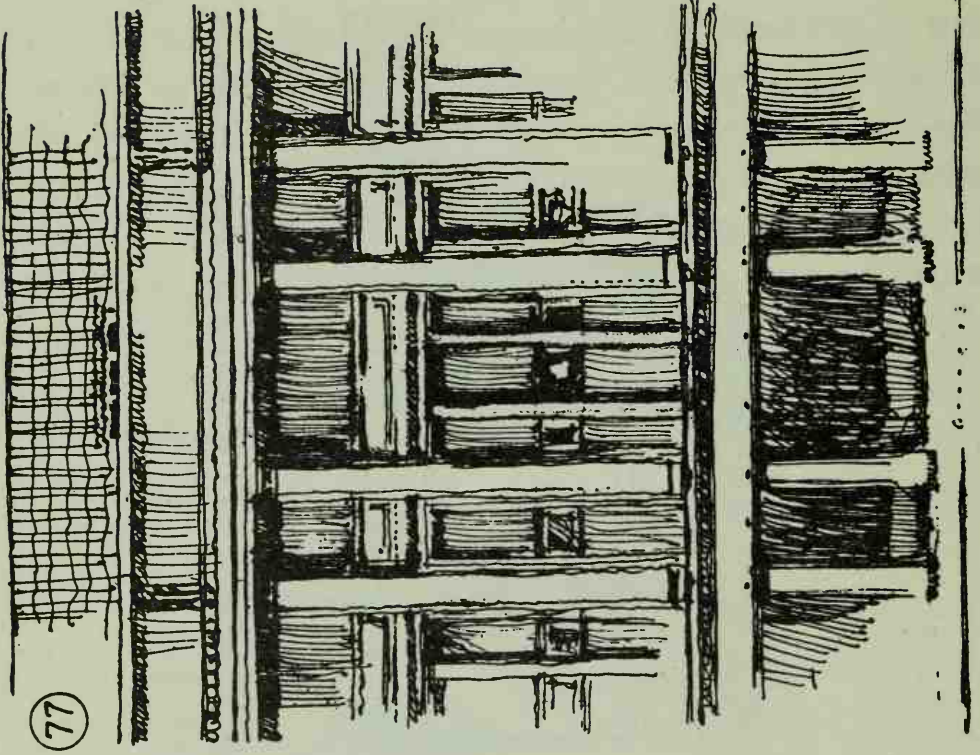


FIG. 75.

War Memorial Chapel for Charterhouse School by Sir Gilbert Scott, R.A. A further example of verticality as an expression of character.



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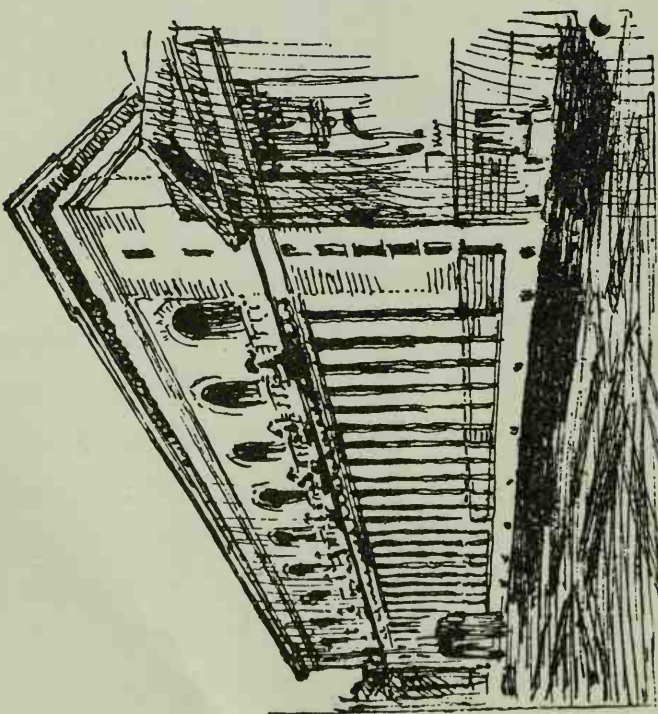


FIG. 76.

The stack room of the New York Public Library, by Carrère and Hastings. Definite proportions in fenestration as an expression of function.

FIG. 77.

Messrs. Heal's shop in Tottenham Court Road, London. Effective handling of shadow through varying depths of reveals.

question has already been touched upon in dealing with form and with the importance of contrast of proportion in projections; the designer is called upon to visualize, through perspective or the casting of shadows upon his geometrical elevations, the effect which is produced by depth of reveal and projection, as the proportions adopted will vitally affect not only the purely plastic result, but also the more abstract question of character conveyed.

Strong projections may produce an effect of vigour and force, an expression almost comparable to a frown on the human countenance. Exaggeration, however, may result in the opposite extreme, the weak and futile sensation produced by the puny masquerading as the strong. Good examples of the former type occur in Italian Renaissance palaces, such as the Farnese Palace, already illustrated, while the American 'skyscraper' of the early commercialized form provides, with its top-heavy and ill-attached cornice, a regrettable instance of the second category (Fig. 78).

The reveals of window-openings play a most important part in producing an effect of character. The placing of frames and sashes flush with the outside face of the wall, as is often seen in so-called 'Queen Anne' houses, results, in small-scale buildings, in a quiet and pleasant unity of effect. The same device, however, applied in a building of more heroic proportions, might well develop a character of weakness. The effect may be judged in the show-windows of big stores, where the placing of the glazing close to the outer edge of the piers supporting the more solid structure above, a very practical arrangement from the shopkeeper's point of view, often results in an effect of thinning the pier and suggesting supporting action by the

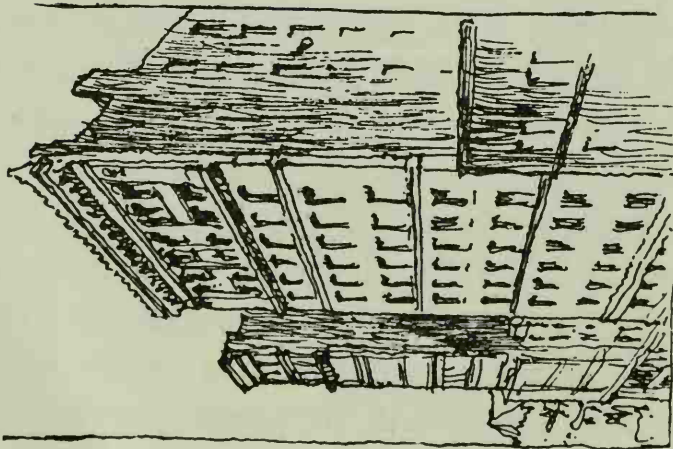


FIG. 78.—Office buildings in New York. Heavy and ill-attached cornices, relic of the Italian Renaissance influence, but in this case superfluous and weak.

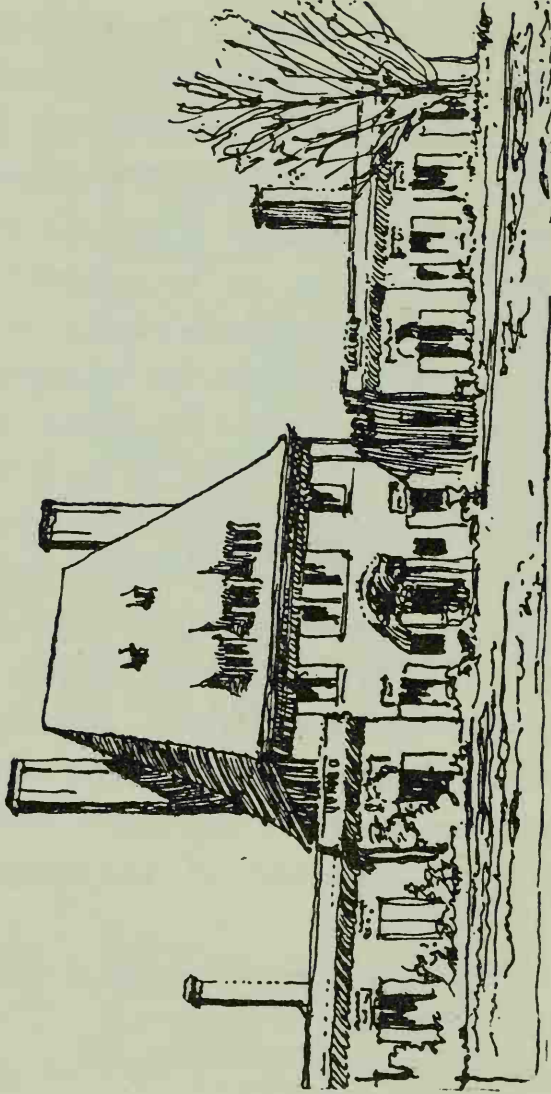


FIG. 79.

House at Greenlawn, Long Island, U.S.A., by John Russell Pope. The high roof as an aid to expression of character.

sheet of glass. The pier may be full of ample depth, but the fact remains that the glass line appears to cut it into two parts, an effect heightened by the different treatment and colouring generally applied to that portion of the pier which is behind the glass, and which has, therefore, to be

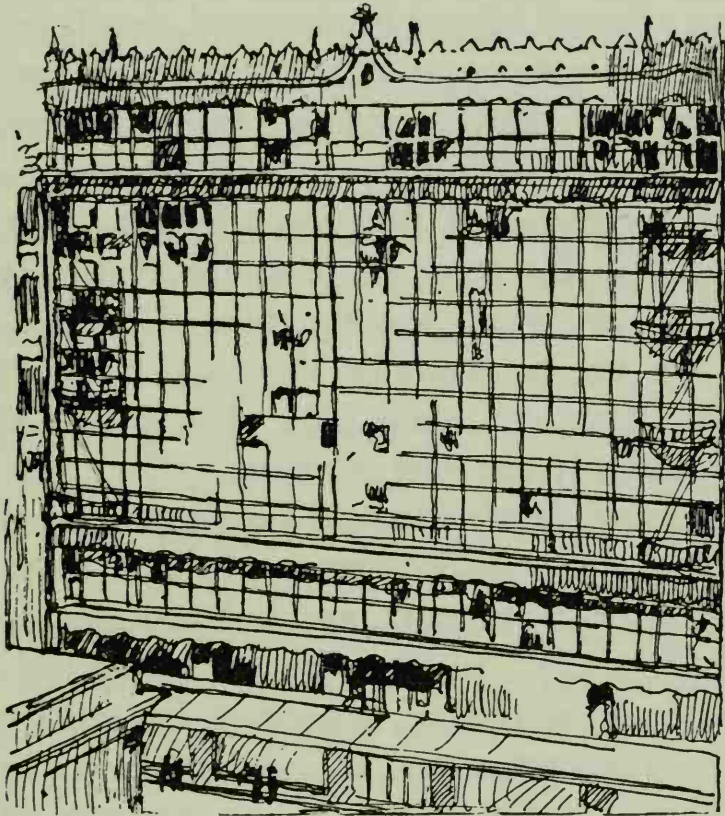


FIG. 80.—A San Francisco shop-front, the façade of which is almost entirely in glass.

considered as part of the decorative scheme of the show-window.

A particularly clever handling of window reveals is afforded by Messrs. Heal's shop in Tottenham Court Road (Fig. 77). Here we have a suggestion of hospitable and friendly character in the recessed show-windows of the ground storey, an intermediate stage suggesting interest

and entertainment without undue emphasis, while on the top storey the character of strength appropriate to a building of this size is introduced by the depth of the window reveals suggesting a sturdy thickness of walls and perfect stability.

The proportion of solid to void, and the exaggeration of one or the other, may, in addition to producing what we may call an abstract appeal to the mind, result in a definite expression of function, and it is here that we encroach upon a different theme, namely, the expression of the building's purpose. We may instance, however, in passing, the strong suggestion of function afforded by the narrow vertical lights in the stack room of the New York Public Library (Fig. 76), while the function of display is clearly expressed by the tremendous development of void over solid in the American shop (Fig. 80), where the façade becomes practically one vast window.

As a last example of character suggested by emphasis of proportion we may cite the immensely high roofs found in some of the French châteaux, and in buildings reproducing their type (Fig. 79). In these high roofs we feel a suggestion of pride and arrogance, a note of domesticity sounded in an ultra-aristocratic key. These roofs constitute certainly a shelter, but they are also an evidence of the will and power to display. Their space is but little utilized internally, they are neither economical nor utilitarian, but no one will deny that they add a vigorous hall-mark of character to the buildings which they adorn.

VII

Proportions in Detail

OF proportion in the various smaller architectural elements of a building we may say that exactly the same principles hold good as for the general massing, and the same desiderata are to be aimed at. Difficulties which arise in the main grouping are, however, encountered in a more insidious form when we come to the details of design, for here we are obliged to be extremely precise, and the obtaining of correct proportions requires in addition an architectural vocabulary, a knowledge of what are called 'motifs,' of great range and flexibility. To the student of composition it is probable that greater obstacles will be met with in the design of a single monumental doorway than in the massing of a large block of buildings. The latter constitutes a broad general essay in form, the former requires definition, precision, and a very practised knowledge of effect. The design of a simple arched or rectangular opening may be fairly easily encompassed, but the introduction of mouldings, cornices, brackets, pilasters, etc., the familiar classical accompaniment, demands an acquaintance with the correct proportions of these details. They have been so tried and tested throughout different great historical periods that their proportions in any style have become almost stereotyped, with the result that errors in their setting-out are readily detected. To design such details in a fresh and modern way demands not only a knowledge of classical handling of the same problem, but a great deal of creative imagination besides.

The fact that certain proportions have been found so generally satisfactory and acceptable has naturally raised the question of the method by which they have been arrived at, and opens up the controversial subject of proportion ratios and their relation to the science of geometry and mathematics generally.

It is held by many persons that there is a definite arithmetic of beauty, and that it should be possible to discover some relationship of mathematical values, some curves or geometrical forms, through the use of which it would be feasible to synthesize beauty with mathematical accuracy.

Other theorists have held that there is an arithmetic or geometry of beauty based on number, or on forms which have a religious or mystical significance, and there is no doubt that in support of all these theories there occur some very curious phenomena or coincidences which lend weight to their claims for consideration. It is outside our scope to treat of this question in detail, but the subject is one which has a bearing on any attempt to lay down guiding principles in proportion. It has been ascertained that certain well-known buildings or ornaments, of undisputed architectural beauty, bear in the setting-out of their proportions an evident relationship to geometrical figures, such as, for example, the square, the circle, the equilateral triangle, or the parabola. The cardinal points of their contours or silhouette are found to be contained within such figures, or the perimeter of the figures coincides with certain focal points of the design. Amongst the examples illustrated (Figs. 81-87, 94, 96) are those used by M. François Benoît and Mr. Claude Bragdon in treating of this subject, and they are typical of a large number of similar cases.

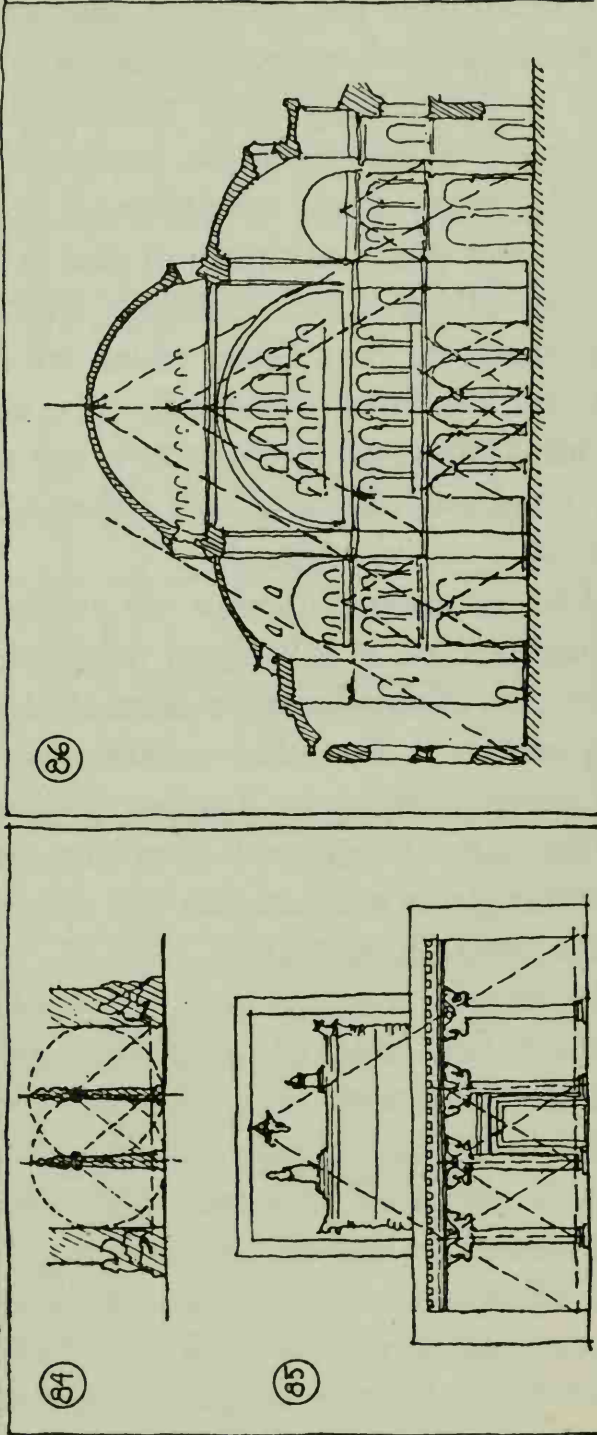
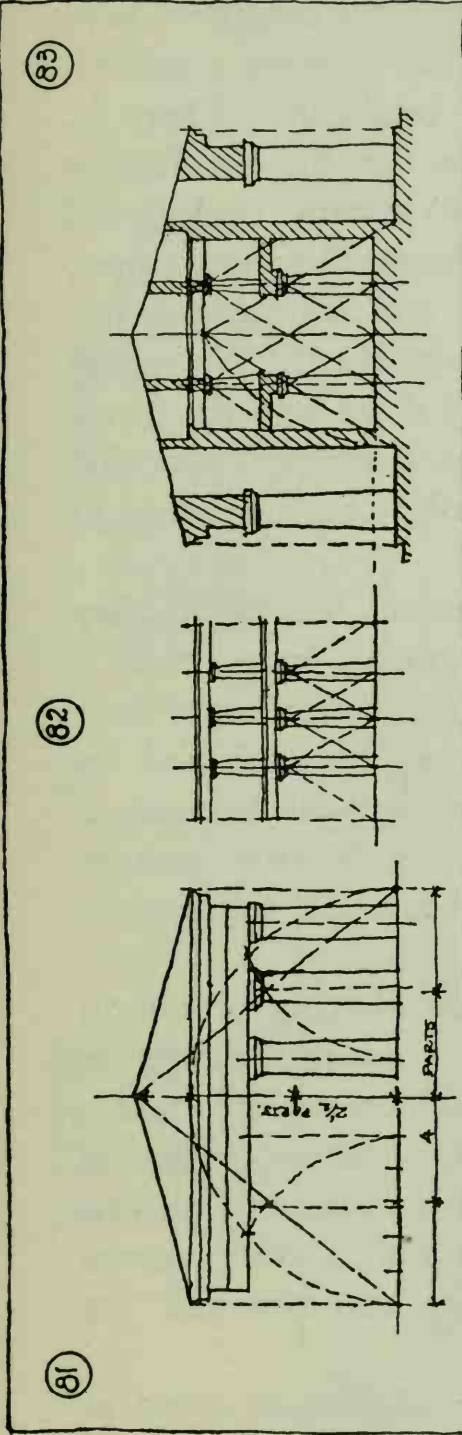


FIG. 81.—The presence of the triangle in Greek proportions. Façade of the Temple of Poseidon at Paestum (after Benoit).
 FIGS. 82 and 83.—Longitudinal and transverse sections of the same.
 FIGS. 84 and 85.—Geometrical proportions in Persian buildings. Gate of Honour of the Royal City of Persepolis, and façade of the Tomb of Darius (after Benoit).
 FIG. 86.—The presence also in Byzantine proportions of the equilateral triangle. Santa Sophia in Constantinople (after Benoit).

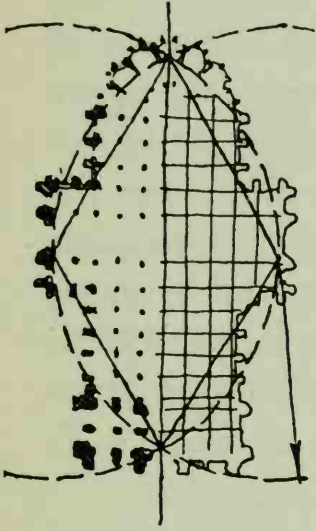
Certainly it has occurred that successful designers have worked on such a geometrical basis, but whether scientifically or empirically it is difficult to establish. There is, however, a fairly simple explanation for the satisfaction which arises from compliance with certain geometrical forms and relationships, and that is the stability and power, already alluded to, of shapes which are definite and unhesitating, such as those which we have cited. We recognize the qualities of these figures, and if we base the forms of our designs upon them, it is not too much to expect that the resultant building will enjoy similar characteristics, at least to a certain degree.

The successful design of an interior, the satisfactory setting-out of a pilastered wall treatment, may reveal a repetition of the Triangle form in the determination of their proportions. But this satisfaction may be explained by the rhythm set up by a series of dimensions all determined on the same basis, and does not necessarily arise because the triangle as a figure has any special mystical significance in the creation of beauty.

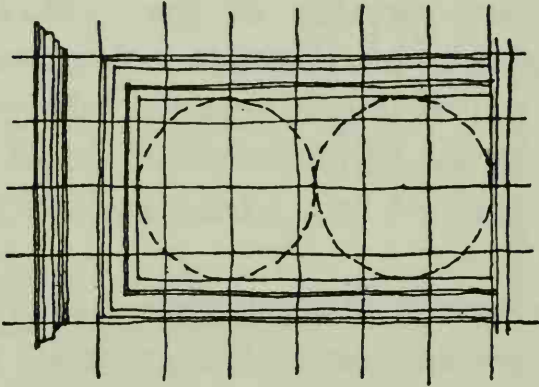
It may be asserted that the graphic plotting of certain mathematical calculations results in a beautiful curve, or that the silhouette of a building contained within a parabola will convey an effect combined of power and elegance. One is prepared to admit both claims, with the remark that there are in all probability a hundred other curves and silhouettes which may be equally beautiful and yet determined on a totally different basis.

To the influence on proportion of religious or mystical beliefs we can only allude in passing. It is an established fact that certain geometrical figures held a symbolic significance during past periods of the world's history as they do,

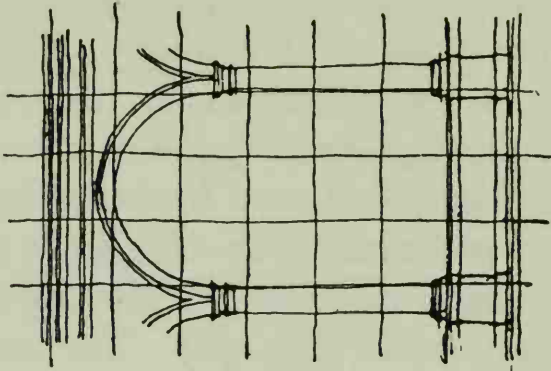
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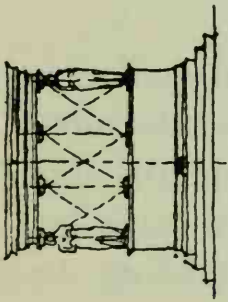
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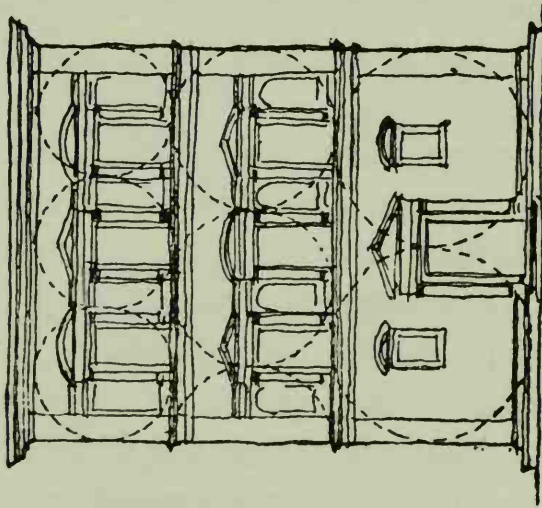


FIG. 87.—Triangular setting-out in the Caryatid Porch of the Erechtheion (after Benoit).
 FIG. 88.—The plan of Beauvais Cathedral and the relation of its proportions to the 'vesica piscis.'
 FIG. 89.—Geometrical proportions in the Palazzo Bartoloni in Florence. Note the diminishing ratios of the stories.
 FIGS. 90 and 91.—Geometrical relationships in details. Window and arcade from Italian palaces.

indeed, to-day, and that the use of these figures influenced the proportions of buildings. The 'vesica piscis,' for example, a figure formed by the developing arcs of two equilateral triangles having a common base (Fig. 93), may certainly have been used in the setting-out of the plans of mediæval cathedrals (Fig. 88), in the same way as the figure of the square occurs in the plotting of Norman or Italian Renaissance work (Fig. 98). The rectangle formed by the length and breadth of the 'vesica piscis' has peculiar properties, of interesting creative possibilities, and by using it as a unit it is held that the 'design of the largest building, with the minutest detail, could be drafted with absolute accuracy' (cf. *Science and the Infinite*, by Sydney T. Klein).

The interest of the theory of such a system of proportion lies in the undoubted truth that the use of a definite figure as a basis of proportion throughout the design results in the establishment of a certain harmonic relationship between all the elements so proportioned, due to the repetition of the figure, which becomes, as it were, the common denominator of the design.

We find ourselves at this point touching on the similarity between the structure of musical phrasing and architecture, inasmuch as both involve laws of harmony, intervals, and rhythm. An interesting study of this analogy is made by Claude Bragdon in *The Beautiful Necessity*, tending to show, amongst other points of resemblance, the presence in music of intervals which are more important or perfect than others, and which correspond numerically with ratios giving satisfactory proportions in architectural design. From the architect's point of view, the question resolves itself into assuming a definite unit of size and using this unit

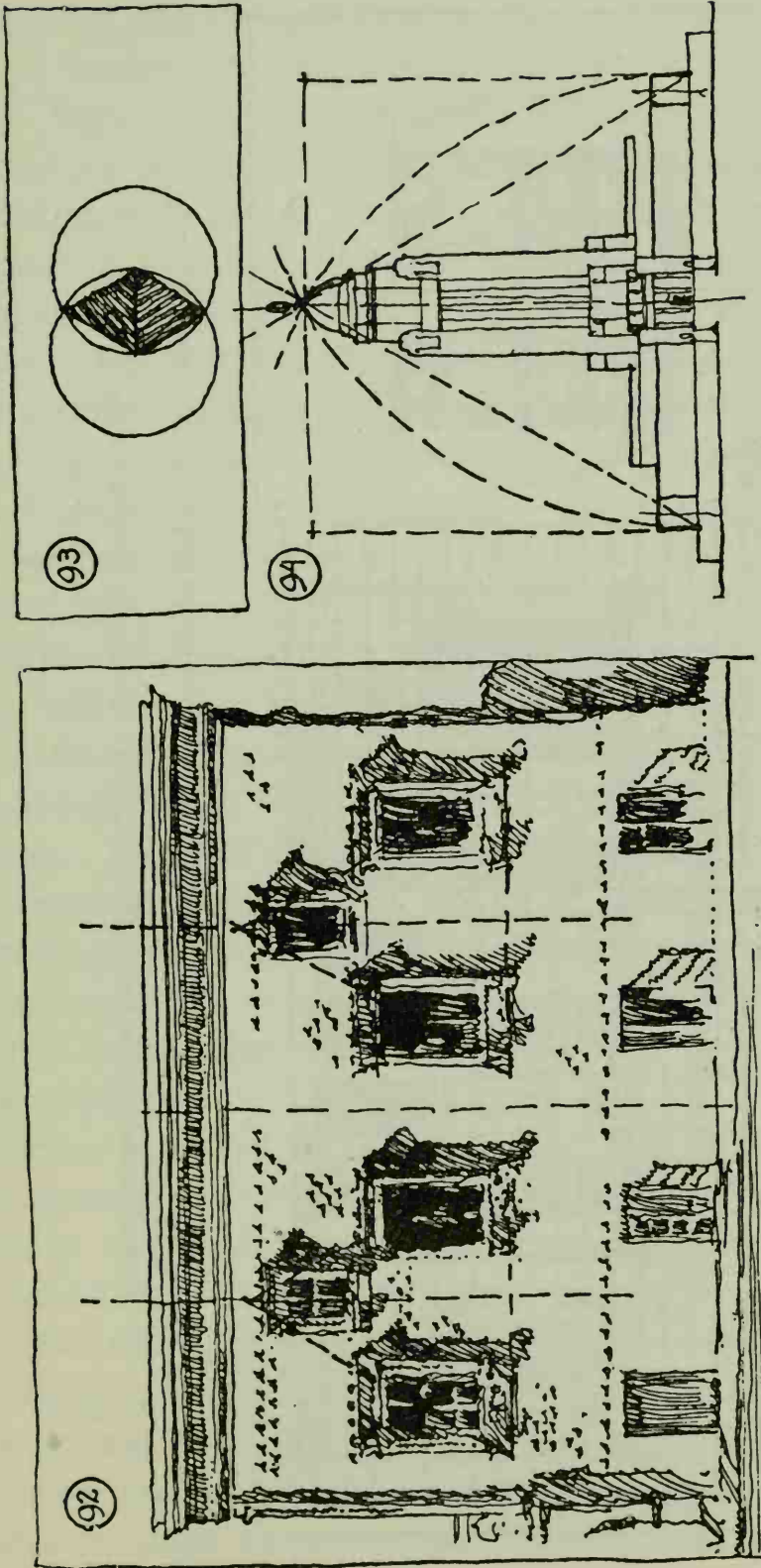


FIG. 92.—Misplaced triangulation resulting in the effect of creating a duality. The faceted palace in Moscow.
FIG. 93.—The formation of the 'vesica piscis.'
FIG. 94.—The equilateral triangle in modern work. Bertram Goodhue's Nebraska Capitol.

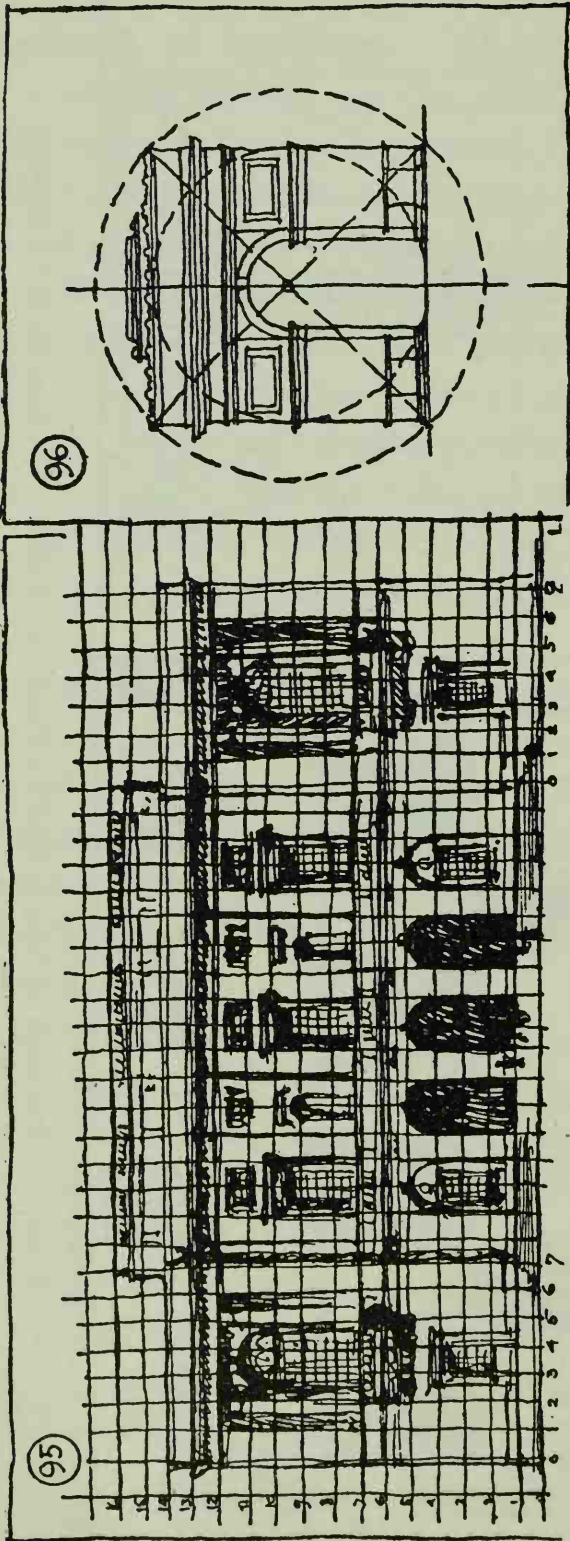
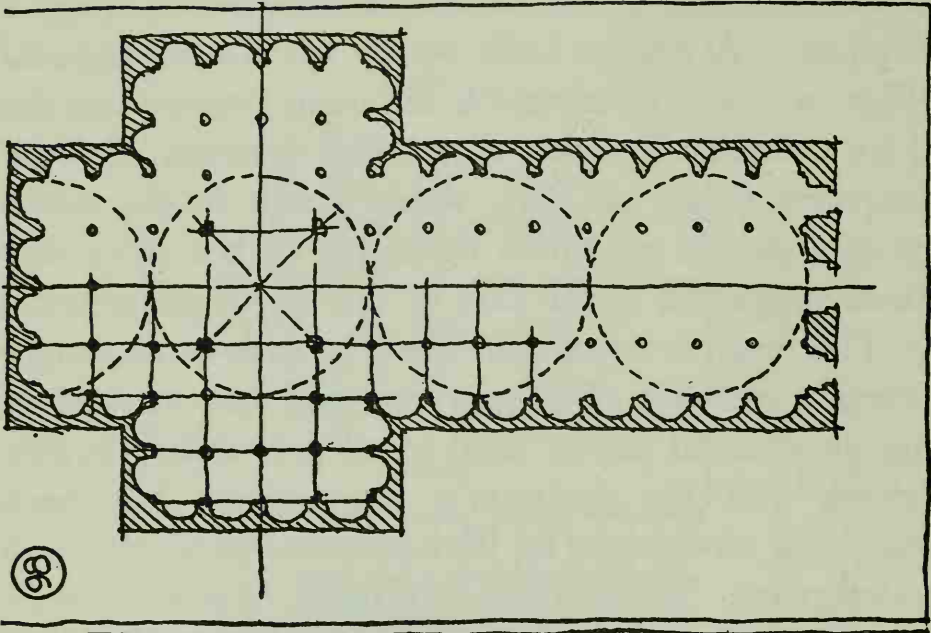


FIG. 95. Illustrating the use of squared paper in determining the general proportions of an elevation.

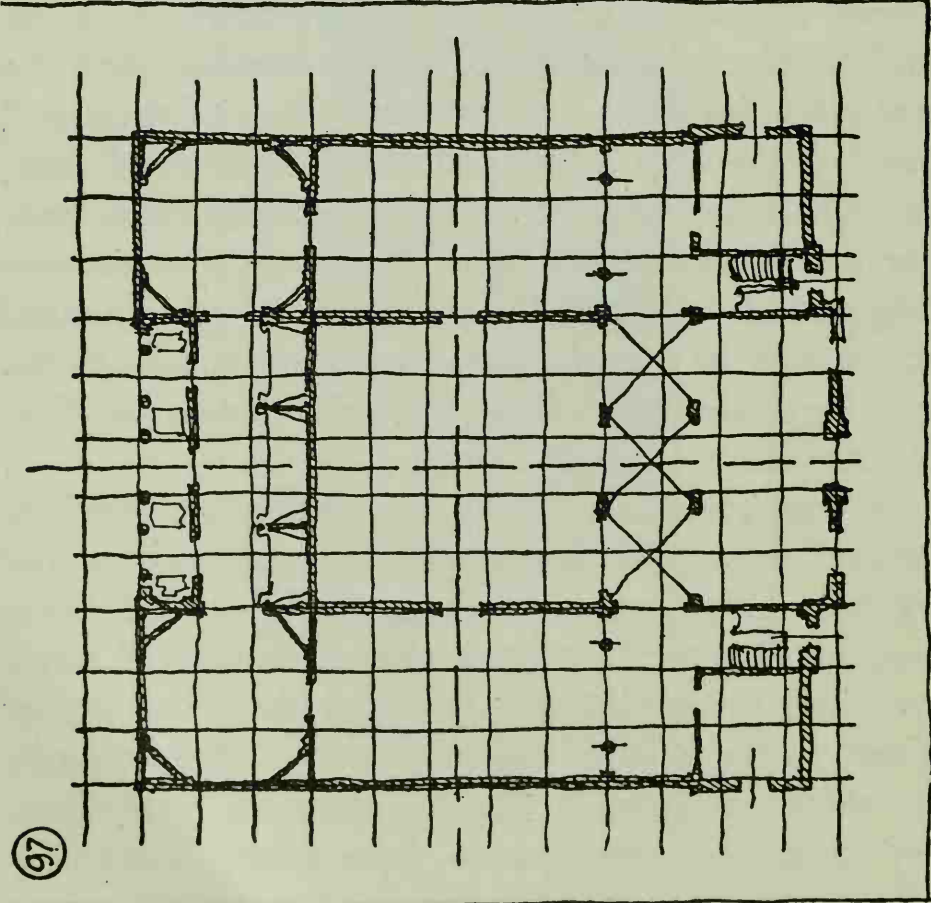
FIG. 96. Geometrical basis of the Arc de Triomphe, Paris. Stability by use of the square and circle.

throughout the design, even as the musician will adopt a unit of tempo. A design built up by the use of squared paper (Figs. 95, 97), or of which the main proportions are dictated by utilizing for each dimension a certain relationship of squares (Figs. 90, 91), would result in the establishment of a certain rhythmic harmony, in the same way as has been suggested in the case of the use of geometrical figures. The result is more than likely to endow the design with a certain stability of proportion, and the method of designing on squared paper, used in all probability largely as a 'check' on the designer's proportions, has been employed with advantage by Renaissance architects and modern designers. An analysis, into units, of various well-proportioned details, such as doors and windows, in classic work, will enable the student to become familiar with the numerical ratios involved, and the knowledge of these will undoubtedly serve as a guide and check in original composition. There are, however, no mathematical rules, and, as in literature, a phrase robbed of its context may become misleading, so it is especially necessary in architectural design constantly to consider the part in its relation to the whole. In any case, the trained eye must remain the final judge of proportion.

Distinct dangers occur in the application of even the most general principles unless the designer realizes the necessity for judgment and discrimination. We have mentioned in Chapter I the need for definition of form, and have cited the satisfaction resulting from the use of such figures as the square, the circle, etc. These figures, however, are so decisive in the regularity of their shape that they create for the eye an impression of stability extreme enough to arrest the vision at the point where



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FIG. 98.—Brunelleschi's church of San Spirito in Florence. Analysis of geometrical proportions and presence of the square as a basis for setting-out.

FIG. 97. Illustrating the use of squared paper in determining the general proportions of a plan.

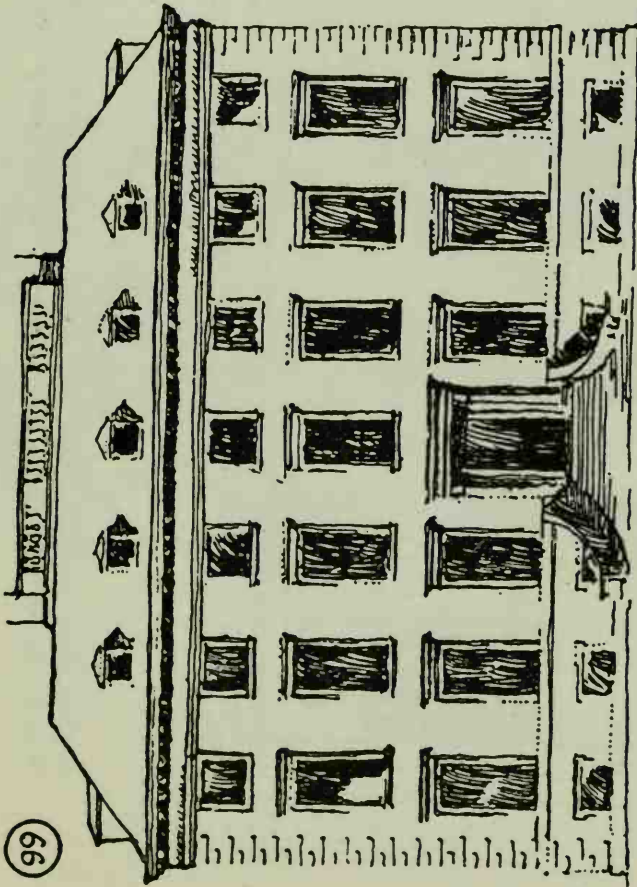


FIG. 99.
Chevening, Kent, by Inigo Jones (from Vitruv. *Brit.* 11). Note how the row of square windows acts as a stop and climax to the scheme of fenestration.

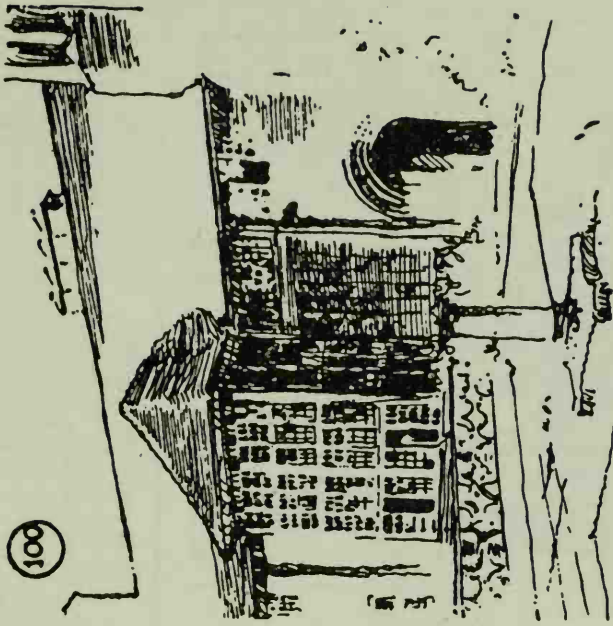


FIG. 100.—Hall window to the 'Deanery Garden,' a house by Sir Edwin Lutyens. The window division is extremely pleasant, the two lower divisions being five panes in height, the upper divisions each four panes.

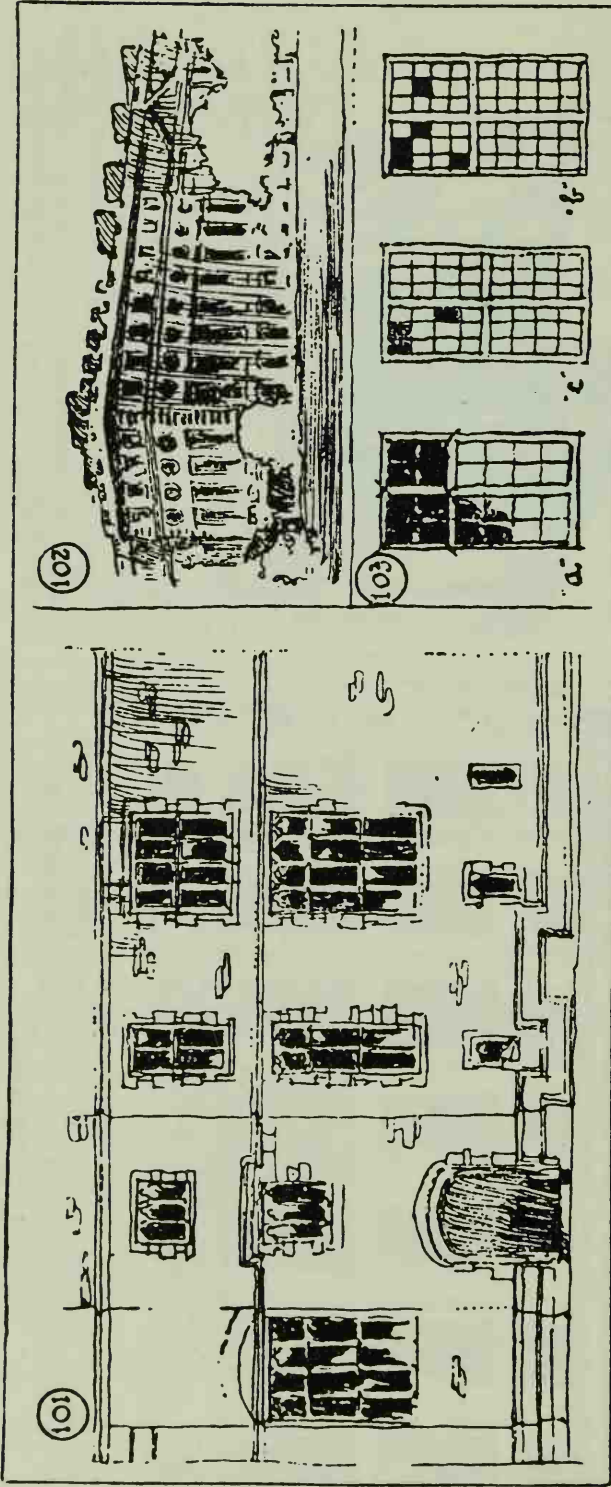


FIG. 101.
Rayland Castle, Monmouthshire (after Pugin). Various types of window.
Note the placing of transoms which in no case gives a square upper division.

FIG. 102.—At Hampton Court Palace the circular and square upper windows duplicate each other's function from the point of view of composition, the effect produced by this 'dual' stop to the fenestration being too emphatic to be altogether successful.

FIG. 103.—Various types of transom division in windows 'a', 'b', and 'c.'

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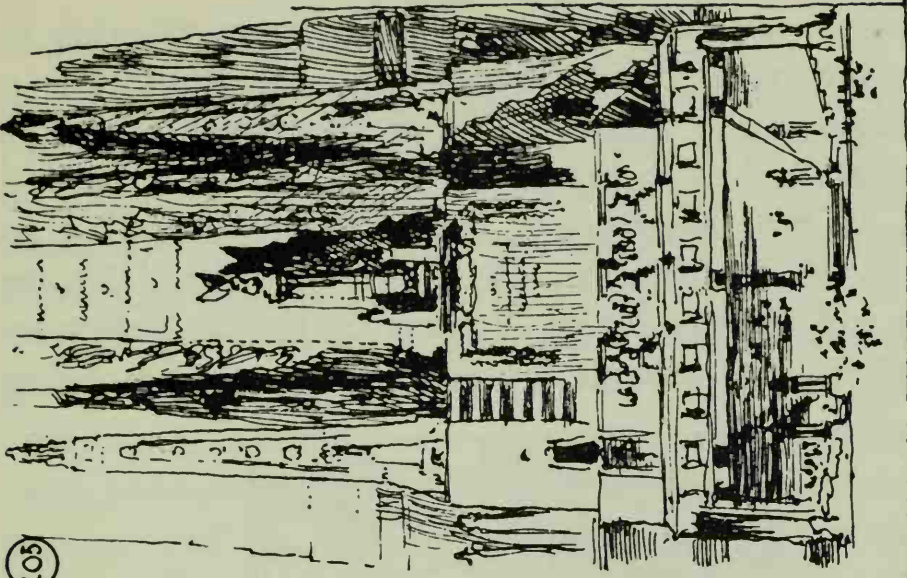


FIG. 105.—Base of design for 'Monument to the Glory of the American Nation,' by Despradelle. Another example of scale obtained by juxtaposition of elements with elements still larger. Note the size of human figures and columns at foot of steps. The columns themselves are large, but appear minute by comparison with other elements.

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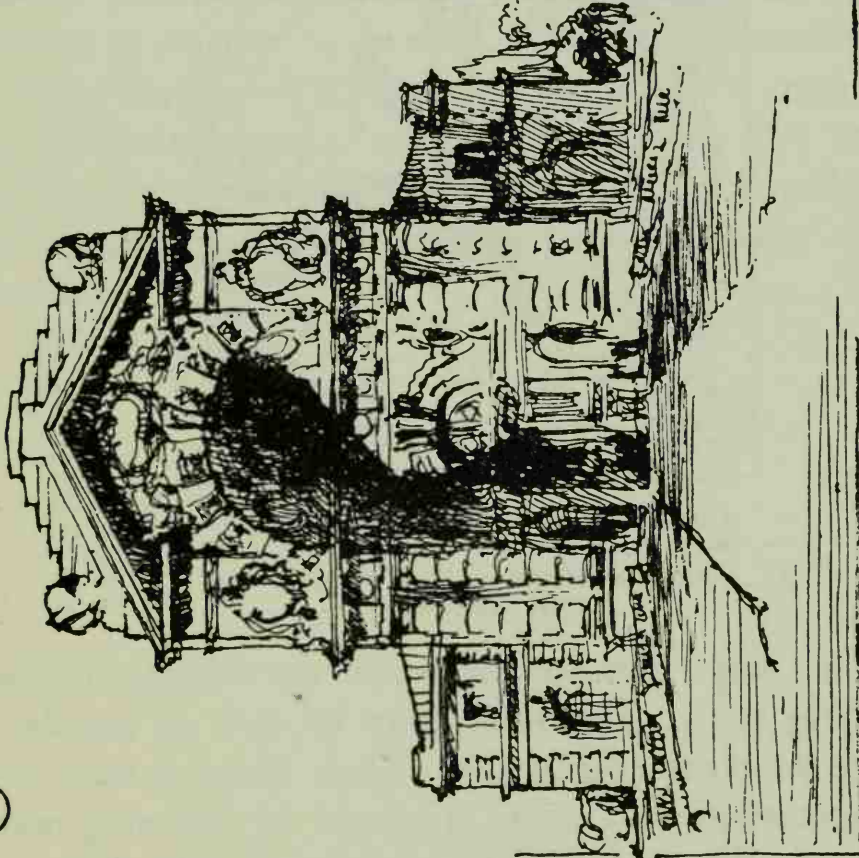


FIG. 104.

An effect of overpowering scale is obtained in this French student's design for a 'Château Entrance' by utilizing elements, large in themselves, to build up an effect of scale through their subordination to elements still greater in size. The wings give scale to the arched doorway, the doorway to the columnar pylons, the pylons to the niche, and the niche to the pediment. The size of the human figure gives a realization of the vast scale of the whole.

they occur. For this reason they are very valuable at certain points in the design, but objectionable at others.

In designing the windows of a façade it will rarely be found possible to use square windows as the 'running motive' of the fenestration. The square shape is so definite as to destroy the effect of continuity. Square openings will often be found, however, in the top or bottom storey, where they provide, by their property of arresting

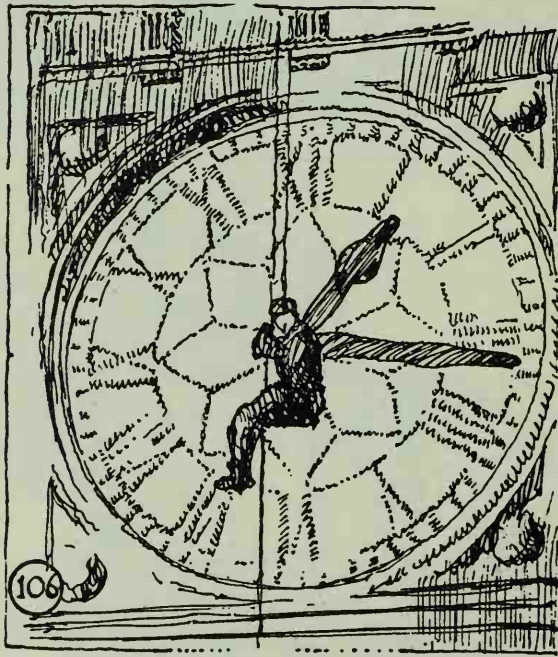


FIG. 106.—A clock dial on a modern building. An instance of the actual size or true scale being conveyed by the accident of the presence of the human figure.

the eye, a 'stop' and completion of the scheme of fenestration (Fig. 99). The same may be said of circular or bull's-eye windows (Fig. 102). Their shape is such as to attract attention and create a pause or 'turning-point,' and they should, therefore, be introduced with discretion. A very subtle case of proportioning of elements occurs in the use of the Elizabethan type of window with stone or wood

mullions and transoms (Figs. 100 and 101). It is rarely found in the best work that the transom is so placed as to produce a square pane above it (Fig. 103 'a'). On the contrary, the division of panes more generally makes the transom occur at an intermediate stage (Fig. 103 'b'), sometimes actually at the centre (Fig. 103 'c').

This last example is less pleasant than 'b,' on account of the equality of the division, but while 'a' seems to fulfil all the requirements of good proportion in so far as ratios are concerned, the fact remains that the square upper portion is of too definite a shape, and by its assertiveness tends to destroy the harmony of the window by attracting attention to its upper part only. From this examination we reach the conclusion that definition of shape is highly desirable in main masses, but the insistence and emphasis resulting therefrom may become worrying if indulged in in all the details, through the creation of too many centres of interest.

VIII

Scale

WE have left to the last the consideration of proportion in its relation to what is known as 'scale.'

Mr. Belcher, in his *Essentials in Architecture*, describes (good) 'scale' as 'the proper relation of the several parts to one another and to the whole in point of size,' which is practically the definition which we have made of proportion.

We would say rather that good scale consisted, in fact, in these relationships of size, but with the addition of the relationship of the parts and the whole to some fixed or assumed standard. What exactly this standard should be is a matter depending on circumstances, but in the normal way we may assume it to be regulated by the human scale, namely, the size of the average human

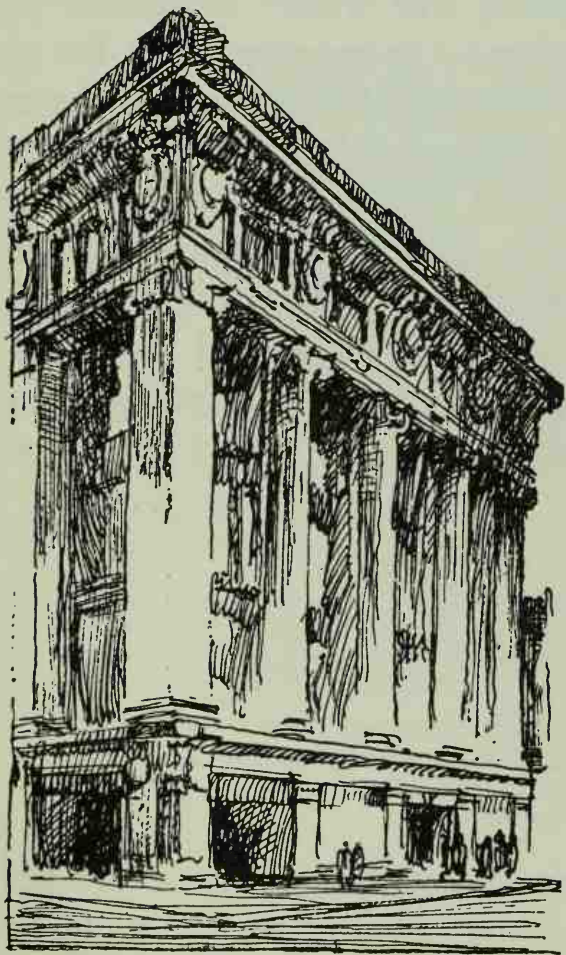


FIG. 107.—The new extension of the Selfridge Store; Graham, Anderson, Probst and White, and Sir John Burnet and Partners, architects. The scale of this building is rather large for most London streets under present conditions, and is probably designed to harmonize with a future architecture on more ample lines.

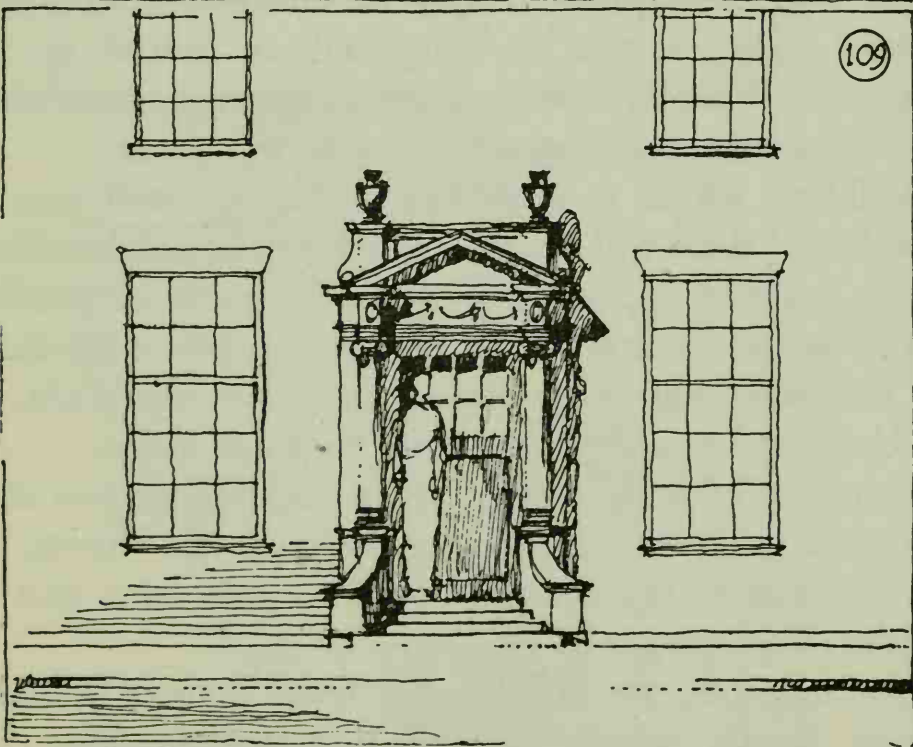


Fig. 108.—House in Grosvenor Street by Blow and Billerey. Finely handled in itself, the scale of the façade is almost too overpowering for the architecture of Grosvenor Street. Note the difference of scale with the adjoining premises.

Fig. 109.—A doorway to a town house which the sizes of the human figure and of the adjoining windows reveal as being too small in scale, and having too many elements for its actual physical dimensions.

figure and the objects which in size are associated with it (Fig. 106). When we say, in a general way, that a building is big or small in scale, we mean that its component parts are, and also visually appear to be, of large or small physical dimensions (as the case may be). The standard by which we judge of these actual dimensions is fixed by an objective or subconscious comparison which we make between the building and some object or objects near it, objects of which we know or assume the actual physical size (Figs. 104-6, 109). A building, to be 'big' in scale, need not necessarily be a big building, but it will be composed of elements unusually large and bold compared to the human figure or to objects near it, such as other buildings, natural features, etc. (Fig. 108). The smaller the object with which we compare the building, the greater will appear to be the building scale. If we imagine a number of Lilliputian men and women standing in front of a normal-sized dwelling, the 'scale' of that dwelling will be forced up by comparison. Should, however, the comparison be with a crowd of Brobdingnagians, the converse will occur.

A building which is described as having 'too much' or 'too little' scale will be one the treatment and handling of which make it appear as respectively larger or smaller than the actual reality. It may well happen, therefore, that a building 'big in scale' may have too little scale, or that a building 'small in scale' may have too much.

Falsification of scale may occur in the relationship of a building, as an entity, with other buildings or objects, or in the relationship of its several parts to each other and to the whole (Figs. 109-11).

If, for example, we imagine the front door of a small Georgian house, which is well designed to have an

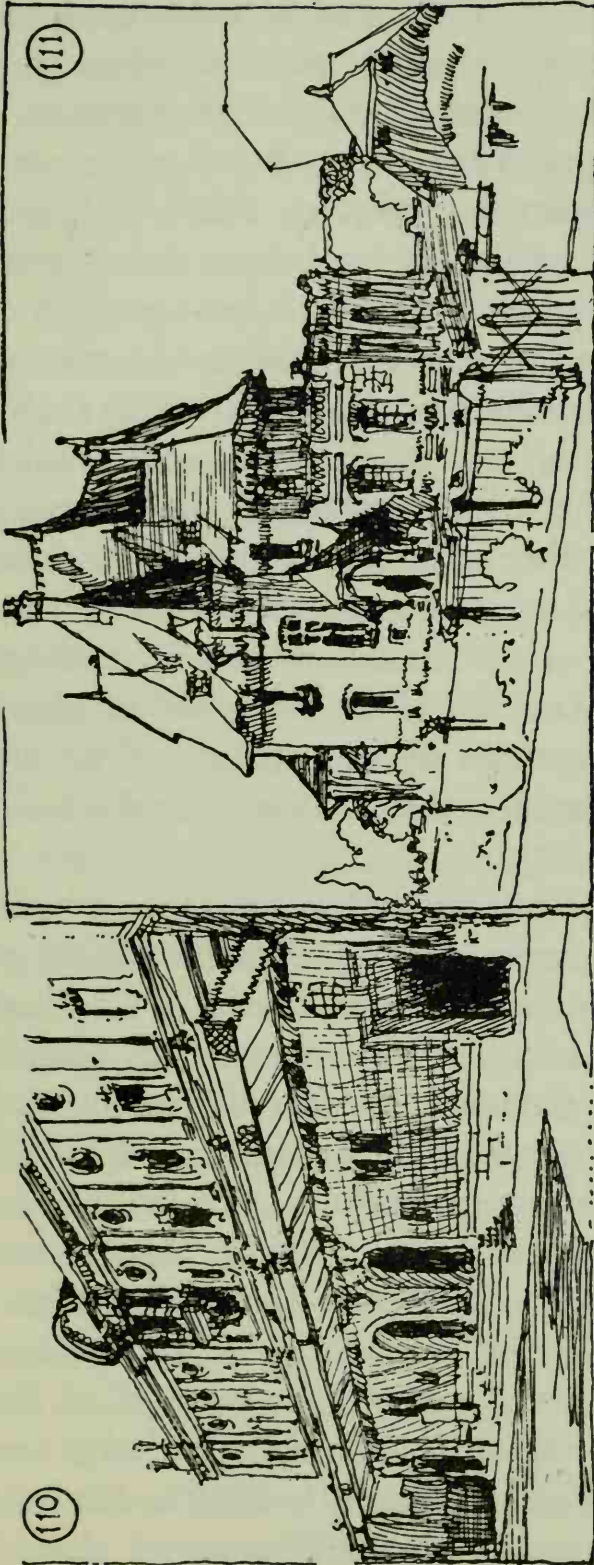


FIG. 110.
A cinema façade in which there is incompatibility between the scale of the two storeys. The scale of the upper storey appears forced by the number and smallness of its elements, making this storey appear larger than it actually is.

FIG. 111.
The introduction of innumerable ambitious elements in a restricted space results in falsity of scale and meanness of effect. This French villa appears to be a large building until the size of the human figure in the porch is observed. The elements are all too small to be treated in so pretentious a manner.

appropriate relationship with the size of the human beings who use it, we find ourselves in the presence of an element which is in good scale, *i.e.* of proportions suitable in mass and detail to its setting and function. But if we construct a doorway precisely similar in type, ten times as large, we have created a design which is no longer an appropriate one. We have taken an element which was intended to be small, and we have made it big. Conversely, we might have assumed an essentially monumental feature, such as a Roman triumphal arch, and tried with fatal results to reduce it down to make it form an appropriate entrance to a kindergarten. In either case we have falsified scale by making our element of a size other than that which would naturally be assumed. For by custom, and by association, certain standards of sizes for different types of elements become fixed and understood by the eye, and if we distort these standards we produce that discomfort which falsity of scale creates (Fig. 111).

Actual physical size alone will not guarantee in a building an appearance of fine scale, and the elements which go to make up a composition cannot be increased in size beyond certain limits without a loss of impressiveness. Instead of unduly inflating our elements, we should rather add to their number, and thus gain by repetition an effect which mere vastness may fail to produce. A classic example, nearly always cited, of failure to produce effect through size alone, is afforded by St. Peter's in Rome. Here we have a scheme consisting of comparatively simple elements which have become overdeveloped, instead of a design depending on the introduction of more elements better related to the human scale. There is lacking in the interior of St. Peter's a sufficiency of elements to give a clue to its

actual size. All its details are large, and there are no objects of any importance to afford a standard of comparison. The church only begins to 'look its size' when crowded with worshippers, for then the human figure gives a clue to the scale, which we at once see is immensely large.

In external work the attainment of good scale is less difficult than is the case with interiors, because in nearly every instance there are surroundings which give the key to actual size. The Arc de Triomphe in Paris derives its effect of scale not only from the beauty and stability of its proportions, but from its setting. It is in excellent relationship with the area of the Place de l'Etoile, and seen from any of the radiating vistas of which it is the climax, its silhouette dominates sufficiently to convey an effect of 'bigness.' For Paris the Arc de Triomphe is correct in scale, but in London, where the scale of the buildings is smaller, it would have to be set in special surroundings to avoid the risk of crushing its neighbours, a risk not always avoided in modern English street architecture, where the influence of large-scale American work is beginning to be felt.

The student of architecture must take special precautions to avoid errors in scale. He should refrain from using, in small buildings, motives which depend largely on ample dimensions for their effectiveness. The Orders, for instance, should not be employed, at any rate in their full classic expression, in cases where dimensions are very restricted. To see a miniature colonnade, complete in every classic detail, with a column about 7 ft. high, is to feel that a feature which is essentially one of dignity and stateliness is being forced down to a scale entirely domestic, in which the human figure will loom so large as to become dominant

and almost patronizing. One does not feel respect for stunted examples of grand motives.

The motives, details, proportions, and minor effects of design suited to domestic work may not be infinitely enlarged in the hope that by so doing a monumental effect will be obtained in their use on a large-scale building. For large dimensions we must employ motives ampler and grander in conception, and qualities of grace and picturesqueness will give way to those of gravity and dignity.

Meanness of scale is very characteristic of poor English work. Details of design so slight as to be appropriate only for execution in wood or metal have been carried out in stone. A multitude of tiny and confused features are applied to façades in the hope of producing thereby an effect of richness and classic dignity. On the drawing, where no key to actual size beyond the printed scale is available, the effects may be passable, but in execution we find the actual dimensions to be so small in comparison with the human figure that the features become mean and even ludicrous.

On the other hand, we find small decorative features, such as swags, lions' heads, acroteria, the egg and dart, enlarged to gigantic dimensions and occupying a space far larger than is warranted by their interest as decorative adjuncts. If features are to be executed on a large scale, they must be composed of a reasonable number of elements, so that each element may be kept sufficiently small in scale to avoid competition with more vital and important features which are really essential to the design. Such elements as steps and balustrades have their dimensions determined by practical necessity, and they form a valuable standard of comparison for judging scale. If we find a

fully detailed balustrade only 18 in. high, we know at once that it is false in scale. And if all the features of the building to which it belongs are in good relationship with the balustrade, we may then safely assume that the whole design is false and 'out of scale.'

Practice, observation, and experience will gradually assist in forming a sense of correct scale values. It is extremely useful, however, to cultivate the habit of measuring and noting the actual dimensions of buildings and features which may remain in our minds as fixed standards of comparison. If we design a window 3 ft. 6 in. by 7 ft., and have in our mind's eye the image of a window of these dimensions, we will avoid the danger of producing a design, which, on paper, appears to be 5 ft. by 10 ft., or 1 ft. 6 in. by 3 ft. in size. If we are familiar with the average spacing of window centres in, say, a typical London house, it will assist us in the setting-out of our fenestration when the problem of a town house arises. A knowledge of actual dimensions of various features in executed work designed in good scale forms the surest stepping-stone to the attainment of a sure sense of scale in original design.

IX

Composition of the Plan

THE principles of composition involved in the production of a good plan may be considered from two different points of view: that which is concerned with abstract design, and that involved in the study of practical requirements. The second aspect is, however, related to the first, since a good plan is not only one in which all practical and functional requirements are fully met, but one which results in the production of an architectural composition having the abstract qualities necessary to awaken the æsthetic and emotional senses of the beholder.

It is the absence or presence of these qualities which determines the difference between a sound, practical building and a fine work of architecture.

With the practical requirements which affect the composition of plans we do not intend to deal, but we desire rather to indicate a few general principles which may be observed in arranging those various components of the plan which the utilitarian needs of the 'programme' have called into being.

The composition of plans involves the application of the same general abstract principles which govern any form of design, but the inherent nature of the plan differentiates it from all forms of design in which the viewpoint of the spectator is external, as is the case with elevations of buildings, with paintings, sculpture, natural landscapes, etc.

The plan of a building is in reality a horizontal section taken through the building at any level desired, but, in

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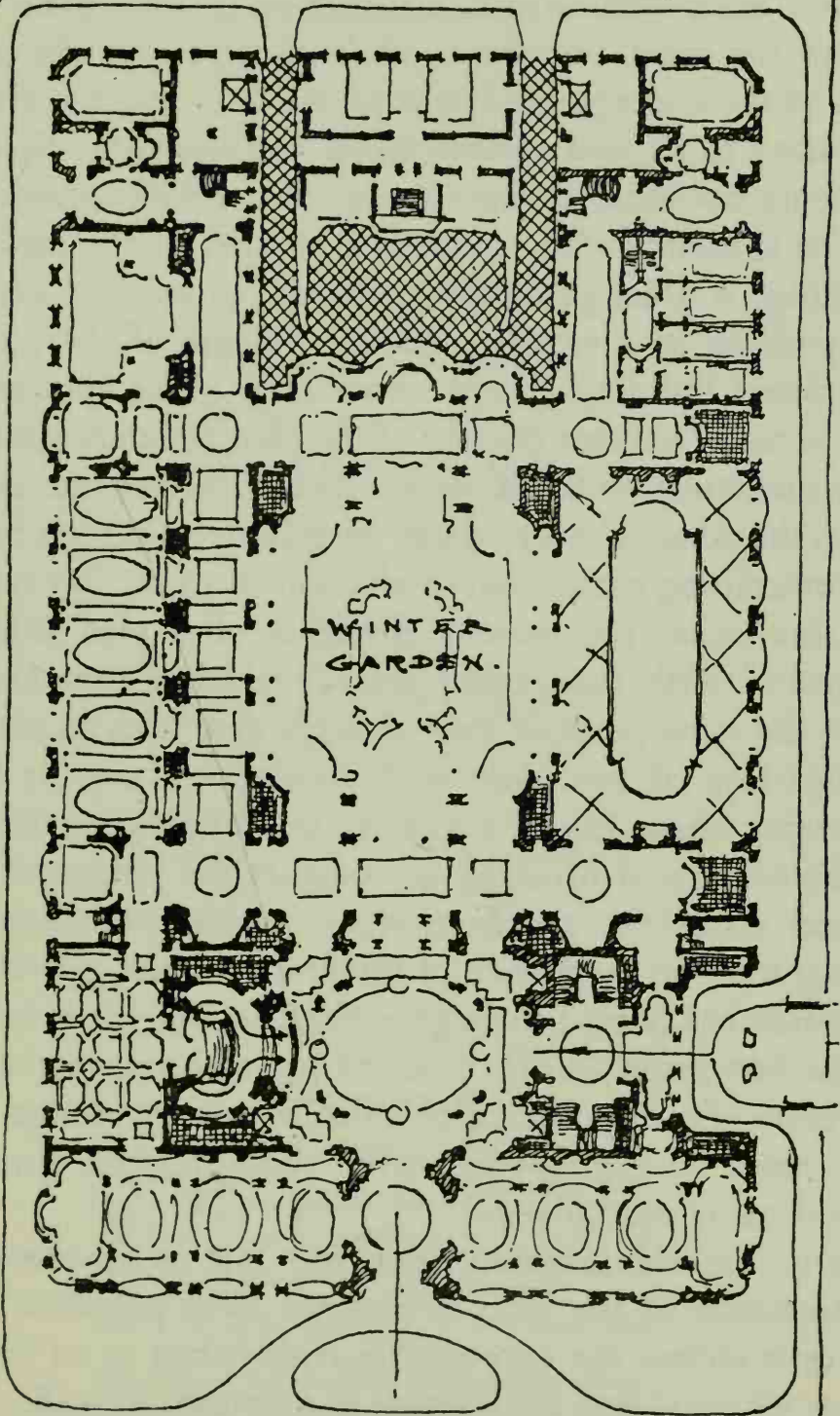


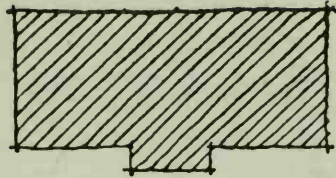
FIG. 112.—An Ecole des Beaux-Arts project by M. Tournon for a City Hotel. Note the balance of different groups and elements on each side of the longitudinal axis, as also the interest and variety of plan shapes, and the careful preparation of the central climax of the 'Winter Garden.'

general reference to 'the plan' of a building, it is the ground floor plan which is assumed. This plan, if not always the most important, at least expresses the general lines of the conception, and contains, not only the elements necessary to its own arrangement, but also those functional elements necessary to the support of the floors above.

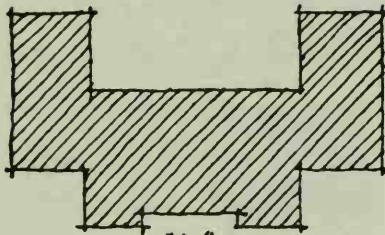
The spectator who examines a picture, or the façade of a building, is able, generally speaking, to see and grasp the composition as a whole. But in the case of the plan of a completed building this is impossible. The spectator can only actually see that portion of the plan which is not limited by obstructing walls and floors, and his perception can only grasp the whole conception by travelling round the building and examining each room or element in turn. By reason of this limitation the various elements of a plan cannot be compared with each other and considered together from quite the same point of view as is the case with an elevation. Comparison of one room with another will not be formed by seeing these rooms together, but by passing from one to the other and utilizing in comparative judgment of the second room the recollection or mental impression persisting from an inspection of the first. When, however, the spectator has passed through several rooms, his recollection of the first room will be dimmed by fresh impressions, and therefore the importance of considering the design of the first room in conjunction with those remote from it is considerably minimized.

It is important to remember this fact in considering the composition of the plan, which we have presented to us, not as it strikes the spectator in reality, but as an image on paper which shows the scheme as a pattern of walls, rooms, corridors, etc., all laid out flat as are the figures on a

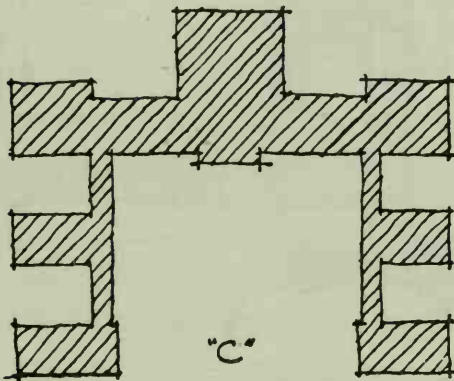
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"A"



"B"



"C"

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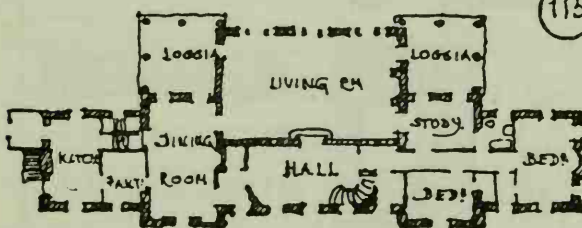


FIG. 113.—Plan types—'A': The single unit.
'B' and 'C': Multiple units.

FIG. 115.—Plan of a house in Virginia (Goodwin, Bullard and Woolsey). A symmetrical exterior arrived at by balance of different elements in the two wings.

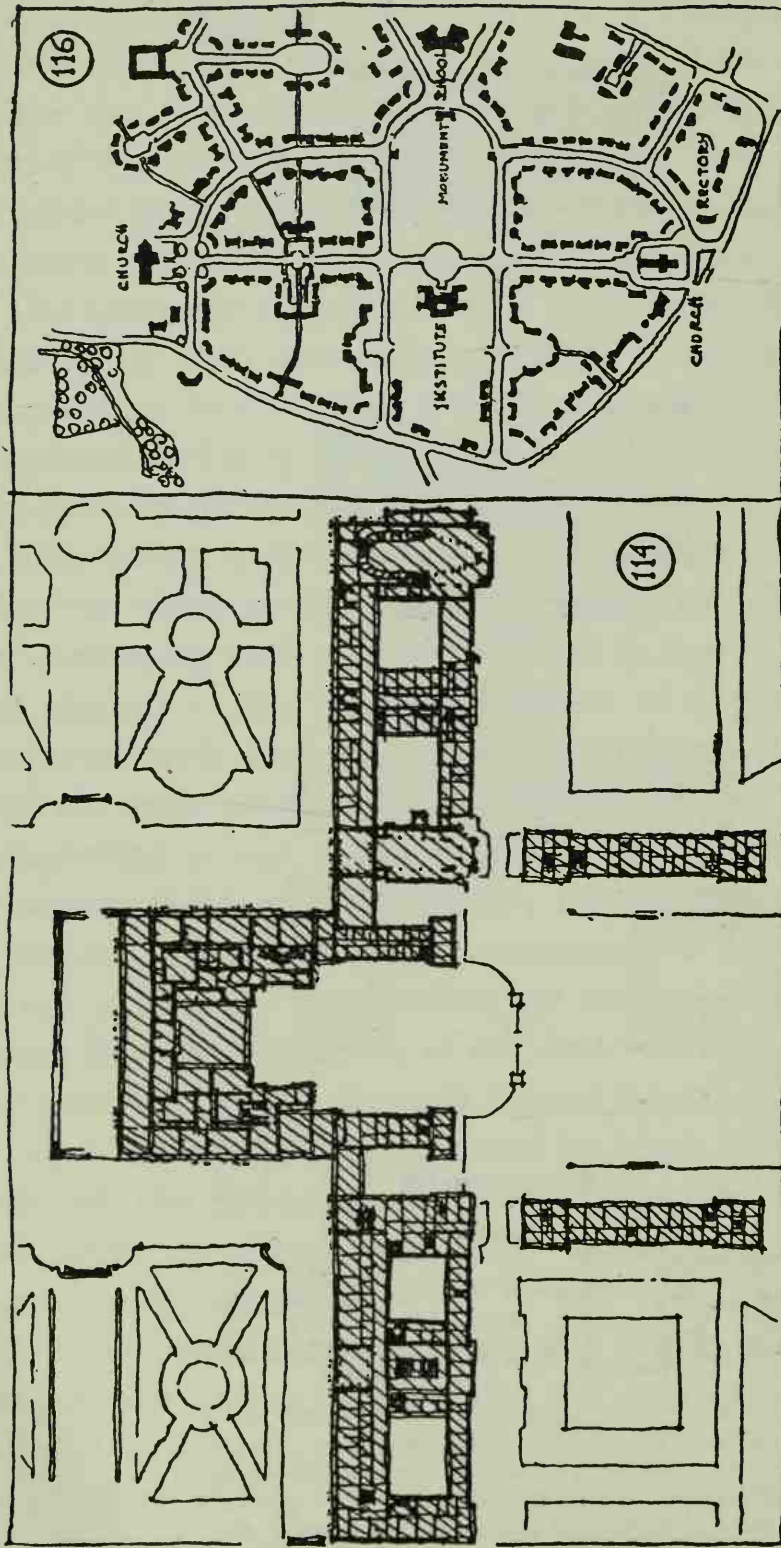


FIG. 116.—Plan of lay-out of Cubley Village, Penistone, Yorks, by Sir Herbert Baker, showing small units repeating and used by their grouping to form centres of interest. Accent of various points is provided by communal buildings, churches, etc.

FIG. 114.—Ground plan of the Château of Versailles. Note the preparation of climax through the diminishing recessed entrance courts, and the right wing with chapel and theatre, forming a balance to the left wing, in which the unit elements are different.

painting, and, therefore, regarded as the elements of a piece of design, affecting each other according to the laws of abstract composition, which we have already reviewed. There results from the examination of this plan pattern, on paper, a desire for a certain harmony and balance of shape which is entirely natural, since these shapes are in fact the outline of the forms of the rooms and spaces in the building. But there is this difference, that whereas in the drawing we may hesitate to make one side of a balanced plan contain elements which are not duplicated on the other side, on account of spoiling the beauty of our plan pattern, yet in reality the arrangement might be quite legitimate and not unhappy in effect, since the spectator inside the building cannot see both sides at once and be disturbed by the lack of absolute symmetry (Figs. 112, 114, and 115). The student of planning composition must, therefore, remember that he is dealing with a solid building and not merely with the composition of the image or pattern of the plan projected on to a sheet of paper.

The plan of an architectural conception cannot be considered as an independent entity, for it is directly related to the sections and to the elevations. The proportion of a plan may be beautiful in itself, but since the plan is geometrically merely the horizontal projection of the solid of the building, we are directly concerned with the other projection of this same solid, namely that on the vertical plane. If the proportion in the vertical section is bad, the good proportion of the horizontal section alone will not ensure that the building can be developed into fully realized beauty.

The plan, whether it be of a single building, or a group of buildings, requires the same series of Dominants, Contrasts,

Climaxes, and Accentuations as is the case with the elevation. In the same way must the idea of Unity in composition be maintained.

Plan compositions resolve themselves into innumerable categories. There is the plan composed of a single simple unit, with or without very minor subsidiary units, such as, for example, a rectangular block with a projecting portico (Fig. 113 'A'). There is the composition formed of a main central block with minor, but nevertheless important, blocks attached to it (Fig. 113 'B' and 'C'), or that consisting of one main block with subsidiary units entirely detached (Fig. 114). Or, again, the scheme may be composed of a multiple repetition of a single unit, the subsidiary and main climaxes of the composition being obtained by a grouping or massing of the units at certain determined points; compositions of this kind occur in civic design such as in the lay-out of housing schemes, etc. (Fig. 116).

The planning of individual buildings or groups is again subject to sub-division into categories, for we find monumental grouping with symmetrical (Fig. 113 'C'), balanced (Figs. 114 and 117), or asymmetrical (Fig. 118) plans, and smaller compositions of domestic buildings, formal or picturesque in grouping as the case may be.

The manner in which we approach the composition of a plan will be directly affected by the type of subject with which we are dealing. The more grandiose the nature and purpose of the buildings, the more monumental, orderly, and dignified will be the appropriate treatment in plan (Figs. 114, 117, 122), as in elevation. If on the other hand the subject is of an extremely modest or utilitarian character, we shall subordinate dramatic effects, emphasis, and general richness of plan form to the expression of a simplicity and

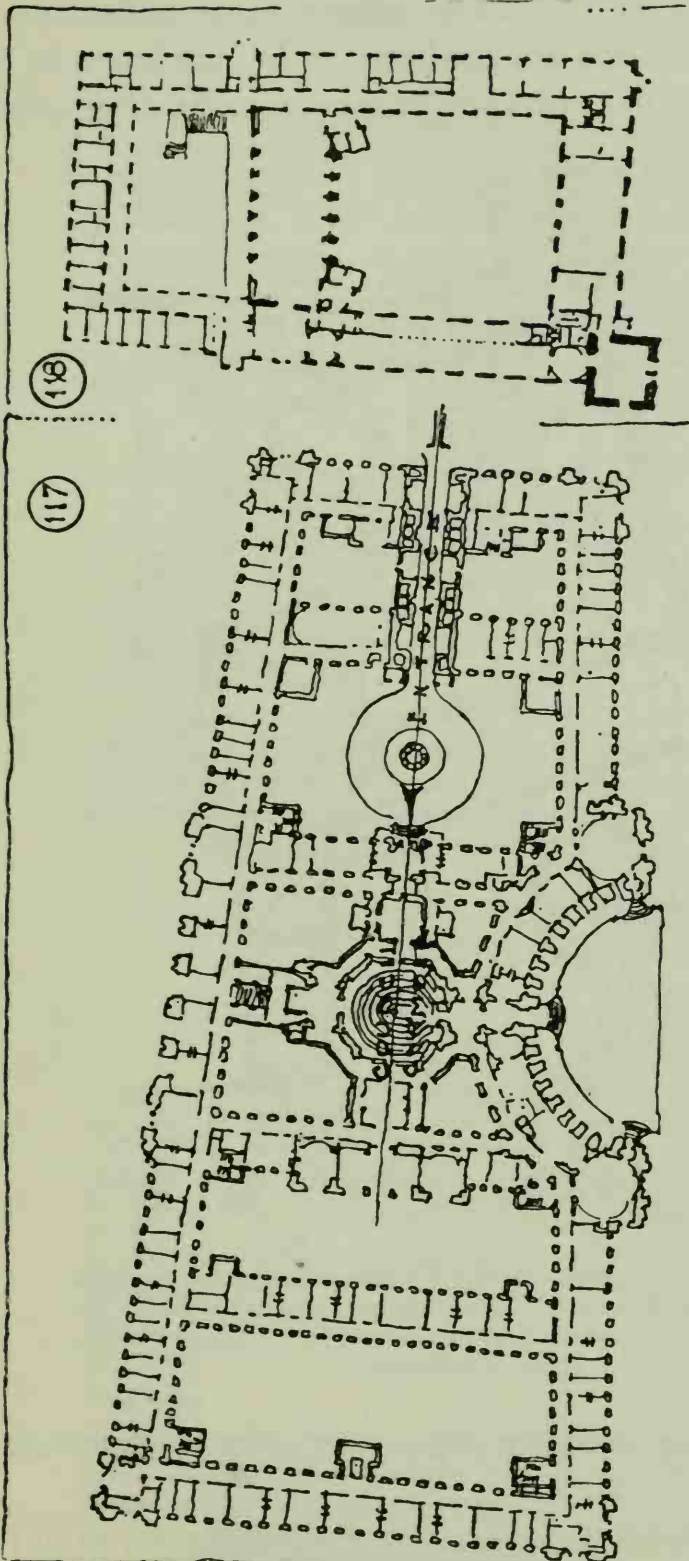


FIG. 118.—Plan of the new Town Hall, Stockholm, by Ragnar Östberg. The site demanded an asymmetrical scheme, and the plan generally is treated in a mediæval rather than a Roman spirit.

FIG. 117.
Plan of the new London County Hall by Ralph Knott. The central Council Chamber is the focus of the scheme. Note the approaches to the climax and also the treatment of the façades in which the requirements did not suggest much plan modelling.

directness suitable to the more unassuming nature of the building with which we are dealing. We may learn to produce a plan composition giving great expression of emphasis,

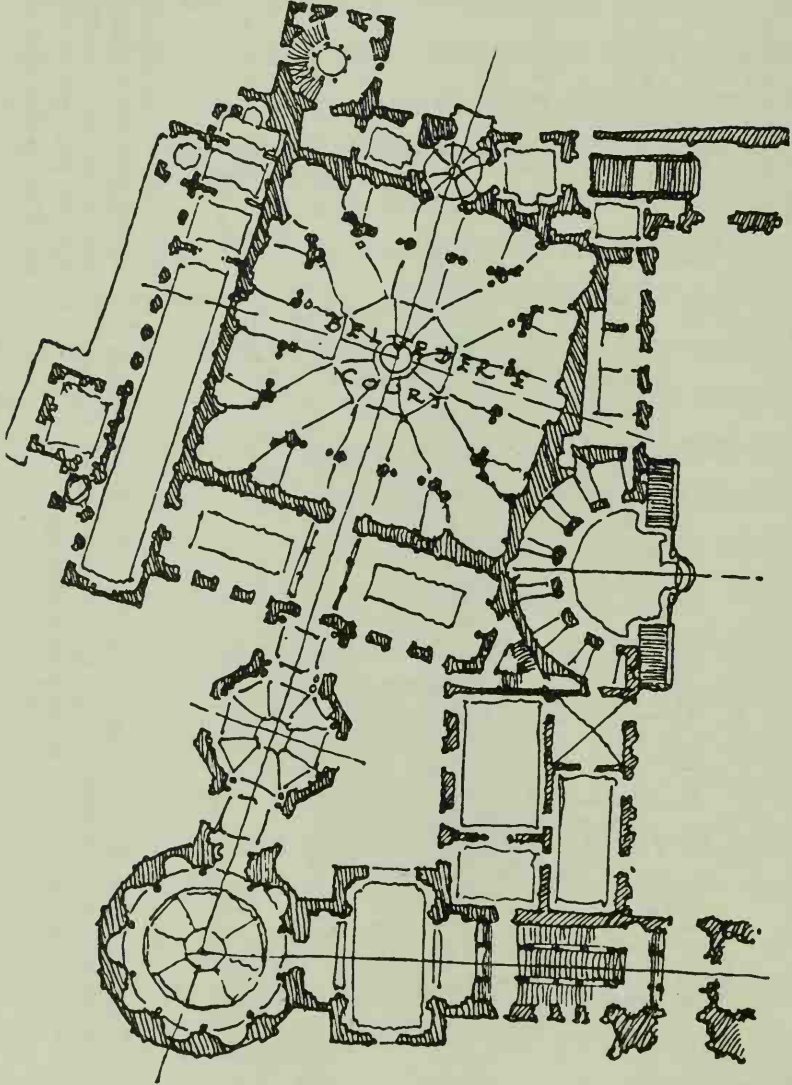


FIG. 119.—Sculpture galleries at the Vatican, including the octagonal open court of the 'Belvedere.' Interesting plan shapes justified by the special purpose of the rooms and galleries laid out for the display of choice works of sculpture.

but we must only employ this type when emphasis is justified.

In the study of a large monumental building we shall find

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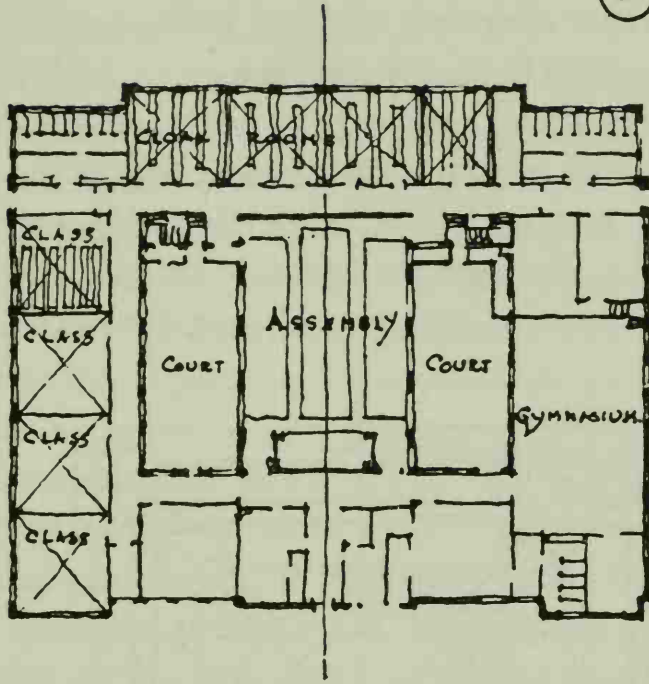


FIG. 120.—A modern school plan, by Edward T. Allcock, with the Assembly Hall as focal point. The classrooms and cloakrooms are treated as sub-divisions of a block or unit, and not as individual isolated elements.

121

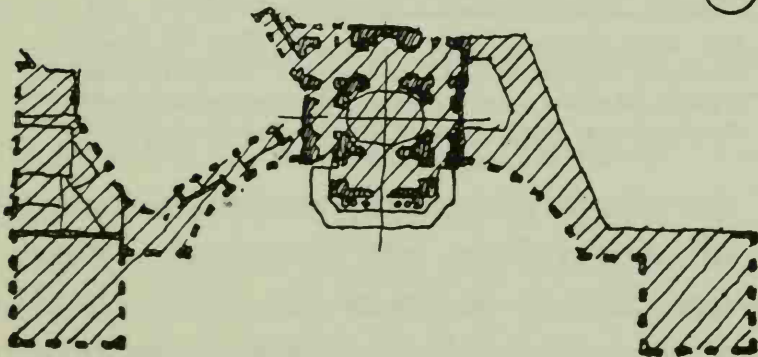


FIG. 121.—Plan of the front portion of the Palais de l'Institut, Paris. An example of magnificence and dramatic effect gained by a recession of the domed central pavilion, linked to the end pavilions by curved walls lower in height. The central pavilion is in the nature of a prepared climax.

that the practical requirements of the programme have called for certain elements such as halls, rooms, corridors, services, etc., which are of varying bulk and importance. In nearly every case there will be some single element, or group of elements, which forms the keynote of the building's requirements, and to which other elements are subsidiary in importance. We have therefore an immediate suggestion for the elements of a grouping, since the most important

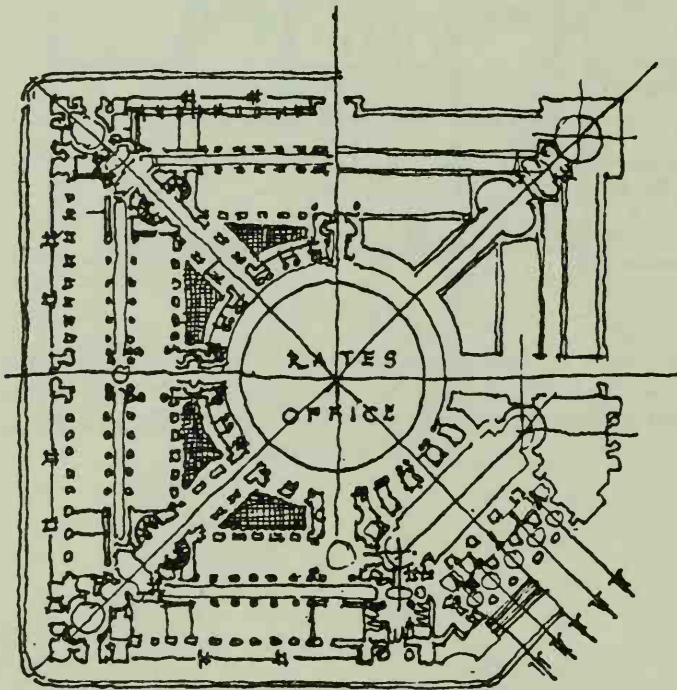


FIG. 122.—Diagram plan of the new Port of London Authority Building by Sir Edwin Cooper. The Rates Office is the focus of the scheme. Note the preparatory vestibules, the plan shapes giving points of interest, and the proportions of rooms to circulations.

feature of the plan will logically constitute its focal point and centre of interest (Figs. 117, 120, 122). We then note that there are further elements of slightly less interest, which are either sufficiently important to form secondary climaxes or at least to serve as an accompaniment and support to the principal climax. The purpose of the building has dictated our elements, but once the fulfilment of

function is satisfied, we may place them to the best architectural advantage.

Having decided upon the relation of our main elements, we must so place them that the plan reveals and accentuates their position of importance, giving to them due emphasis, and for this purpose we shall have recourse to the devices of composition which we have already explained, namely, effective use of proportions, contrast, and accentuation. The decision to express a focal point or climax in a plan presupposes an effect of preparation, a leading up by stages to the ultimate strong effect which we wish to realize. It will therefore be advisable to place our main focal point in an important position or in such a way that there is a series of smaller elements preceding it, the passage through which enhances the nobler and more ample size and scale of our main climax (Figs. 117, 122).

For this reason it will be found that a group of monumental buildings is very often laid out, where circumstances permit, with the focal point centrally placed, not at the first point of the spectator's arrival, but as a deferred climax to which he must attain after a preliminary preparation of passing by or through less important elements; such an arrangement guarantees the spectator against any sensation of anti-climax (Fig. 112).

In the practice of composition, this result is attained in a variety of ways. An arrangement productive of monumental effects consists in the planning of the group in receding planes, the climax being centrally placed at the furthest distance from the point of arrival, so that the preparation is long enough to be impressive without producing fatigue. An excellent example of this type occurs in the Château of Versailles (Fig. 114). Practical reasons may,

124

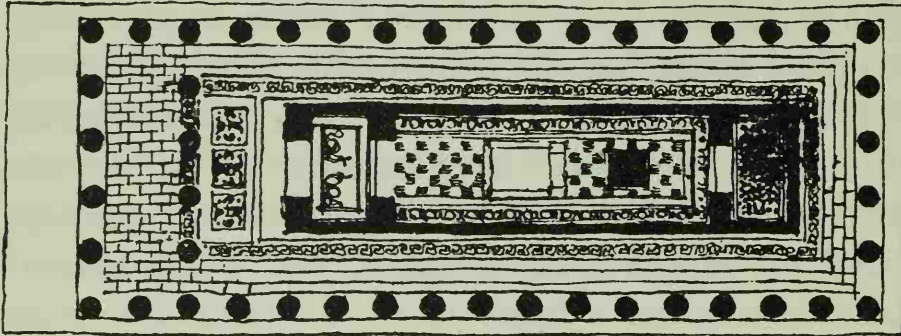


FIG. 124.—The Temple at Selinonte as restored by Hulot. Note the plan mosaic which is here not a conventional indication, but represents the actual flooring. The design of the mosaic is very well related to its position in the various parts of the plan, the more brilliant patterns being reserved for the points which it is desired to emphasize.

123

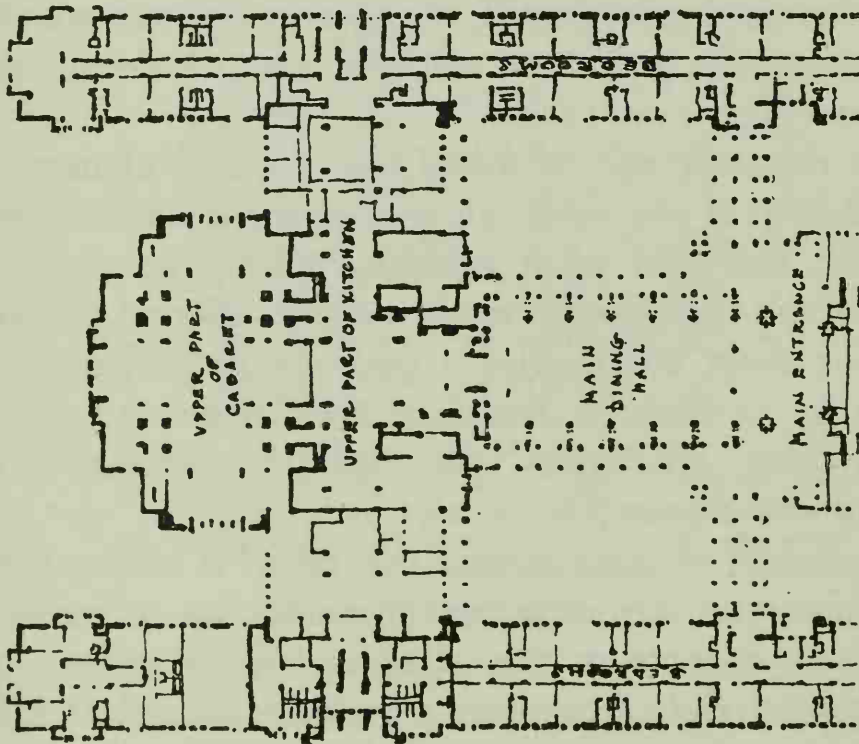


FIG. 123.
Imperial Hotel, Tokyo, by Frank Lloyd Wright. The plan lay-out reveals the simple rectangular modern construction in reinforced concrete with main points of support and thinner curtain walls. Note the difference in weights of walls, expressive of the varying spans and character of the plan divisions.

however, dictate a grouping in which such an effect is impossible, and where the various buildings of the group must be arranged on a slightly recessed or an approximately straight line of frontage (Figs. 117, 121). In this case we must compose the plan so as to give, by effects of bulk and massing, such preparation as we can, and by arranging the secondary elements on a scale permitting their more modest planning to afford a foil to the generous and ample arrangement of the main central group. In such instances it is probable, however, that effect will be due less to composition in plan than to appropriate emphasis in elevation and section.

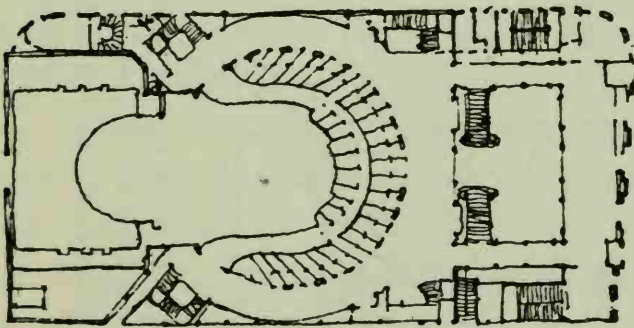
The planning of each single unit of the group will be governed by the same general desire for effective disposition. We shall arrange our main rooms and halls in a focal position and lead up to them in as impressive a manner as possible. The handling of the various elements of the plan, the main and secondary room or halls, the vestibules and staircases, and the various minor services, will be governed by the general principles of composition. The principal elements must form a strong dominant, and be of simple monumental shapes obeying the requirements of definite and unhesitating proportion. The secondary elements should present such a treatment of form that they will provide interesting contrasts with each other as far as possible, and they should not logically be mere repetitions 'in petto' of the principal climaxes. (Rooms which fulfil absolutely identical functions, such as school classrooms, etc., will not, of course, require different shapes in plan, but such rooms are considered merely as sub-divisions in a block, and it is the block itself which becomes the element to be considered in its relation of contrast and proportion to another block

(Fig. 120). The necessity for contrast in the proportion and form of rooms and other elements arises from the desire to maintain interest, and to enable each element to be an expression, in its plan-shape, of its particular function.

Shapes which are rich and interesting in design should be reserved for rooms where it is desired that a character of special interest, richness, or grandeur should be expressed (Figs. 112, 119), and would be misplaced in the planning of unimportant rooms and services. Shapes, such as circles, ellipses, octagons, etc., are, as we have already stated, extremely definite, and they therefore create centres of interest. We must not in consequence employ them too freely, or we run the risk of spoiling our effects by repetition, and obtaining too many minor focal points.

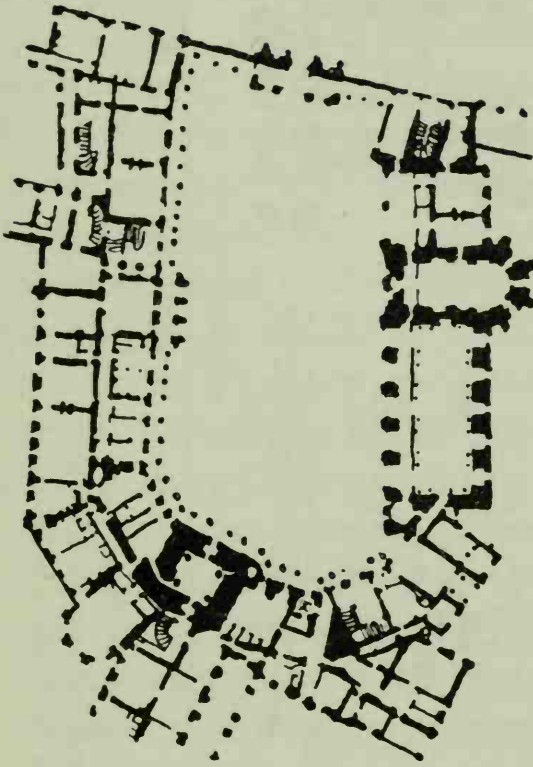
Such features as entrance halls, vestibules, and corridors, should be planned in a similar way to avoid any competition and weakness of effect due to equality of size and form. If our entrance vestibule is a rectangle, the inner hall should be an apartment of different shape, or if it be a rectangle, the rectangle should be of frankly different proportions or orientation. Our staircase hall or 'cage' should be proportioned in such scale as not to detract from the dignity of the hall, to which, on account of its function, it will probably be subsidiary. The plan for a hotel illustrated in Fig. 112 is admirable in its treatment of shapes and the proportions of its various elements.

A satisfactory plan will necessarily be one the arrangement of which is easily grasped both by persons using the building and by the architect who 'reads' the plan on paper. In addition, the drawing of an excellently proportioned scheme will present a pattern design the beauty of which will immediately satisfy the desire of the trained



125

FIG. 125.—Theatre of the Champs Elysées, Paris, by A. and G. Perret. A glance at the plan reveals the light modern construction evidenced by thin walls and widely spaced points of support. The plan shapes follow the type of construction, and are but little imitative of solid masonry.



126

FIG. 126.
The so-called Cour Ovale at Fontainebleau. Note the old-type expression of plan weights resulting from solid masonry construction with enormous reveals and wall thicknesses required by the thrust of vaults, superposition of towers, etc.

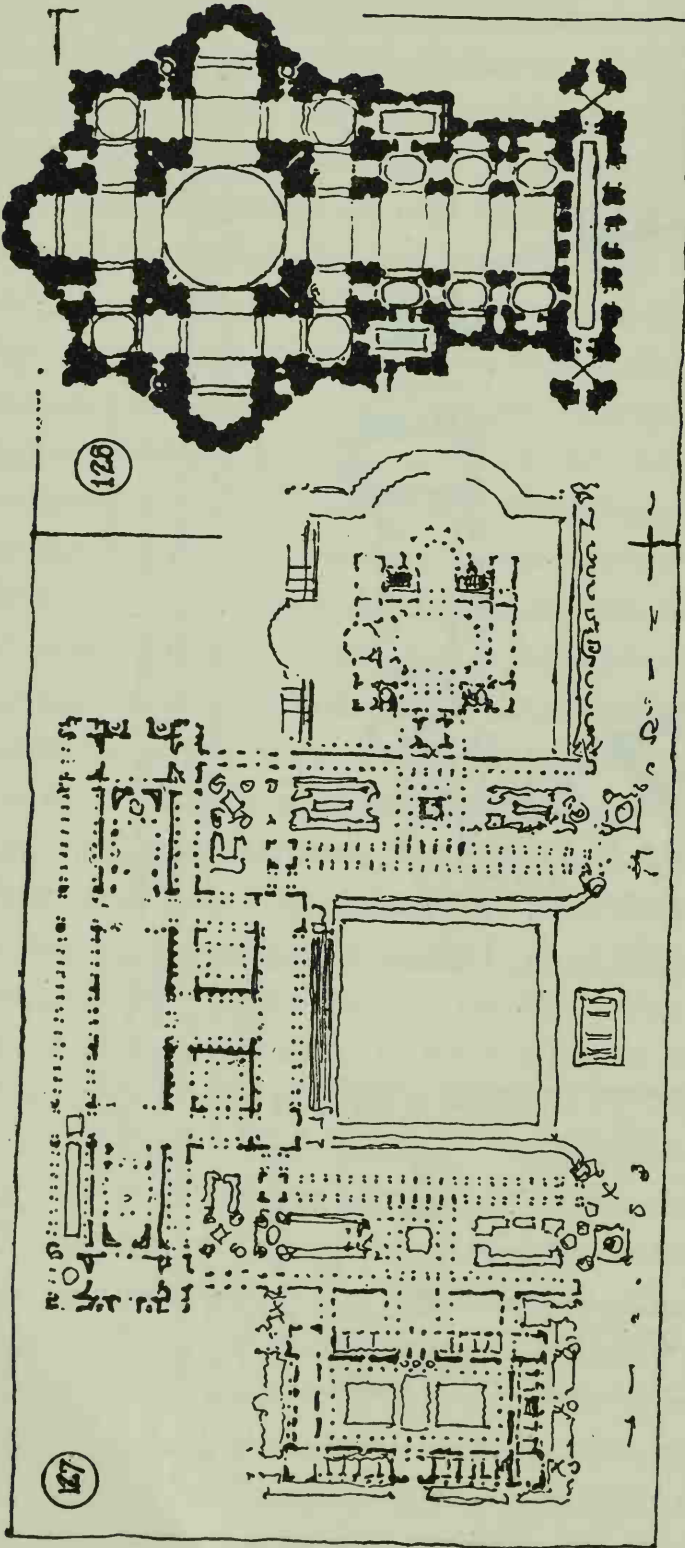


FIG. 127.
A second Grand Prix design for 'the Residence in Morocco of the French Representative,' by M. Leconte. Note the generally symmetrical lay-out relieved by the diversity of mass and treatment in the two wings which lessens the note of formality.

FIG. 128.—St. Peter's at Rome. A plan reminiscent of the heavy construction of Roman work, with plan shapes hollowed out of the solid. The 'weights' of the supports reveal the location of the dome and its abutments, greater than those required by the simpler problem of the construction of the nave. Contrast with Plans 123 and 125.

eye for nicety of balance, relationship of parts, and 'weight' of walls and piers.

The term 'weight' refers in this instance to the relative emphasis which is given to different functional features, such as walls and piers, in the actual drawing, and this weight must of necessity be dictated by all the structural and æsthetic considerations which govern the thickness and general dimensions of these elements. The thicknesses of the walls and piers, as drawn on the plan, constitute a fairly safe guide to the form of the building, since they indicate the relative heights to which the walls and piers are carried. It may be taken as a general rule, in the usual type of construction, that the walls and piers of lofty structures will be thick, as will also be all those bearing considerable weight. Unimportant and non-bearing divisions will naturally, on the other hand, be relatively thin. Very important rooms, even though of no special height, will in addition, often require thick walls, because of the desire for the richer treatment which is afforded by the resulting depth of reveal (Figs. 112, 118). We may, therefore, conclude that the presence of heavy 'weights' of wall and pier on plan indicate that the parts of the building where they occur are of importance either in actual dimensions or at least in function and character (Figs. 123, 126, and 128).

The power to express the form and character of the building in plan largely depends on the nicety of the architect's appreciation of plan form and his ability to give proper weight to the indications of his walls. The resultant image will be readily understood by anyone who has developed similar powers of expression, and will very often convey, better than any title or notes, the relative importance and functions of the various parts of the building (Fig. 128).

130

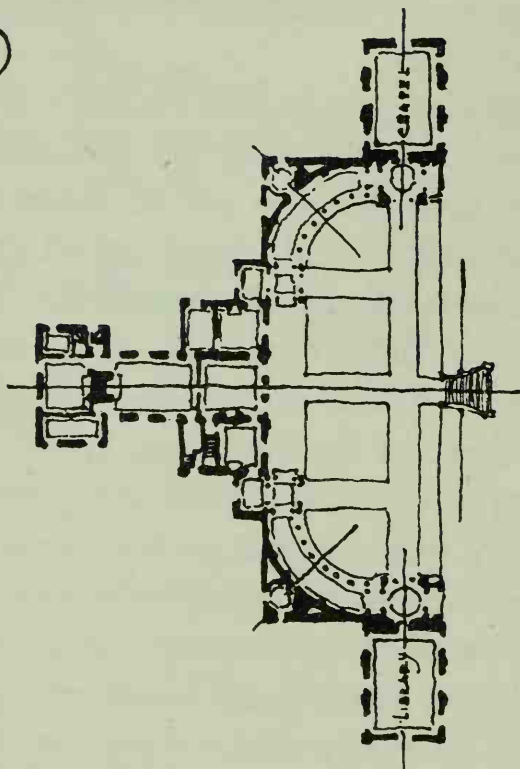


FIG. 130.
 Stoke Park, Northamptonshire (from Vitruv. Brit. III). Said to have been brought from Italy, this design ambitions a fully monumental type, with subsidiary and focal climaxes and formal axial planning. The mass of the central block is weak compared with the wings.

129

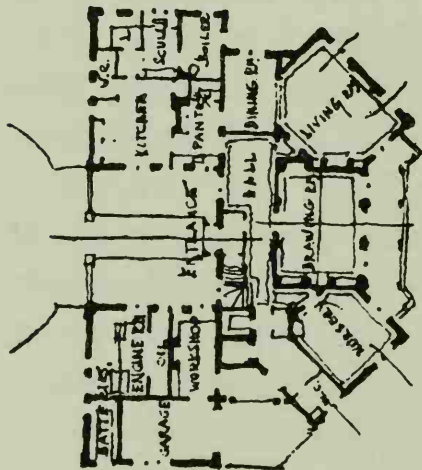


FIG. 129.
 House at Cumnor, Oxford, by de Soissons and Wornum. An example of the ingenuity in the balance of different elements, and a semi-monumental type of lay-out applied to a small-scale residence.

This strictly logical expression of form and structure is materially assisted by what is termed the 'mosaic' of the plan, which consists of an indication on plan of the degree of importance or subordination which the architect intends to attribute to the various apartments and circulations. It is carried out in a convention consisting of the projection on plan of ceiling design or actual floor mosaic (Fig. 124); such indications should accompany but not obscure the main lines of the plan (Fig. 112), and they are readily understood and translated into significance by an architect accustomed to the 'language' of the convention. To others the 'mosaic' of the plan will convey nothing more than meaningless lines and an attempt to produce 'prettiness.'

The adequate expression of the modern plan presents a rather more difficult problem than was the case before the introduction of steel and reinforced concrete. The old forms expressive of the vault, the dome, and the thick walls of stone construction, with their richness of form and modelling, have given way to the rectangular and simple shapes framed by walls which are economically light and vary but slightly in 'weight.' The great difference of expression resulting from the use of modern methods of construction is exemplified by the comparison of such plans as are illustrated in Figs. 126 and 128 with the plan of the Champs Elysées Theatre (Fig. 125), and the plan, by Frank Lloyd Wright, for the Imperial Hotel at Tokyo (Fig. 123). The latter, though having a certain weight of wall thickness required by special conditions, yet reveals in its plan forms a modernity which will be readily apparent to the practised eye.

We have spoken in a general way of the principles which affect the composition of the plan; and while realizing that

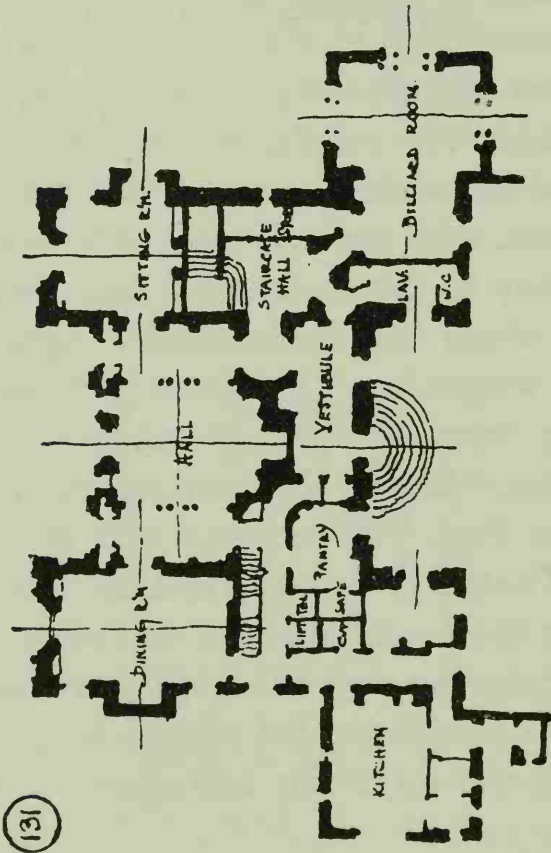


FIG. 131.

House at Ilkley, Yorks, by Sir Edwin Lutyens. Built in the grand manner on a small scale, this plan shows both formality and playfulness. It is a luxurious type, and not typical of modern economy, either in planning or construction, but is interesting as a successful study in a definite manner.

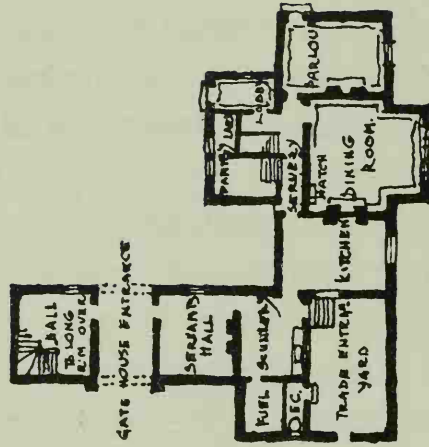


FIG. 132.

Little Garth, Syresham, by Biddulph Pinchard. The typical English informal and 'romantic' plan type. Axial lines avoided, and picturesqueness and intimacy aimed at rather than stateliness.

the subject is so vast that to treat it exhaustively might well occupy several volumes, we may, nevertheless, refer to one or two notable divisions into which plan compositions seem naturally to fall.

The plan type of any building will naturally be influenced by the many practical requirements and limitations which are imposed upon the architect, but it may also be influenced very largely by an abstract quality of character which the designer considers to be necessary in its expression, and which will assist in determining the general form in mass and grouping.

The plan types of large buildings seem to divide themselves into three main categories, already alluded to—the symmetrical composition (Figs. 123, 129, 130), the asymmetrical (Figs. 118, 132), and the composition which is symmetrical in general mass, but in which the two groups on either side of the axis of symmetry reveal certain minor dissimilarities of form and detail. This latter we have termed the 'balanced' composition. The symmetrical composition contains all the elements of stateliness and formality which render it suitable as the plan type for the most important and impressive edifices, and for buildings which occupy a central or focal point in any general lay-out scheme.

The asymmetrical type develops naturally on certain sites where such conditions as differences of level or the requirements of town planning combine with certain detailed requirements of the plan to suggest a solution in which the character of formality necessarily tends to give way to that of picturesqueness, though a high degree of impressiveness and dignity may yet be maintained, as for example in the new Stockholm Town Hall (Fig. 118).

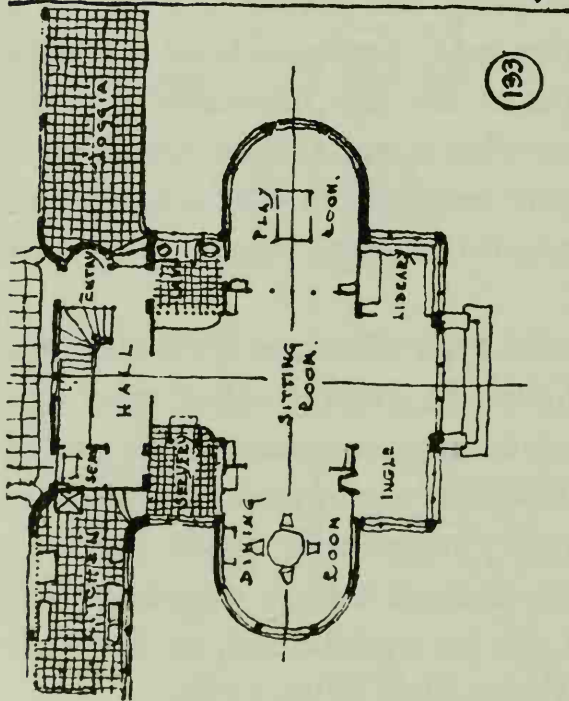


FIG. 133.
 A French villa of concrete construction by Le Corbusier Saugnier.
 A very interesting and ultra-modern type, the domestic dwelling
 handled like an hotel on a small scale. Marked axiality and
 suave treatment of shapes.

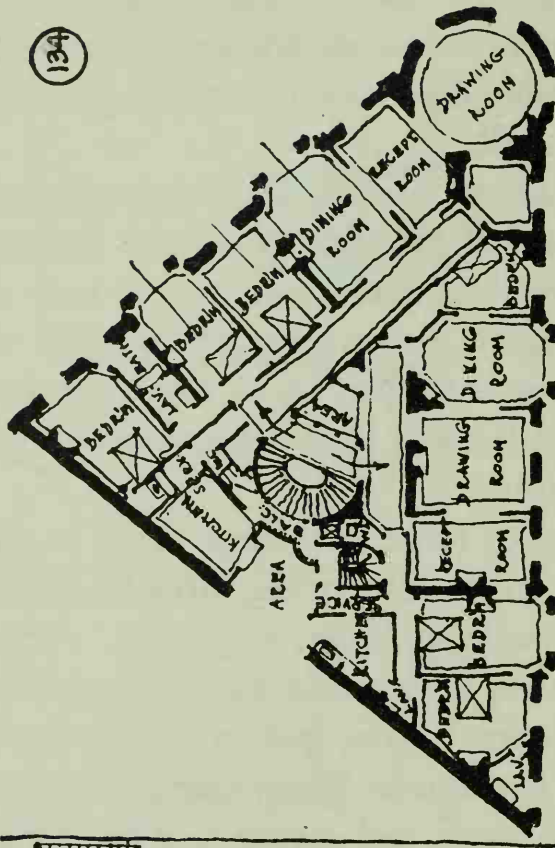


FIG. 134.
 Paris flats, by M. Thion. Typical French planning, axiality,
 carefully studied and balanced shapes, and an ingenuity of
 treatment in the avoidance of awkward forms which English
 economy would only rarely permit in a similar case

The balanced composition lends itself to plans in which general requirements of function, character, and site dictate a symmetrical scheme, while at the same time advantage is taken of certain minor variations in the schedule of accommodation to strike a note less formal or severe than is the case in the strictly symmetrical composition. An example of this type occurs in M. Leconte's plan for an official residence (Fig. 127), though it should be noted that the balance here is somewhat forced, and is more apparent on paper than it would be in reality.

The nature of the programme must inevitably dictate the type of composition, but it must be approached with an open mind, lest, for example, the architect finds himself forcing a preconceived regular type of plan, dictated perhaps by a delight in symmetry *per se*, on to a site which demands an entirely free and irregular composition. Architectural fashions in plan type are just as prevalent and insidious as fashions in so-called style, and we find at the present day a strong tendency to compress the accommodation of all kinds of architectural programmes into the rigid limitations of the almost completely symmetrical scheme (Figs. 129, 131).

This is particularly noticeable in domestic work, where the vogue of the symmetrical small house is enjoying a renewal of popularity, and the windows of scullery and coalshed brazenly balanced those of the drawing-room. The problem of plan composition in domestic work is fraught with pitfalls, and such devices for procuring absolute balance may be more or less legitimate, according to whether or no the effect aimed at is worthy of the ingenuity in manipulation required.

The small house plan is generally one in which the

guiding principle involved is that of 'Unity.' The subject naturally precludes monumental effects, and its simplicity suggests the discarding of conscious effort towards the splendid or the dramatic.

The characteristic of the domestic plan is the lack of the obvious 'Dominant,' which is the keynote to the majority of monumental lay-outs. The various departments of the small house are too close to each other in relation of importance to admit of the marked stressing of any one feature, living-rooms and service-rooms being almost equally vital. For this reason we find, both in plan and elevation, that the designer's main effort is concentrated on obtaining a simple unity of general form, which will contain within its harmonious lines all the small competing details which are framed in the domestic scheme (Fig. 135).

The more ambitious residence will tend towards more monumental effects, there will be more 'articulation' of the plan, a more marked external expression of main and subsidiary divisions, such as the master's portion of the house and the service wing. And, finally, we have the ambitious mansion, with an introduction of frankly monumental effects (Fig. 130). The plan composition will depend on the effect of formality and impressiveness desired, and if such effects are introduced in a building too small to justify them an impression of pompous pretentiousness may easily result.

It should be remembered that in domestic work, particularly of the smaller type, comfort and convenience must take precedence over effect. Planning on axial lines, with continuous vistas through doorways and windows, is apt to result in the provision of draughtiness as well as of impressive effect, and balance and order must not take

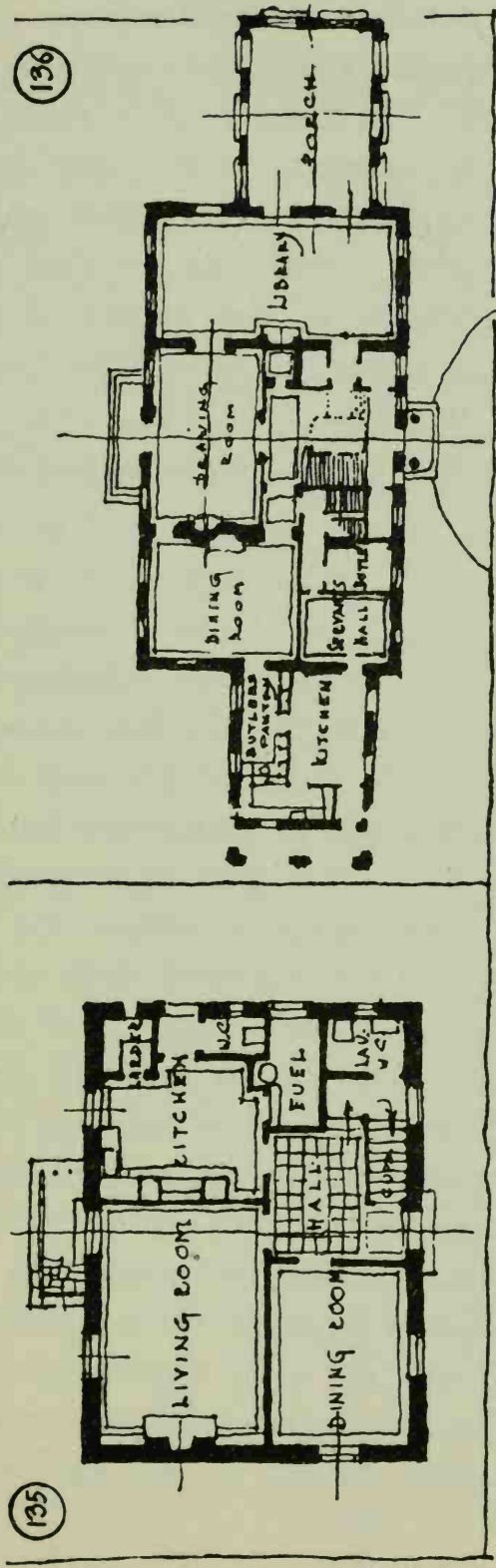


FIG. 135.—House at Hampstead, by C. H. James (Hennell and James). The present-day tendency in English small house design. Great economy of space ingeniously managed by creating balance to obtain a formal exterior. Tendency towards axiality.

FIG. 136. Eastover, Connecticut, U.S.A., by Charles Platt. Typical of the American formal manner. Well-studied balance and proportions, and general axiality.

precedence over such details as considerations of aspect, the proper location of fireplaces, and the provision of ample wall space for furniture. In French plan types, and in some American designs, custom often combines with climate to produce a fondness for the axial and formal scheme, but under English conditions we find in house planning a logical expression of the nature of our own particular domestic programme. The typical examples of domestic plans shown in Figs. 132, 134, 135, 136, are suggestive of characteristic types, which admit of infinite varieties of expression.

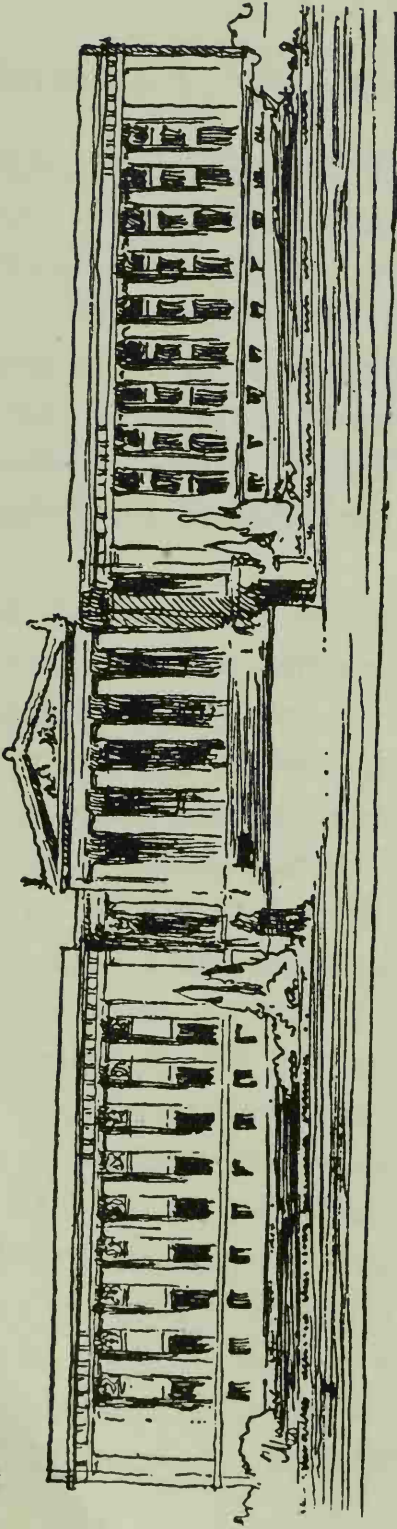
The Relation between Plan and Elevation

THE point that architectural design is essentially three dimensional in character has already been stressed, and since we are dealing with solids, the internal forms, of which the elevations are merely the envelope, are bound to find some expression on the exterior. An analogy is that between the covering of the body and its internal structure and organs, which, while not expressed in detail on the exterior, dictate nevertheless the general contours of the human form.

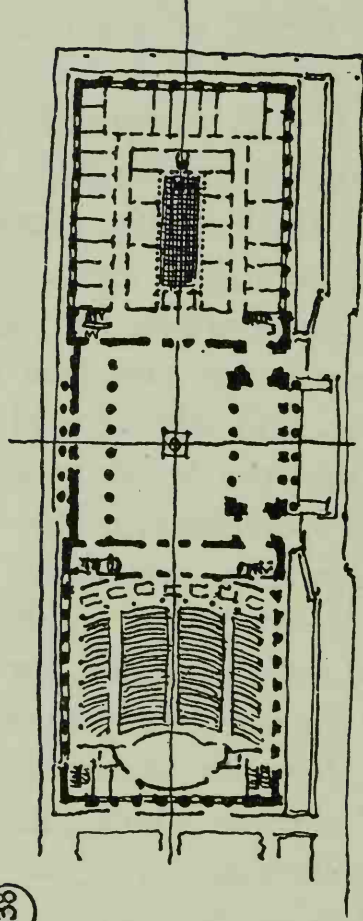
The degree in which the elements of the plan will find visible expression in elevation is a matter for the architect to determine, and will depend on the impression which it is desired that the building should convey, and upon the interest and worthiness of the various internal elements to obtain recognition externally. If certain features of the plan are not worthy of emphasis, it is undesirable to call attention to their presence, for it is paying but a poor compliment to the spectator to present to him an expression of the trivial, however meritorious may be the conscientious honesty of purpose which prompts this relation of fact.

The whole question of the treatment of elevations, and their relation to the plan, is intimately bound up with the standard of restraint or assertiveness to which it is desired that the design of the building should attain (Fig. 139), and with the building's duty to the 'social order' of the buildings and surroundings with which it is related. In the same way as a certain standard of conduct and

137

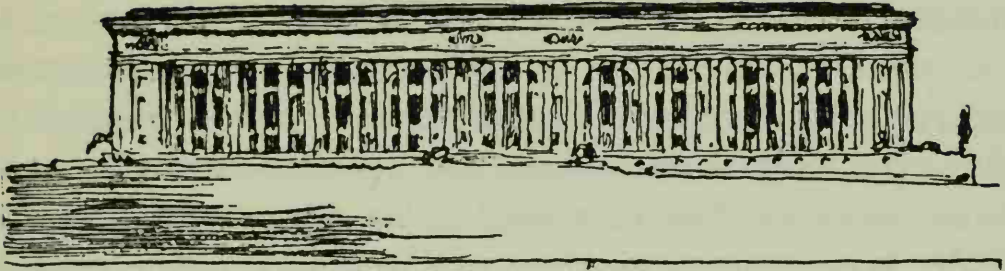


138



FIGS. 137 and 138.—Elevation and plan of winning design for the Tennessee Memorial by McKim, Mead and White. Note the variations in the plans of the two wings, and the frank expression of these in the elevation. The balance of the composition is preserved by the maintenance of the running Order in each, while at the same time the fenestration gives truthful expression to the internal requirements of the planning.

(139)



(140)



FIG. 139.—The New York State Education Building, Albany, by Palmer and Hornbostel. Here the façade takes the form of a screen behind which occurs the fenestration required for the various divisions of the plan. Expression of individual apartments is subordinated to the dominating idea of a highly monumental effect. FIG. 140.—Design for an Art Gallery by Easton and Robertson. Normal fenestration is here not desired, and the elevation expresses the requirements of the art gallery plan type.

department is required of the individual in any civilized State, so is it incumbent for the design of a building to maintain a degree of public propriety and good manners. Cases may arise where individuality in design may have to be restrained for the sake of fulfilling the function of forming a link in some general scheme, and it must be remembered that the emphasis and expression of character desirable in a design cannot be adequately determined without full consideration of the effect in relation to surroundings, whether they be other buildings or natural features.

The architect who designs a bold and striking building which jars on the general setting may be showing his personal ability, but at the same time lays himself open to a charge of bad manners in architecture.

There are apt to be, therefore, definite limiting restrictions on free expression, but one must assume for the purposes of discussion that these are for the moment in abeyance, and that the architect finds himself at liberty to determine to what extent the various elements, divisions, and functions of the plan should be expressed in the design of the façade. Under these conditions, one of the primary determining factors in the design of the elevations will undoubtedly

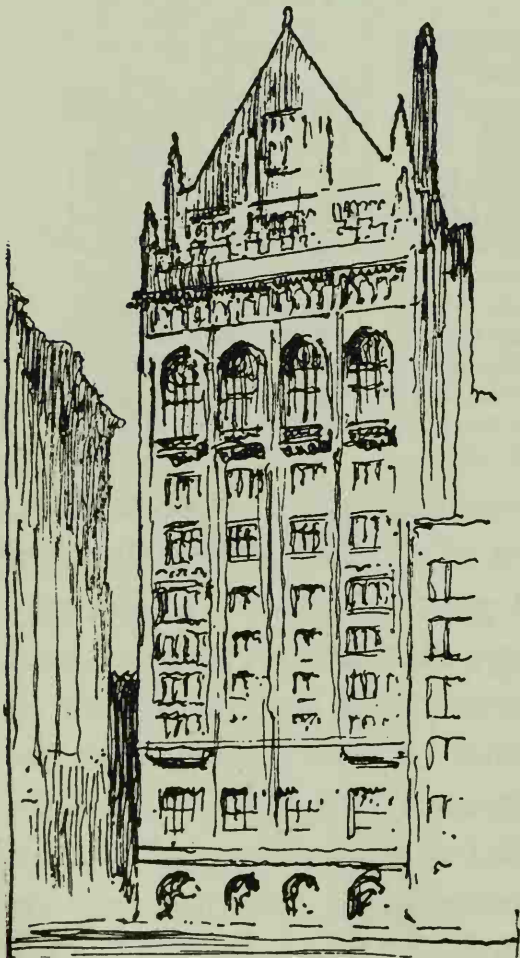


FIG. 141.—The University Club, Chicago, by Holabird and Roche. Note the expression in elevation of the large and lofty dining-hall on the eighth floor. The collegiate Gothic treatment and the handling of the fenestration marks the expression as other than that of the usual office building.

be the desire to convey a definite expression of the purpose of the building, since the *raison d'être* of any creation makes a human and interesting appeal, second only to that of sheer abstract beauty of design. It is therefore of the utmost value to endeavour to blend this expression of purpose with the effort towards production of beauty of form, thus endowing the satisfactory form with the vitality which character supplies. It is the function of the building which primarily dictates the plan (Figs. 137, 138, 146, 150), and if, therefore, we express this function in elevation, we are indirectly expressing the

plan, and implication of purpose often reveals the essence of the building more than does a literal expression of details of structure.

A building, for example, which is treated on its exterior elevations with blank walls devoid of window openings at once conveys the suggestion that its interior must be lighted either from the roof or by internal courts. This conclusion suggests to the architect a general impression of the type of plan involved, the type with which in his experience such systems of lighting are associated. He will conclude, in addition, that a building planned on such lines must be destined for some particular and special function, and for the key to the designation he will look to the character of the elevations and any characteristic and descriptive details which are employed in their working out (Figs. 140, 143).

The elevations of a building of this character may therefore be thoroughly suggestive of the planning, while at the same time failing to reveal much of the internal details of arrangement. These latter may, in fact, be so disposed that the most interesting and appropriate elevation takes the form of an architectural screen; such a treatment might occur in the design of a prison, where the suggestion of sub-division into rooms and cells is not elevationally interesting, and the whole is marked by a screen wall treated in the appropriate note of character.

It is in the case of plans which contain characteristic and important elements that it is particularly interesting to find the recall of these in the façade treatment. Large rooms and halls may be of such height that their roof covering will appear on the elevation in the form of domes, gables, or attic stories, while the position on the plan may

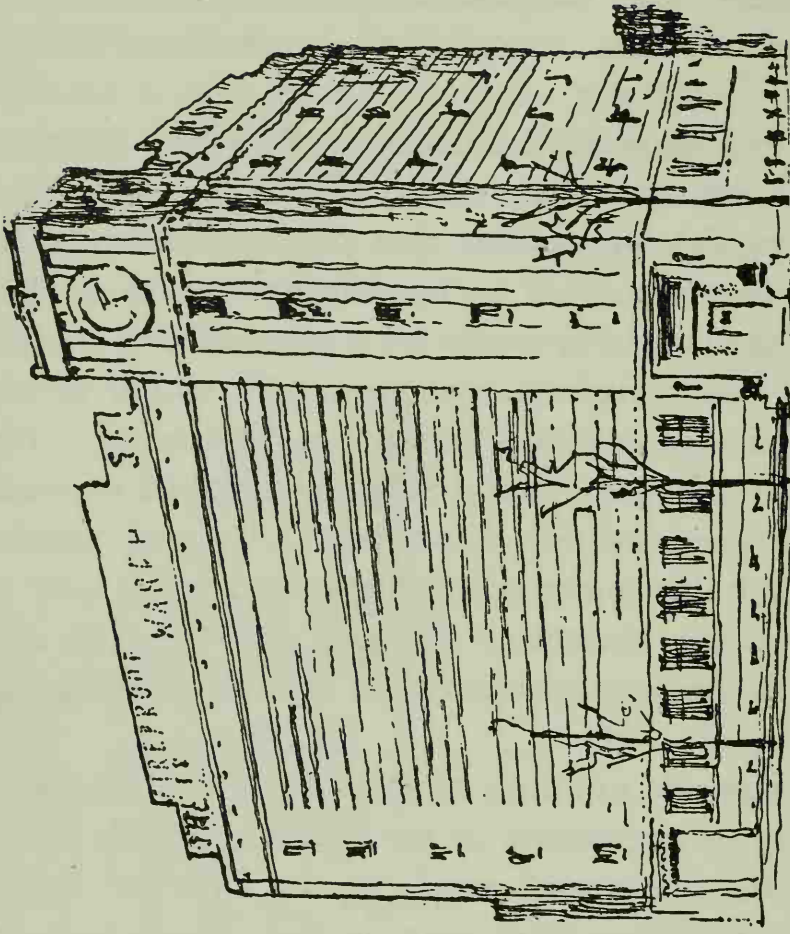


FIG. 143.

A furniture storage warehouse in Chicago, by Ottenheimer, Stern and Reichert. Expression of planning and function is here obvious and direct, and the absence of normal fenestration has been frankly accepted, interest being legitimately obtained by surface treatment.

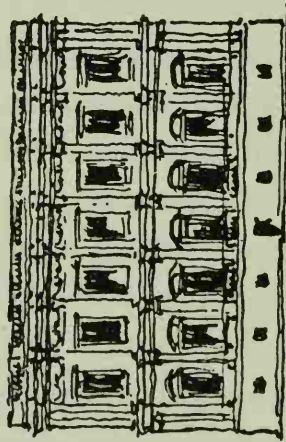
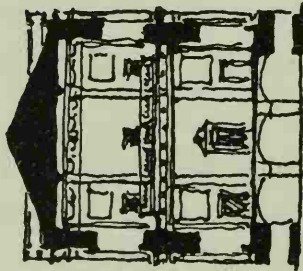
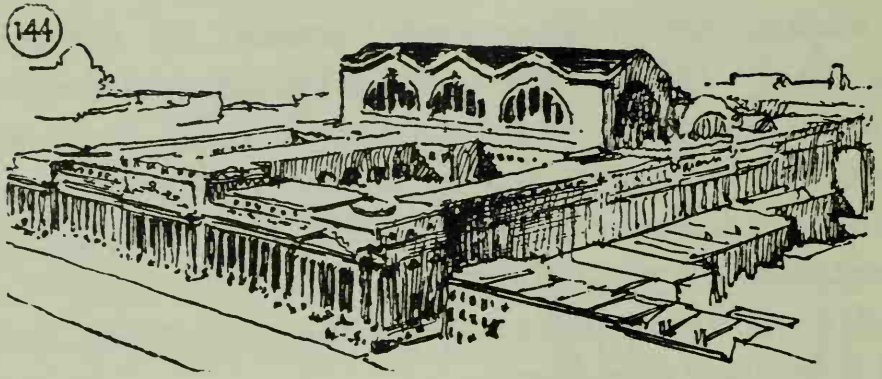


FIG. 142.—The Banqueting House, Whitehall, by Inigo Jones. The reproach is often made that the hall is screened behind an elevation which expresses a two-storied interior. The presence of the gallery largely justifies, however, the scheme of fenestration adopted.

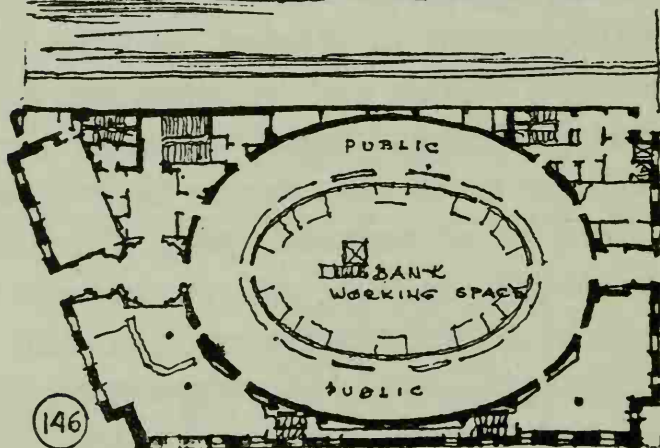
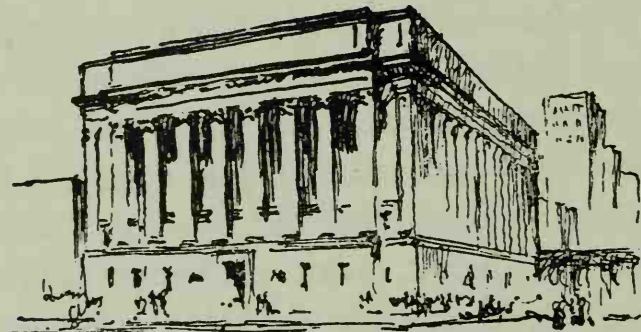
be marked by corresponding 'breaks' on the elevation (Fig. 144). In other words, the articulation of the plan, the division into main and subsidiary groups, may be most appropriately emphasized by an articulation of the planes of the façade, expressed by breaks of various importance accompanied by variations in height necessary to obtain good proportions and complete the idea of the dominant and subsidiary expression.

The portion of the elevation corresponding with some principal element of the plan will be appropriately richer in treatment and in general accentuation. More simply and monotonously treated portions will correspond with internal corridors and connecting links of the plan, and minor emphasis will convey the presence of secondary, but nevertheless important, plan elements (Figs. 149, 150). Emphasized expression on elevation will not be conceded to plan details lacking in interest, and the good planner will have assisted to this end by aiming to place these in inconspicuous positions. Series of small service rooms, lavatories, etc., in those cases where their presence on the building's front is necessitated, will, if possible, not be placed in a central position, and an attempt to proclaim their presence by an honest expression of their modest and sometimes even mean function will probably be less satisfactory than an external treatment which includes them as a unit or incident in some general broad scheme appropriate to the general scale and character of the building. The provision of lavatory windows as an architectural feature in the base of a monumental pylon flanking a main entrance is an extreme case in point. The lavatory should have been placed elsewhere on the plan, but once its position is accepted, it would be more desirable to blend its windows



144

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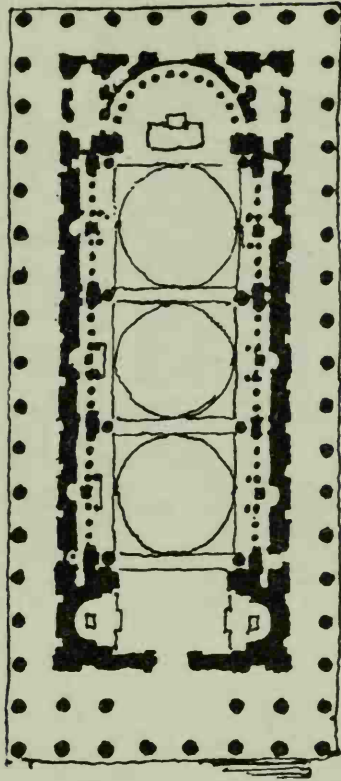


146

FIG. 144.—The Pennsylvania Railroad Station, New York, by McKim, Mead and White. Note the expression in the elevation of the main waiting-hall, rising above the roofs of the subsidiary plan elements. The desire for monumental effect makes this treatment practicable, and it is logically expressed.

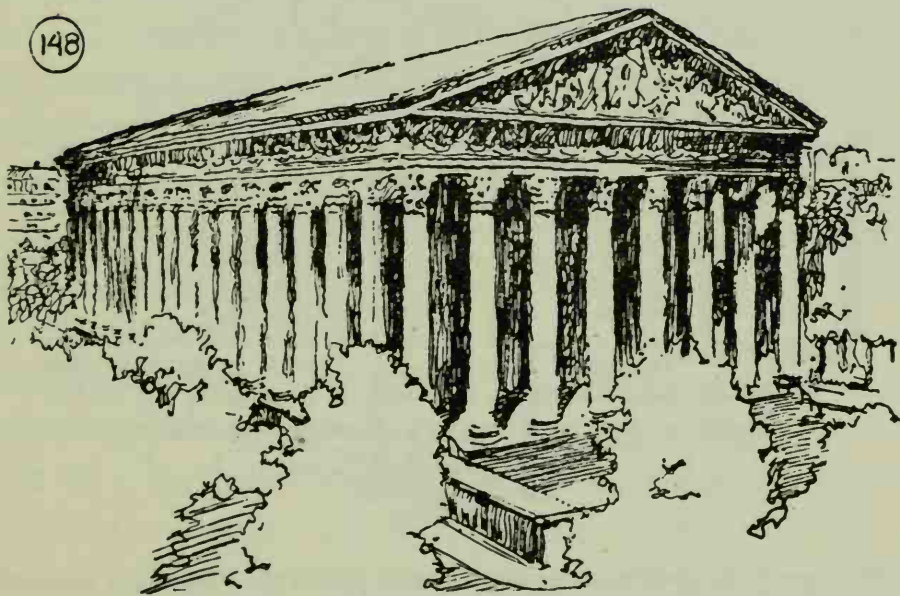
FIGS. 145 and 146.—Elevation and plan of Greenwich Savings Bank Building in New York, by York and Sawyer. In this case the exterior does not express the elliptical banking-hall, which dominates the plan. Such expression as might have been obtained was probably not considered to be worth the sacrifices in other ways involved, but the building would undoubtedly have gained in elevational interest if the unusual internal shaping could have been used as the keynote to the exterior design.

(135)

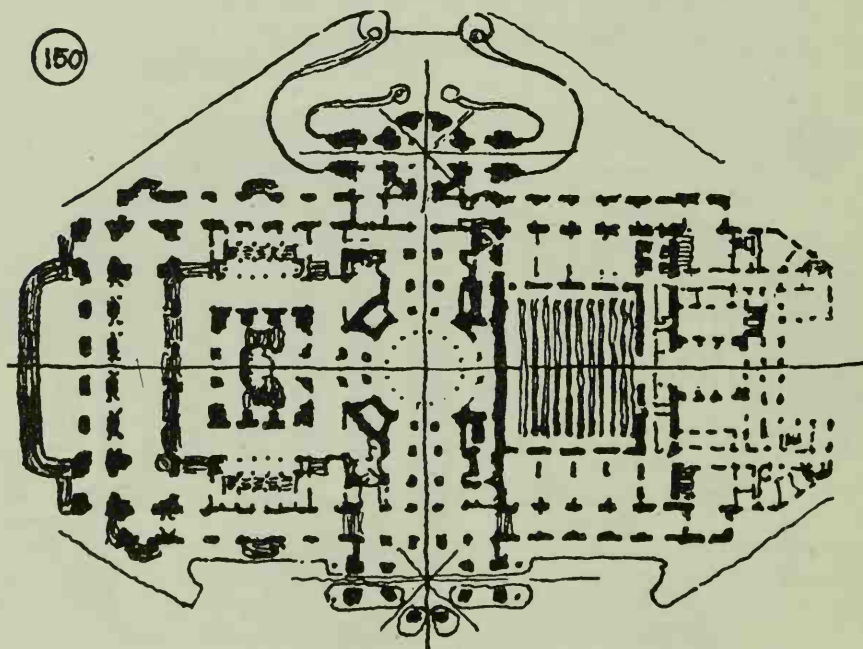
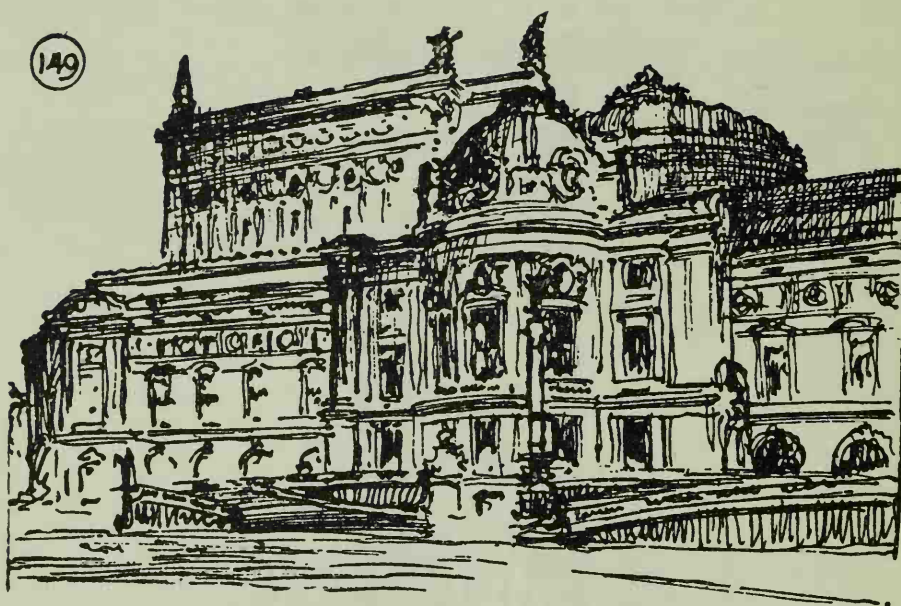


147

148



FIGS. 147 and 148.—Plan and elevation of the Church of the Madeleine, Paris. This is an instance often cited of false expression of plan in elevation. The three main domed compartments of the interior and the apsidal end suggest a façade of far greater interest than that revealed by the conventional Neo-Roman temple treatment.



FIGS. 149 and 150.—Side elevation and ground plan of the Paris Opera House, by Charles Garnier. This is one of the most beautifully studied plans of any comparatively modern building, and its various elements are clearly articulated and marked in the elevations, so that the main planning divisions can readily be perceived without entering the building.

in the decorative scheme than to express them as features in themselves worthy of emphasis as points of interest.

The attempt to express staircases in elevation often presents difficulties. Staircases have the peculiarity of breaking the line of floor and window levels, requiring, as they often do, openings providing light at intermediate landing levels. Their external expression therefore presents a problem and at the same time an opportunity for development into features of strong architectural interest.

The emphasis given depends on the general plan scheme, and their position on plan will be decided, having always in mind the elevational possibilities. They may be expressed, for example, as strong vertical motives, or with ramping lines following the head of the 'going,' or their expression may be suppressed behind a screen wall which has a window treatment precisely similar to that of some adjoining element of utterly different function, such as a room. To make of the staircase treatment the main motive of a monumental building is to run the risk of over-emphasizing what is after all more a practical necessity than the keynote of a conception (Fig. 151). On the other hand, a cleverly handled treatment may supply an emphasis which is just what is required to heighten a rather moderate general interest.

Should, however, the façade consist of an ordered rhythm of regular openings, it would not be worth while to interrupt it out of a quixotic desire to provide an honest expression of the staircase, and the fact that a landing happens to cut across a window is less damaging than the destruction of the unity of the façade conception.

Expression of plan in elevation may be carried to absurd lengths. It is a common failing, for instance, to stress

unduly the height of a hall which is an important plan element, in order to make its location more evident by showing its roof and upper part on elevation. If the hall is required to be low, for acoustical or other reasons, to attempt an expression of loftiness is quite illogical. The mere presence of importance of bulk and position cannot

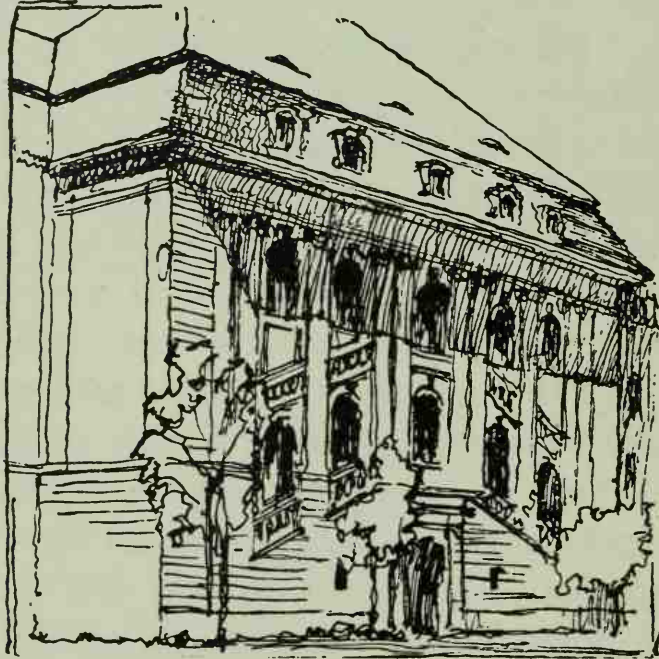


FIG. 151.—The main block of the Virchow Hospital, Berlin, by Ludwig Hoffmann. An honest and interesting attempt to express a main staircase in elevation. It is, however, open to question whether the resulting elevational disturbance is justified by the importance of the element expressed, which is not in this case dominating the building's conception, and is not perhaps sufficiently interesting to call for such strong emphasis.

always be directly indicated in façade; an instance occurs in the new building for the Port of London Authority (Fig. 122), where the presence of the huge circular Rates Department, the focus of the plan, can only be indicated elevationally by the emphasis of the corresponding entrance block on the main front. It would have been absurd to have

forced the dome of the Rates Hall up to the height necessary for dominating the elevation.

We may conclude, in considering the expression of plan in elevation, that it is desirable to express important features of the plan in the measure that such expression appears of interest either in emphasizing the purpose of the building or in providing elevational elements which by proportion, shape, contrast, etc., contribute to the general plastic and detail beauty of the design. Truthfulness, alone, while a virtue in the abstract sense, may result in that misguided conscientiousness which insists on the expression of those things which, architecturally considered, are better left unsaid.

The Expression of Function

IN concluding our consideration of the main principles of composition, it is appropriate to touch in a very general way on the difficult question of suitable architectural expression for buildings devoted to various purposes, a question which is, to a certain extent, independent of rules of abstract composition.

Whether or no a building may be considered to express its purpose is a question which may be answered with a degree of decision depending only on the reliability of human judgment. There is here no fixed and unalterable standard of appreciation, but rather a crystallization of opinion, which, accepted to-day as final, may be to-morrow rejected.

To the architect, as to the average man, certain buildings in our streets clearly suggest their functions, but very largely because they express function in terms which, through custom and repetition, have become a common language. A town hall, a museum, a railway station, a factory, all may more or less conform in their design to an accepted expression of buildings of these categories, and departures from the accepted type may tend to make their expression of purpose less generally understood. To the average man a building which 'looks like a museum' is a building which reminds him of some other building previously seen, and which he knows to be a museum.

We see, therefore, the possibility of a definite tendency to produce design of a certain type in order that the canon of expression may be obviously fulfilled, and public

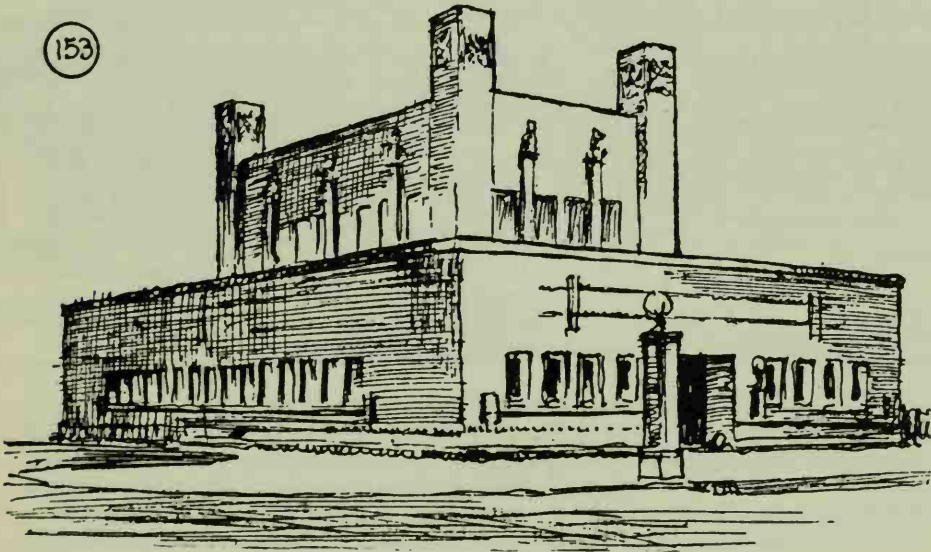
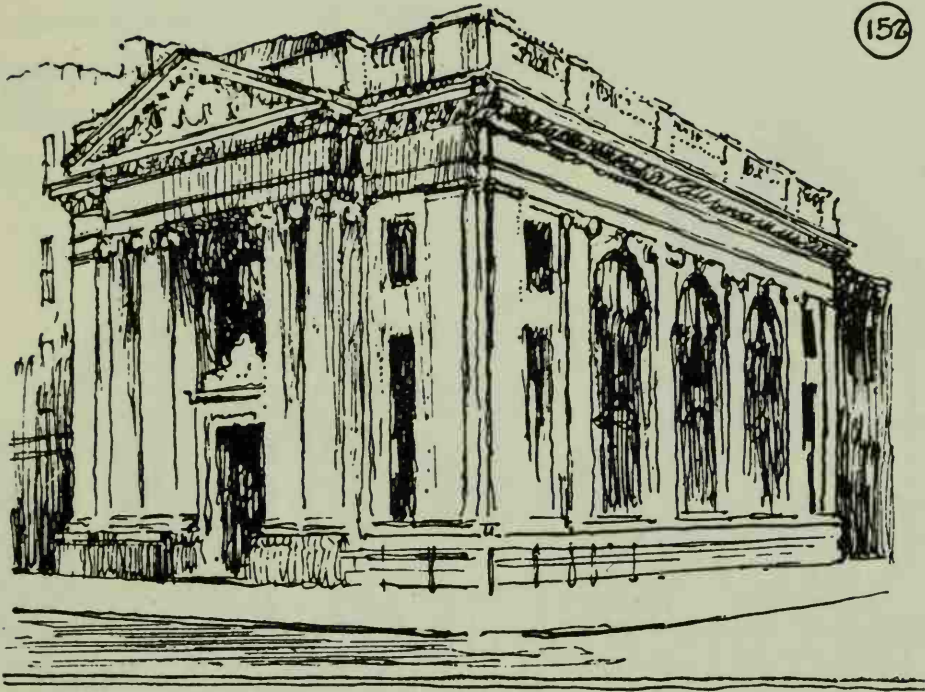
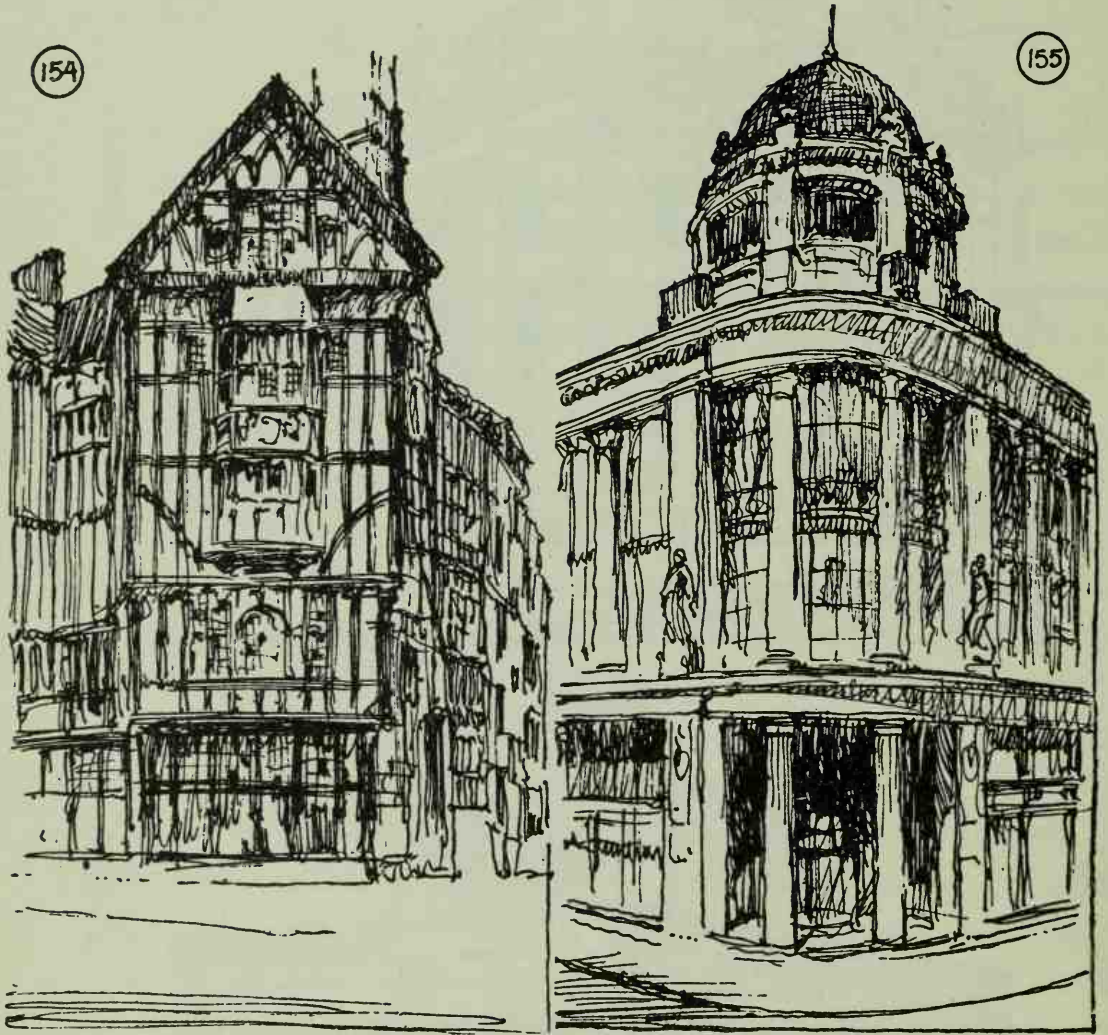


FIG. 152.—A typical American bank building, the First National Bank, Hoboken, by Kenneth Murchison. This type is dignified and well handled, but contributes little to the progress of architectural design.

FIG. 153.—The People's Savings Bank of Cedar Rapids, Iowa, by Louis H. Sullivan. This building breaks away from tradition, and is a straightforward solution of the particular conditions affecting the design. It is by no means completely satisfactory, but is vital and interesting.



FIGS. 154 and 155.—Two modern shops in stylistic character. Tudor House, Argyll Place, London, by Edwin T. and E. Stanley Hall, and Whiteley's Stores, London, by Belcher and Joass. The former building has adopted a sixteenth-century expression, considered the most appropriate for the business of the clients. The latter is a large general departmental store, Both buildings are built of modern fireproof construction, and both have a surface treatment applied to the structure, and in this are equally conventional. The convention merely differs according to the expression of character desired.

appreciation gained through the appeal to the average level of understanding. A good example of this occurs in the stereotyped designs for American bank buildings, a large number of which are based on a similar classical 'motif' (Fig. 152). The result may well be a certain stagnation

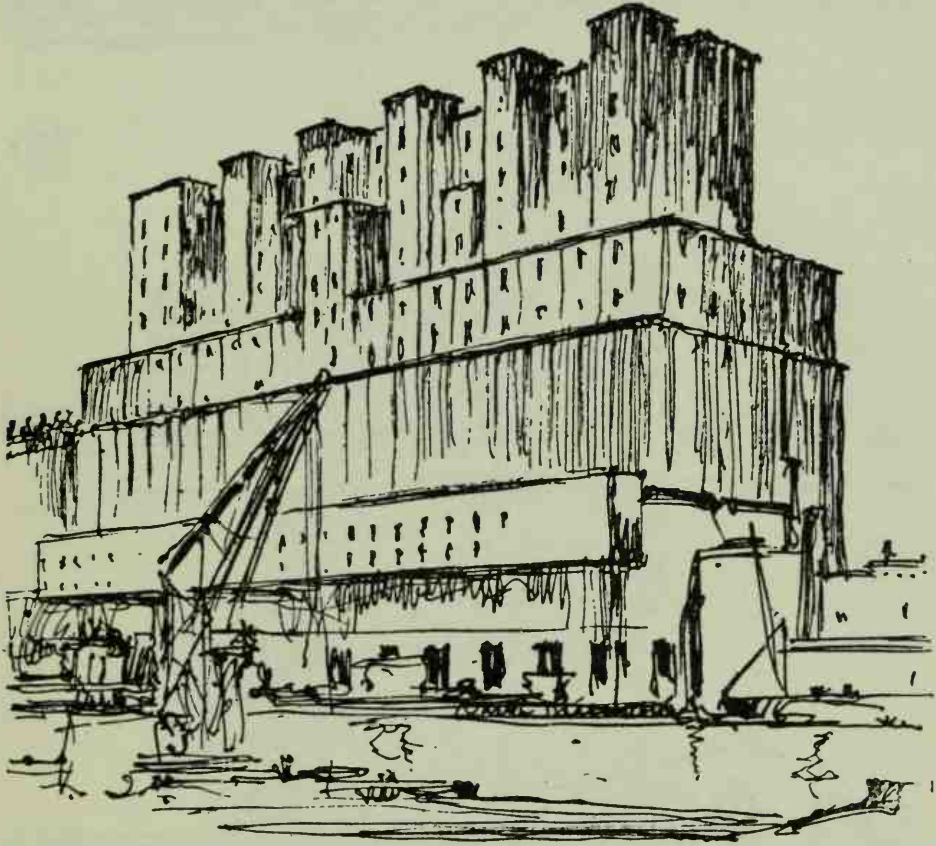
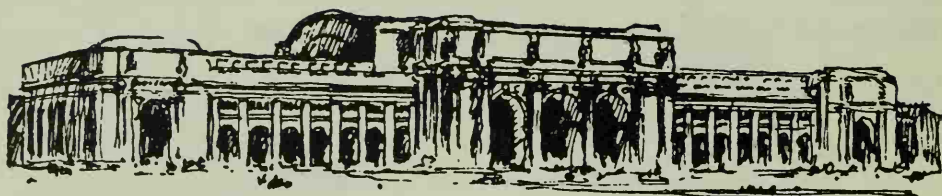


Fig. 156.—A reinforced concrete grain elevator at Montreal. This structure shows the immense possibilities of interesting handling of simple materials and forms. The design is absolutely functional, but skill and knowledge are evidenced in the handling of the resulting masses.

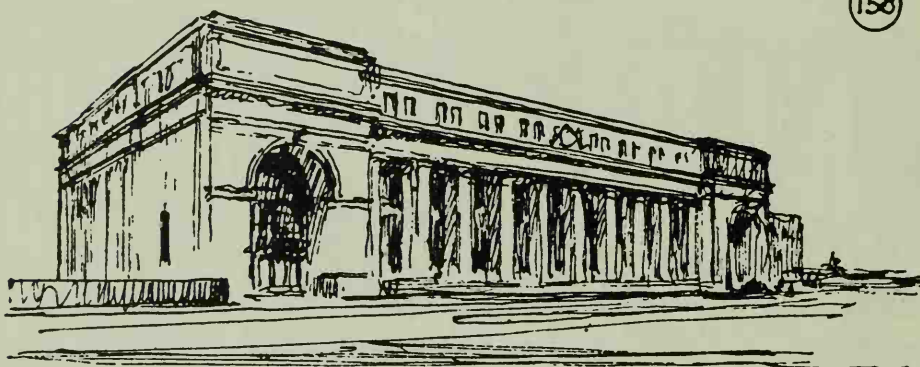
and lack of enterprise, with creative imagination given full rein only in those types of building which are typically modern creations and cannot depend on precedent.

Inability to give fresh and interesting expression to modern architectural problems is largely fostered by what

157



158



159

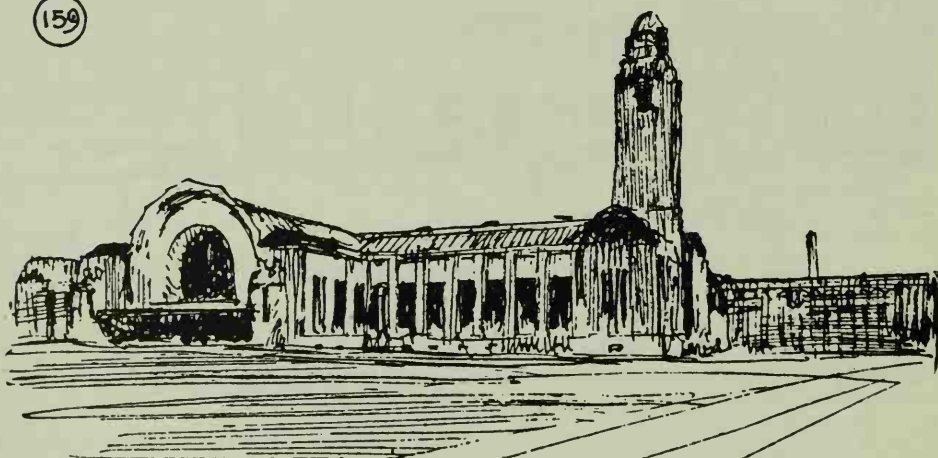


FIG. 157.—The Union Station at Washington, by D. H. Burnham & Co., architects.

A modern building treated in the antique imperial manner.

FIG. 158.—The Great Northern Station at Minneapolis, by Charles Frost. This building is an excellent essay in classic design, and has, like the Union Station, a fine civic character. But it might serve almost equally well as a design for a post office in the 'official' style of the larger American cities.

FIG. 159.—Helsingfors Railway Station, by Eliel Saarinen. A praiseworthy attempt at an expression both functional and national. This big building has the civic quality combined with vitality in design.

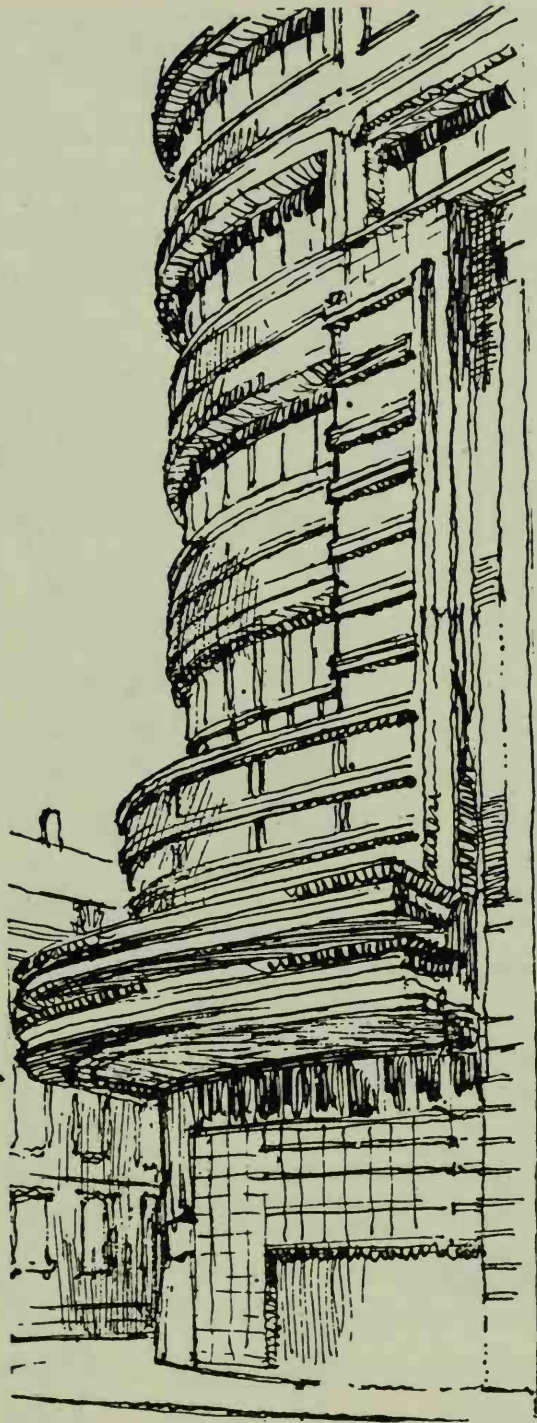


FIG. 160.—Building for the offices of the *Berliner Tageblatt*, by Erich Mendelsohn. An essay in the most modern German manner, designed to express the function and construction of an important office building, but suffering from over-emphasis and coarseness of handling.

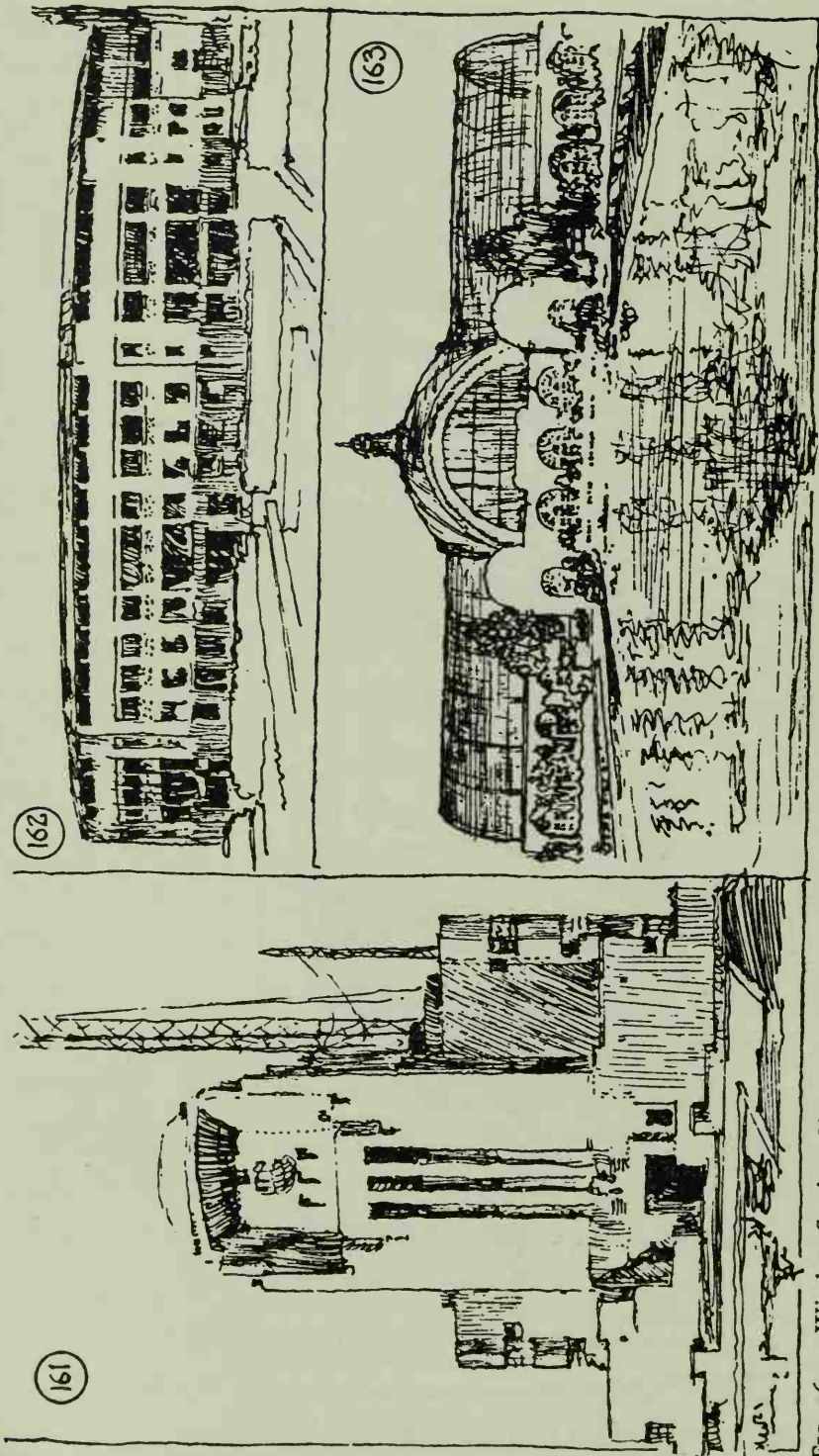


FIG. 161.—Wireless Station, Kootwyk, Holland, by J. M. Luthman. An expressive and interesting concrete structure, designed in sympathy with its material.
FIG. 162.—The Centre Court Lawn Tennis Stand at Wimbledon, by Stanley Peach. An honest and expressive concrete treatment showing the architectural possibilities of the most utilitarian structures.
FIG. 163.—The Botanical Building, San Diego Exposition (Bertram Goodhue, advisory and consulting architect). This building shows straightforward expression of function, satisfactory because of good massing and frankness of treatment.

is mistakenly termed 'respect of tradition' and 'love of old work,' and buildings revealing an anæmic adaptation of motives used 2,000 years ago under totally different conditions are dignified as 'scholarly.' Failure to achieve a vital expression is, however, much less excusable in buildings which have no prototype in antiquity, for engineering science, and the novel plan forms arising in modern problems, give the clue to design which may be as satisfactory in composition as any Roman thermæ, and yet entirely fresh in character and expression.

Even in such 'young' countries as the United States, architects are only now emerging from that stage of architectural expression which was content to see every new building disguised under the cloak of some ancient form. One cannot but feel regret for the lost opportunity of progress exemplified by the exterior treatment of such essentially modern buildings as the Pennsylvania railway terminals in New York and Washington, and the Great Northern Railway Station at Minneapolis (Figs. 144, 157, and 158). These designs are admirable studies in the antique manner, but make a much less suggestive contribution towards creative design than does the Finnish solution of a similar problem (Fig. 159).

In what the expression of modern buildings will consist is the task of the architect to determine, but it will certainly be affected by the materials employed, limitations of cost, and the ability of the designer to depend on fundamentals of composition rather than on the appeal of superficial mannerisms. The test of a good building will remain its suitability for its purpose, and its general treatment in the most beautiful and interesting manner possible.

At the present time (largely, perhaps, as a result of the

war), many new schools of architectural thought are in process of formation, producing results varying in interest and degree of success. We illustrate (Figs. 153, 160-163) designs for various types of buildings which reveal, at the very least, a real effort to express a purpose and an idea. These buildings are the outcome of the natural revolt against copyism, and represent a logical stage in the art of architecture, which is essentially an art of evolution. No art in which fundamentals are submerged in the accessories of style and fashion can be in a healthy state, and it is under such conditions that a natural reaction sets in.

Whether the resultant opportunity to progress can be seized by the architect depends on native ability properly developed by a training which aims at idealism rather than materialism, and with which is coupled the stimulus of an increased demand on the part of the public for a living architecture.

XII

Appendix

HINTS TO STUDENTS ON THE ARCHITECTURAL PROGRAMME AND A METHOD OF WORKING

ONE of the greatest assets to any student who is commencing the study of an architectural problem is a knowledge of a method of working which will enable him to approach the task with a maximum of clarity and the least expense in wasted time.

Lack of system is often the result of inexperience, but more often it is due to a failure to consider the organization of one's mind as of equal or even greater importance than technical knowledge and dexterity. Many a brilliant scheme fails because of insufficient examination of the problem which it is intended to solve, or because the student has been too rapidly carried away by the ardour of architectural conception.

Many architects are the fortunate masters of a definite system of procedure, and are in a position to impart valuable hints on the subject, but few of these hints have ever been put down in black and white. It is our object to summarize some of these suggestions, which are put in the form in which it is believed they will be of most help to the student.

It is presumed that the programme has been properly written, with a general introduction explaining the requirements of the promoters, followed by a more detailed schedule of accommodation.

THE PROGRAMME AND ITS ANALYSIS

The primary intention of the drafter of the programme is to give a clear idea of the problem which the promoters offer for solution. The promoters are in the position of persons with an open mind who desire a building with a certain accommodation, within certain defined limitations, and who are enquiring as to the best form in which the desiderata may be obtained. Programmes should not be written around a preconceived solution, but should, of course, be capable of solution. A solution must be worked out roughly by the person who drafts the programme, but such solution should not be indicated directly or by implication. A good programme never contains any 'catch,' at any rate intentional.

READING THE PROGRAMME

(a) The general 'atmosphere' of the programme should be absorbed, and from this an opinion formed of the character, quality, and type of the buildings which the promoters have in mind.

(b) Note particulars of site, limitations, surroundings, and considerations of access.

(c) Note the general accommodation required and its relation to the site available.

WORKING OUT THE PROGRAMME

This involves a mental process, which is that of the receiving of an impression of the intentions of the programme. If the programme is well written, this impression should be fairly clear.

(a) A mental note should be made of the more important restrictions or difficulties, such as levels, etc., and any special desiderata.

(b) The requirements of the accommodation should be dissected:—

(1) The principal elements in their conjectured order of importance.

(2) The obviously secondary elements.

These items of the accommodation may be placed in two parallel columns, the major elements on the left and the secondary elements on the right. As far as possible each secondary element to be placed opposite to the major element to which it will be related. This will enable a preliminary idea to be formed of the order in which these elements will appear on the plan.

It will then be advisable to take tracing paper and set to work over the site plan *at small scale* to sketch out the building. The main elements should be placed in their most logical positions, it being probable that the most important element will occupy the climax or focal point of the plan.

After the main elements have been placed, the blank spaces remaining will show what areas remain available round these elements for services, circulations, etc., and these may be filled in, each in the relation to the element to which it is attached in the parallel schedules of accommodation.

WHERE THE SUBJECT IS A LARGE COMPOSITION
CONSISTING OF GROUPS OF BUILDINGS, ETC.

The procedure is the same, except that in this case it is probable that certain areas of accommodation will have been given in super feet. This will assist in the obtaining of a grouping.

These approximate areas being given, or having been worked out, a good method is to plot them out in geometrical shapes on stiff toned or coloured paper, and then cut them

out, so that they can be used as the component parts of a 'puzzle.' The various 'pieces' can then be placed on the site plan, and their position varied until a satisfactory working grouping has been found, when they can be gummed down. They will then form the elements of the composition, around which can be worked in pencil the secondary elements and services. This method will save much labour, but it should always be followed to a *small scale*.

ELEVATIONS

A finely grouped plan will always provide the possibilities for a sound if not always brilliant elevation. It is probable that the plan will have to be modified in details for elevational reasons, and there are schemes in which the elevation really provides the problem, and the plan is of secondary importance, as in certain decorative subjects where the façade is the primary consideration. These latter may be termed 'elevational subjects.'

ELEVATIONAL SUBJECT

In such a matter there must be specially considered:

- (a) The position, and how the building will be seen (*e.g.*, in an open square, a narrow street, as climax to a vista, etc., surrounded by high or horizontal buildings, etc.).
- (b) The character required, the expression (*e.g.*, festive, dignified, public, intimate, etc.).

The elevational problem should be treated in principle in the same way as the planning problem. The dominant feature or idea of the programme should be the climax or focal point.

The masses should be sketched in, with a very soft pencil, the secondary masses being used to give scale to and *enhance the effect* of the principal elements. The details should not be studied at this stage.

(a) Group the masses in elevation to a small scale.

(b) Prepare 'thumbnail' perspective sketches of the design in its setting as completely as the whole ensemble can be imagined.

(c) When satisfied with the general scheme, after modification and selection of main grouping, the secondary and detail elements can be suggested in their accompaniment to the structural masses.

In considering the preliminary massing, one should always work with the effects of light and shade, thus expressing the differences of plane, and with those of solid and void. Shadows should be sketched in with their 'values' as true as possible, and window and door openings *blacked* in solid. It is very easy to deceive oneself by indications of details such as glazing bars, etc., which at small scale produce an effect in line more important than in reality. And while shadows which one does not desire to appear may be kept faint on a drawing, they will have their true weight in the finished building, and must be fairly considered.

CHECKING THE PRELIMINARY STUDY

One of the easiest traps in which to fall is the falsification of scale, *i.e.*, the causing of a building to appear, owing to its design and detail, to be of a dimension either greater or smaller than its appropriate reality.

It is vitally important, therefore, after a rough sketch has been prepared, that a scale should be put to floor heights, doors, windows, steps, balustrades, etc., to make certain that these are neither impossibly large nor small in their relationship to the building and the human scale.

WORKING UP THE ROUGH SKETCH

In developing the rough sketch the student should not pass to the finished scale until the problem is completely worked out in plan, section, and elevation, to a *small* scale. It is extremely difficult to grasp visually large-scale drawings, and the work of studying over them is increased by their size.

The various studies should be made on tracing paper, each sheet superimposed over the study beneath, so that there remains a record of all the processes of study leading to the final scheme. It is often found that good ideas in the first sketch have been lost in the process of alteration and rubbing out unless this method is adhered to.

The final sketch to small scale should be finished with the walls blacked in on plan, and the voids in elevation. The general effect can then be gauged before putting the scheme up to final large scale, which is simply a mechanical process.

In the study of plans and elevations which are completely symmetrical, it is useful to remember that it is necessary to draw only the one half of the scheme. By placing a sheet of mirror glass along the axis of symmetry, in a plane at right angles to the board, it is possible to procure the image of the complete composition, and much saving of time will be gained.

In conclusion it cannot be too strongly emphasized that in the study of design the student who grudges the use of pencils and tracing paper will prove to be penny wise and foolish to the tune of pounds of wasted effort.

XIII

Conclusion (1954)

THE most interesting developments of the last few years are in those buildings where the architect has felt the soul of his problem and has used his vision to express it. But the will to express is not alone sufficient. An expression, to be intelligible, must take a form; and form itself, to be perfected, demands a perception of beauty. This perception, at times inherent and instinctive, is deepened and enriched by the understanding of those principles which are found on analysis to be latent in all works of art. One of the fascinations of the study of painting, as conveyed through a master critical mind (such as that of the late Roger Fry, for example) lies in the constant expectation that there will be revealed the key to that approach to creation which results in masterpieces. The short and satisfactory answer to the 'Why is it a masterpiece?' will probably never be given. But it is quite certain that in all the arts the Masters of them have sought, and analysed, and are aware of principles which must first be understood and absorbed before they can be conveniently relegated to the subconscious.

No new departures in architectural thought have proved in the slightest way that the technique of composition is something which can be neglected. The best of contemporary design in building is that which is securely founded on a sure sense of form. To analyse such work is to find in

it many of the principles enunciated in this book; whereas an analysis of a bad imitation of modern work will show where the weakness lies. It lies in the ignorance or neglect of these principles.

Much knowledge, much experience, much sensibility, are required to express the simplest theme in speech, or writing, or music, or architecture. If there is one warning that can be given to the student of architecture, it is to beware of the apparently easy success of one's first essays in design based on the recollection of some other person's architectural idiom. The work of the early years in the design studio is nearly always more successful than that of the later years. It is because, in the first case, a measure of artistic instinct carries the student over the first hurdles. But later on he feels the lack of fundamental knowledge to guide and develop that germinating sense of design which may so easily be a flower without a root. It is then that discouragement sets in, and that the true struggle, from which even the genius is not exempt, begins.

The knowledge of what has gone before, a sense of tradition in fact, should prove the reverse of a handicap, provided it be prized for what it is, a treasure of experience on which to draw. Some of the most interesting architecture which is being produced to-day is coming from America, not in the handling of the problem of the skyscraper, which is a specialised theme, but in the rendering of more familiar problems, such as the house, the factory, or the office. In the domestic field in developing a fresh handling of old materials sometimes—but not always—blended with new. Wood, iron, stone, appear once more, but in forms which are novel because the point of view of the designer is focussed afresh; because he is seeing new facets to an old

problem. The gradual change in living expressed in the cult of the big living-space-cum-play room, the tendency towards building with some or all of the bedrooms on the ground floor, and the realisation—which Frank Lloyd Wright has so greatly helped to strengthen—that the siting of buildings has in too many cases only been cursorily studied, are combining to develop something like a new vernacular.

The younger American architects are finding that there are still a hundred fresh forms to be made with age-old materials. The European continent has stimulated them; but the expression to-day is native and natural, it is no longer an importation.

In this new American architecture—and it is by no means the only new architecture—it will be found that a sure sense of appropriate form still remains the keynote of success, that the fresh idea involves a skilful utilisation of principles of proportion, of contrast, of scale.

Much of this work shows, besides skill, knowledge, and technique, a real imagination coupled with a sophisticated awareness of the prevailing fashionable idiom of the moment. But it is not the idiom that will ultimately count, in fact it may eventually become a matter for lament. What gives this work importance is the fact that sentiment, romanticism or intriguing whimsicality is only an overlay to a very real and pervasive ability to handle design in a way which gives it kinship with all good architecture of other times and other places.

There is endless variety to be found in the treatment of simple and familiar material elements of architecture. Take for instance, the example of wrought-iron work. Here is a material which can convey a totally different message accord-

ing to the national traditions, and according to the individual craftsman working in that tradition. Italian, Spanish, French, Swedish, English, Swiss and German ironwork has each its characteristic stamp; and within the national framework are to be found an infinite personal richness and variety. The treatment of a window opening and its frame and sash is another element upon which the last word will never be said. One has only to see how, in an Irish white-washed cottage, such a simple idea as the bright colouring of the window reveals can profoundly modify the whole exterior effect, to realise that it is idle to suggest that any type of architecture has worked itself out; though this is a reproach which is to-day being levied at the advanced contemporary style. Designers may occasionally be sterile; but the cause of that may be that he who absorbs nothing has little to give out.

A study of the principles of composition, to be fully effective, should have its complement in a study of the use of materials of to-day and yesterday, not only as elements of structure but also in their relationship to site conditions, climate, and reaction to weather. Rightly used, a knowledge of composition and its practical applications will help their possessor to be a free and independent architect, one who is not afraid if necessary to run counter to prevailing fashion. For he will know that the basis of his design is something that is common language to all qualified observers, and his work will have its roots in a soil which is truly international and truly fertile.

Works of Reference

Note.—The number of works dealing with the theory of Architectural Composition is extremely limited. The following list, which does not pretend to be exhaustive, comprises books dealing directly with the subject or containing matter of interest to the student of composition. Books treating of æsthetics from the purely philosophical standpoint have not been included.

- 1759-1825. CIVIL ARCHITECTURE. Sir William Chambers.
 1847. ARCHITECTURAL MAXIMS AND THEORIES. T. L. Donaldson.
 1848-1852. ARCHITECTURAL PUBLICATION SOCIETY (giving references to ancient authors).
 1877. LECTURES ON ARCHITECTURE (Vol. I.—Lecture 9). Viollet-le-Duc.
 1878. GEOMETRY AND OPTICS OF ANCIENT ARCHITECTURE. Penntothorne.
 1879. THE SCIENCE OF TASTE. G.-L.
 1881. ENCYCLOPÆDIA OF ARCHITECTURE (Book III.). Gwilt.
 1893. HANDBUCH DER ARCHITEKTUR. Vol. IV., Section i.: 'Die Architektonische Composition.' Heinrich Wagner.
 *1904. ÉLÉMENTS ET THÉORIE DE L'ARCHITECTURE (4 vols.). J. Guadet.
 1907. ESSENTIALS IN ARCHITECTURE. John Belcher.
 1908. THE MISTRESS ART. R. Blomfield.
 *1908-1914. ARCHITECTURAL COMPOSITION. J. Beverley Robinson.
 1910. THE BEAUTIFUL NECESSITY. Claude Bragdon.
 1913. THE BEAUTIFUL. Vernon Lee.
 *1913. THE ESSENTIALS OF COMPOSITION. VAN Pelt.
 1914. THE ARCHITECTURE OF HUMANISM. Geoffrey Scott.
 1917-1921. THE LOGIC OF ARCHITECTURE (*The Architectural Association Journal*, Aug.-Nov., 1917, and Nov., 1921). Robert Atkinson.
 1920. COMPOSITION. A. W. Dow.
 1920. VISION AND DESIGN. Roger Fry.
 1921. SCIENCE AND THE INFINITE. Sidney T. Klein.
 1921. ARCHITECTURAL HERESIES OF A PAINTER. Roger Fry.
 1921. THE THINGS WHICH ARE SEEN. Trystan Edwards.
 *1923. ARCHITECTURAL COMPOSITION. N. C. Curtis.
 1923. AN INTRODUCTION TO THE THEORY OF ARCHITECTURE (*R.I.B.A. Journal*, Feb. 24, 1923). Lionel Budden.
 1929. SOUNDING STONES OF ARCHITECTURE. Philip N. Youtz.
 1933. ARCHITECTURAL DESIGN. F. Pickering.
 1936. THE NEW VISION. L. Moholy-Nagy and D. M. Hoffmann.
 1937. DESIGN. Professor Percy Nobbs.

* These books deal directly with Architectural Composition both in theory and practice, but from a functional rather than from an abstract standpoint.

Index

NOTE.—*Figures in Italics indicate a diagram and refer to the number of the PAGE on which it occurs.*

- A.A. Student's design, 19, 21
Accentuation: *see* Emphasis.
Æsthetic considerations, 1, 3, 40,
55
Allcock, E. T., 109
American architecture, modern,
143, 144, 147
See also under various Cities.
Amsterdam: Boating Club, 46
— National Theatre, 46
Angkor Vat: temple in Exhibi-
tion, 60, 61
Anti-climax, 111
Aqueducts, Roman, 67
Arc de Triomphe, Paris: its geo-
metric design, 84
— its scale enhanced by its setting,
97
Arcade: its geometric proportions,
81
Architectural Heresies of a Painter,
The, 44
Architecture as an evolutionary art,
148
Art Gallery, design for, 129, 131
Articulation of plan, 118, 124
— of façade, 133, 136
Assisi, S. Francesco, 21
Asymmetrical plans, 106, 120
— as due to site, 107, 121
Axiality of plan, 118, 121, 122, 125

Baker, Sir Herbert, 104
'Balance' in plan: its meaning,
103, 104, 107, 118, 120, 121,
128
— its natural use, 116, 123

Balustrades as test of scale, 98
Bartoloni Palace: geometrical pro-
portions, 81
Beautiful Necessity, The, viii, 82
Beauvais Cathedral: plan, 81
Beaux Arts designs, 101
Belcher, J., 92
Belcher and Joass, 142
Benoît, F., 78
Berkeley, California: house, 45
Berlin: hospital, 138
— *Tageblatt* offices, 145
Blow and Billerey, 93
Borghese Gardens, Rome: foun-
tain, 44, 48
Botanical Building, San Diego, 146
Bragdon, C., viii, 78
Breadth, how accentuated, 66, 69,
70
British Museum Extension, 66, 69
'Bull's-eye' windows as stops, 88,
90
Burnet, Sir J., 66, 69; 92
Burnham, D. H., 74, 144

Campanile competing with dome,
38, 39
Candelabrum, lines of, 27, 31
Carrère and Hastings, 72
Caryatides, 56, 57, 58, 81
'Casa d'Oro,' 21, 22
Cedar Rapids: bank, 141
Ceiling as 'tying in,' 12
'Centre of gravity' in composition,
19
Champs Elysées, theatre of the:
plan, 115, 119

- Charterhouse Memorial Chapel, 71
 Château: design for entrance, 89
 Châteaux: their roofs expressive,
 74, 76
 Chevening, Kent: façade, 88
 Chicago, *Tribune* building: design,
 47, 68
 — University Club, 130
 — Warehouse, 132
 Chiesa del Santo, Padua, 27, 31
 — dei Miracoli, Venice, 27, 31
 Cinema: façade, 95
 Climax: *see* Emphasis.
 Clock-dial, 90
 Columbia University: student's
 design, 20
 Columns, as logical, 43
 — as 'positive,' 53
 — as functional, 52, 55
 'Complementary' buildings, 15
 Composition, as capable of analysis,
 viii
 — its fundamental principle, 25
 Concrete villa: plan, 122
 Constantinople, S. Sophia: section,
 79
 Contour, 27, 31; 48
 Contrast, 26, 27, *et seq.*
 — of 'positive' and 'negative,' 53
 — of projections, 73
 — of elements of plan, 113
 Cooper, Sir E., 110
 Cornice, classic, 48, 49
 Corridors, 113
 — their treatment in elevations, 133
 County Hall, London, 107
 'Cour Ovale,' Fontainebleau: plan,
 115
 Criticism: its fundamentals, viii
 Cubley Village: plan, 104
 Cumnor: plan of house at, 118
 Curves, 50
 Darius, tomb of: plan, 79
 'Deanery Garden,' 87
 De Klerk, 46
 Delamarre, Roux-Spitz and, 63
 De Soissons and Wornum, 118
 Despradelle, 89
 Details, their handling, 77
 Doge's Palace, Venice, 10
 Dome as spoiling campanile, 38, 39
 — expressive in elevation, 131
 — in profile, 50
 Domestic buildings: their plan,
 118, 120, 123
 'Dominant,' the, 5
 — in materials, 36
 — in the Roman aqueduct, 67
 — in plans, 110-113
 — accentuated in façade, 134, 139
 — its absence felt in Kingsway, 13
 — cancelled by too great contrasts,
 39, 40
 — lacking in 'small house' plans,
 124
 Doors, their effect due to their set-
 ting, 11
 'Double cube' rooms, 12, 18
 'Double square' doorway, 18
 Duality, 6
 See also Unity.
 Dublin: Trinity College Chapel,
 31, 36
 Dutch architecture, modern, 46,
 47, 48; 54, 55; 146
 Easton and Robertson, 129
 Eastover, Connecticut: house, 125
 Edwards, Trystan: quoted, viii, 9,
 13, 15
 Einstein Tower, 42, 47
 Elements of plan: their treatment,
 113
 — their expression in elevations,
 127
 Elevations as expressive of function,
 127, 128, *et seq.*
 — should match their surround-
 ings, 152

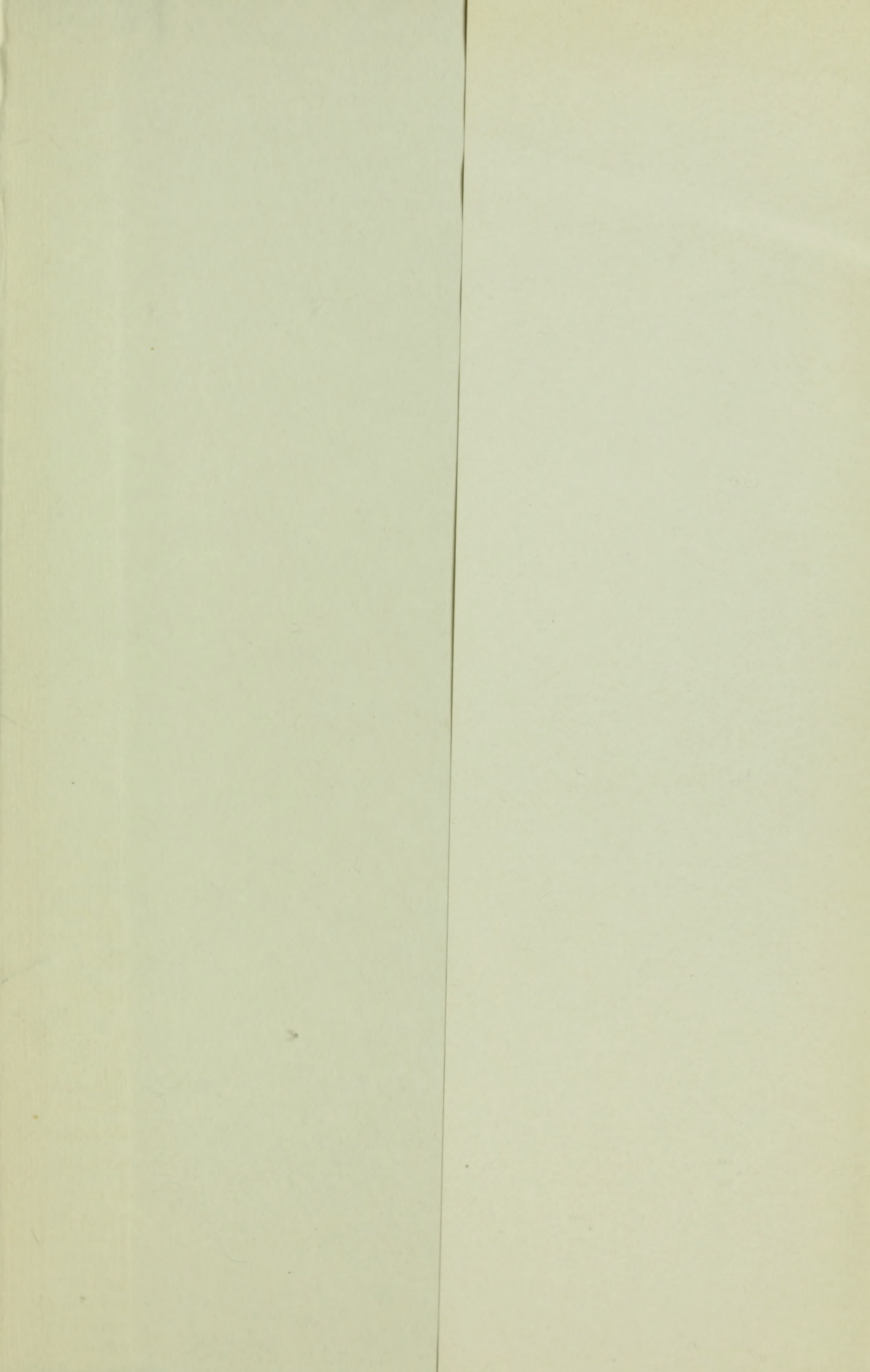
- Elevations inherent in plan, 152
 Elizabethan windows, 87, 88, 89
 Emphasis, 59, 60, *et seq.*
 — of elements in plan, 106, 107, *et seq.*
 — in façade, 133
 — as disturbing balance, 22
 English modern architecture criticised, 47; 97; 98
 — ‘small house’ plans, 126
 Entablature, Greek, 49
 Erechtheion, Caryatides of the, 81
Essentials in Architecture quoted, 92
 Expression of function by elevation, 72, 73, 75, 76; 127, 128; 140, 141, *et seq.*
- Falsification of scale, 92, 93, 95, 98; 153
 Farnese Palace, Rome, 30, 36
 Fenestration, 30-32, 36, 69, 72; 99
 See also Windows.
 Finnish Railway Station, 144, 147
 ‘Five Sisters’ windows, 69, 69
 Florence: Bartoloni Palace, 81
 — Riccardi Palace, 34, 36
 — S. Spirito, 84
 — Tomb of Lorenzo di Medici, 63
 Focal point of interest, 6, 18, 59, *et seq.*
 — of plan, 107, 108, 110
 Fontainebleau, ‘Cour Ovale,’ 115, 117
 — Grotto, 56, 57
 Fountain: silhouette, 44, 48
 French ‘small house’ plan, 126
 Frost, C., 144
 Fry, R.: quoted, 44
 Function: its external expression, 76, 127, 140, *et seq.*
 Functional design, 1-2
 Functional elements, examples of, 52, 55
- Garnier, C., 136
 Geometrical figures, 78
 — their contrasts, 39, 40
 — use and abuse in plan, 114
 Goodhue, B., 83, 146
 Goodwin, Bullard and Woolsey, 103
 Gothic Ornament, 57
 Goujon, J., 57
 Grain elevator, Montreal, 143
 ‘Grand Prix’ plan, 116
 Greek mouldings, 49
 Greek ornaments, modern misuse of, 98
 ‘Green Lawn,’ Long Island: roof, 74, 76
 Greenwich (N.Y.): Savings Bank, 134
 Gropius and Meyer, 47
 Grosvenor Street: house, 93
 Grotto at Fontainebleau, 56, 57
 Grouping of elements, 19, 30
 Guarda: inn sign, 44, 48
- Hall, E. T. and E. S., 142
 Halls, their emphasis in façade, 138
 Hampstead house: plan, 125
 Hampton Court: window, 88, 90
 Heal’s shop: window, 72, 75-76
 Helder, the, 42, 47, 48
 Helmle and Corbett, 24
 Helsingfors Railway Station, 144
 Hennell and James, 125
 Hesitation fatal in composition, 17; 30, 32-35
 Hoboken: bank, 141
 Hoffmann, L., 138
 Holabird and Roche, 130
 Horse Guards, the, 15
 Howells and Hood, 68
 Hulot, 112
- Ilkley: house at, 120
 Inigo Jones, 87, 132
 Inn sign: silhouette, 44, 48
 Institut, Palais de l’: plan, 109

- Ionic mouldings, 49
 Iowa: bank, 141
 Italian palaces: their projections,
 34, 73
 James, C. H., 125
 Jones, Inigo, 87, 132
 Kairouan: minaret, 11
 King's Cross Station, 10
 Kingsway criticised, 13
 Klein, S. T.: quoted, 82
 Klerk, de, 46
 Knott, R., 107
 Kootwyk Wireless Station, 146
 Kramer, P., 42
 Lanchester and Rickards, 56
 'Last Supper, The,' 53
 Lay-out, 104
 Leconte, M., 116, 123
 Le Corbusier Saugnier, 122
 Leicester's Hospital, 33
 Leonardo da Vinci, 53, 59
 Liberty's shop, London, 142
 Light and shade, 33, 34, 36
 Line: its contrasts, 27, 28, 31
 Line in silhouette, 48, 49
 'Link,' the: its use for complementary buildings, 15, 16
 Lintels as 'negative,' 55
 'Little Garth': plan, 120
 Loggia, Verona, 41, 43
 London, 10, 16, 56, 66, 72, 88,
 92, 93, 107, 110, 125, 132,
 142
 London County Hall, 107
 Long Island house, 74
 Louvre: Caryatides, 57
 Luthman, J. M., 146
 Lutyens, Sir E., 87, 120
 McKim, Mead and White, 128,
 130; 134
 Madeleine, the, 135
 Marseilles Exhibition: temple,
 60, 61
 Masonic Hall, 67, 68
 Mayence, Dom Kirche, 61
 Medici, Lorenzo di: his tomb, 63
 Mendelsohn, E., 42, 145
 Minneapolis Railway Station, 144,
 147
 Modern buildings: as conven-
 tional, 143-147
 — as creative, 148
 — new problems, 3, 115, 147
 Monotony, 26
 — as acme of unity, 66
 — of certain ratios, 9
 Monreale Cathedral, 28, 32
 Montreal: grain elevator, 143
 Monumental buildings: treatment
 of staircase, 137, 138
 Morocco Residency: French de-
 sign, 116
 Mosaic of plans, 112, 119
 Moscow palace: elevation, 83
 Mosque at Kairouan, 11
 Mullgardt, L., 45
 Mullions, 87, 88
 Murchison, K., 141
 Museum, British, 66
 Museums as typically conventional,
 140
 Naples: theatre, 34, 36, 37
 Nebraska Capitol, 83
 'Negative' elements, 51
 New Orleans Railway Station,
 69, 70
 New York, 30, 70, 72, 74, 134
 Opera House, Paris, 136
 Orders, classic: their vertical
 effect, 41, 43, 44
 — abuse in small scale composi-
 tions, 97
 Ornament, 55
 Östberg, R., 107

- Ottenheimer, Stern and Reichert,
132
- Padua: Chiesa del Santo, 27, 31
— S. Antonio, 11
- Pæstum: Temple of Poseidon, 79
- Palais de l'Institut: plan, 109
- Palazzo Communale, Siena, 28, 31
- Palmer & Hornbostel, 129
- Paris, 38, 39, 84, 109, 135, 136
- Peach, S., 146
- Penistone: lay-out, 104
- Pennsylvania Railway Station, N.Y.,
134
- Perret, A. and G., 115
- Persepolis: gate, 79
- Personality, 4, 6, 65
- 'Physiognomy' of buildings, 65
- Piazza dei Signori, Verona: loggia,
41, 43
- Pilasters, 43
- Pinchard, B., 120
- Plan, 100
— its abstract principles, 100-102
— types, 106, 123
— climax, 111
— elements, 113
— mosaic, 119
— new problems, 119
— external expression, 127
- Plastic design, 41, 42, 47, 48
- Platt, C., 125
- Pope, J. R., 74
- Port of London Authority Building:
plan, 110
- Portland, Oregon: design, 41
- Poseidon's Temple, Pæstum: plan,
79
- 'Positive' elements, 51, 52, 56
- Potsdam: Einstein Tower, 42, 47
- Prison wall as architectural screen,
131
- Projections as expressions of force,
30, 73
- Proportions, 6
- Proportions, 'golden rule,' 17
— as ensuring contrast, 26
— as source of 'expression,' 65
— in windows, varied for emphasis,
69
— of buildings, three-dimensional,
70
- Pugin, 88
- 'Radiation,' 59
- Railway stations, 10, 70, 144
- Ratios as base of design, 81, 86
- Rayland Castle: window, 88
- Rectangle: its qualities, 6
- Regularity, may become oppres-
sive, 29
- Repetition, of dimensions, 12, 13
— of pattern, 28, 32
— of 'motif' in façade, 66, 69
— of geometric figures in plan, 80
— of elements in plan, 96
— of units in lay-out, 10
- 'Resultant' in balance of picture,
19-22
- 'Reveal' of window expressive,
72, 73, 75
- Rhythm in architecture, 82
— as due to repetition, 66, 82
- Riccardi Palace, Florence, 34, 36
- Roi Soleil, Le*: its stern, 52
- Rome, 30, 60, 63, 108, 116
- Roofs of French châteaux as expres-
sive, 74, 76
- Roux-Spitz and Delamarre, 63
- Ruskin, 2
- Russian palace: elevation, 83
- Saarinen, E., 144
- Sacré Cœur, Church of, 38
- S. Antonio, Padua, 11
- S. Francesco, Assisi, 21
- S. Lorenzo, Florence, 63
- S. Maria Aracœli, Rome, 60
- S. Peter's, Rome: its scale, 96
— its plan, 116, 117
- S. Sophia, Constantinople, 79

- Salisbury Cathedral: cloisters, 32, 36
- San Carlo Theatre, Naples, 34, 36, 37
- San Diego Exposition: Botanical Buildings, 146
- San Francisco: shop front, 75, 76
- Saugnier, 122
- Scale, 89, 92, *et seq.*
- falsification of, 93, 95, 96, 153
- School, plan of, 109
- Science and the Infinite*, quoted, 82
- Scott, Sir Gilbert (*see* Frontispiece), 71
- 'Scottish Rite' Competition, Portland, 41
- Seamen's Union (Dutch), 42, 47, 48
- Selfridge's Extension, London, 92
- Selinonte: plan of temple, 112, 119
- Service rooms: their treatment in plan, 123, 124
- in façade, 133
- Shop front, London, 72
- San Francisco, 75, 76
- Siena: Palazzo Communale, 28, 31
- Silhouette of pattern, 28, 31
- of elements, 44, 48, 80
- Skyscrapers, 24
- their faulty projections, 74
- 'Small houses': their plan, 123, 124, 125, 126
- Solids and voids: their contrast, 36
- their proportions significative, 72, 75, 76
- Square as base of plan, 82, 86
- Squared paper: its use, 84, 85, 86
- Stability, 19, 20, *et seq.*
- of wall spaces, 66, 67, 68
- of geometrical plans, 80
- Staircases: their treatment in elevations, 137, 138
- Stockholm: church, 39, 40
- plan of Town Hall, 107, 121
- Stoke Park: plan, 118
- Strength as suggested by form, 69, 70
- by projections, 73
- 'Structural logic' incomplete by itself, 40
- Style: no one orthodox, 2
- Sullivan, L. H., 141
- Sutton and Whitney, 41
- Swedish architecture, modern: *see* Stockholm.
- Swiss room, 35, 36
- Symmetrical plans, 118
- their right use, 123
- a modern fashion, 123
- Syresham: house plan, 120
- Tageblatt* offices, Berlin, 145
- Tennessee Memorial, 128, 130
- Theatres, 34, 37; 115, 119
- Thion, M., 122
- Tokyo, Imperial Hotel: plan, 112, 119
- Tournon, M., 101
- Tours, Hotel de Ville, 16
- Railway Station, 10
- Tradition as handicap, 147
- Transoms: their position, 87, 88, 90
- Treasurer's House, York, 10
- Triangular basis of design, 79, 80, 82, 83
- Trinity College, Dublin: chapel, 31, 36
- Trystan Edwards: *see* Edwards, T.
- Tudor House, London, 142
- Union Station, Washington, 144, 147
- Unity, 5
- as obtained by background, 53
- as related to monotony, 66, 67
- of small house plan, 124, 125

- Vase: diagram of duality, 7, 8
 Vatican: plan of galleries, 108
 Vaults as obsolescent, 119
 Venice: Casa d'Oro, 22
 — Doge's Palace, 10
 — S. M. dei Miracoli, 27, 31
 Verona: loggia, 41, 43
 Versailles: part plan, 104
 Vertical effect of doorway, 11, 11
 — of the orders, 43
 — of 'skyscrapers,' 68, 70
 — of Gothic window, 69, 69, 71
 Verticality: how emphasized, 68, 70
 'Vesica Piscis': its meaning and use, 81, 82, 83
 Vestibules: their shape, 113
 Vinci, da: *see* Leonardo.
 Virchow Hospital, Berlin, 138
 Vitruvius Britannicus, 87, 118
- Walls as clues to the whole building, 114
 — as expressive, 129, 131, 132
 — their old and new construction, 112, 115, 116, 119
 War Memorials, 63, 71
 Warwick: Lord Leicester's Hospital, 33, 36
 Washington: Department of Agriculture, 16
 — Union Station, 144
 Weight: its meaning in composition, 19, 22
 Weight, indicative of function, 107, 112, 115-116
 Wells Cathedral: west front, 29, 32
 Wesleyan Hall, Westminster, 56, 57
 Whitehall, London: Banqueting Hall, 132
 — Horse Guards, 16
 Whiteley's Stores, London, 142
 Wijdeveldt, T. H., 46
 Wimbledon: lawn-tennis stand, 146
 Windows: their verticality, 67, 69, 71
 — their 'reveals,' 73
 — their proportion ratios, 81
 — their treatment in façades, 87, 88, 90
 — expressing function, 72, 80, 128, 130
 — placing in plans, 126
 Wireless Station, Dutch, 146
 Woolton, Sir H., quoted, 4
 Woolworth Building, N.Y., 70
 Worthington, T., 67, 68
 Wren, Sir C., 15
 Wright, F. L., 112
- York: Minster window, 69
 — Treasurer's House, 10
 York and Sawyer, 134
- Zurich: room, 35, 36, 37



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