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The individual artist is limited. If he is to creatively synthesize the tremendously numerous and complex elements of experience, it must be with reference to his own way of seeing things; in the light of a personal dogmatism, if you will. Only in this way is such a synthesis possible for him and the results of that synthesis available to the rest of us. As Dr. Gauss implies in his article, the creative synthesis is not a phenomenon peculiar to what is popularly called 'the arts'. In one sense of the word, there are as many artists concerned with astrophysics and chemistry as there are with color and form. These diverse activities may be distinguished by the extent to which it is possible and necessary for the artist to work in terms of an abstract, generalized body of knowledge; in terms of what is, for better or worse, often called 'objective reality,' rather than the 'subjective reality' of a personal insight. In some activities the limitations are imposed almost entirely from without; in others, they are almost entirely self-imposed.

The position of architecture in such a context is peculiarly ambivalent. The external limitation—limitations of a type shared with the sciences—of function, of materials, of geographic position, and of technology are powerful, but oddly enough not immediately inescapable. These external limitations do not provide a closed system of equations. To them must be added, as is the case in painting, music or the drama, the self-imposed limitations of the artist. This divided nature of the practice of architecture is at once its great fascination and its greatest danger. The temptation is to move to either extreme, and it is not difficult to point out many examples of both.

In our previous issue we presented an investigation of one of the external limitations, the structural. These limitations are in one sense easy to talk about once the preliminary difficulty of a suitable language is overcome. How are we to deal with the subjective limitations which, by their nature, are not susceptible to a language? There seem to be two possibilities: one, to present the results thereof, so that the observer can react directly; and the other, to talk around them in the hope that, if some of the subsidiary difficulties are cleared up, the way will be open to a direct appreciation.

Dean Hudnut's approach is a combination of both. He first presents the various piazzi, places, and squares visually, (of course, within the very serious restriction of photographic reproductions), and then, by a description of the works themselves and of their social milieu, hopes to sharpen the observer's appreciation. Dr. Gauss approaches the problem from an analytic, rather than a descriptive, point of view: if some of our muddled ideas on art can be clarified by pointing out the relationship of art to all activity and the relationships of one artistic discipline to another, one of the barriers to a fuller understanding may be overcome. Finally Dr. Hodin briefly tackles the difficult problem of criticizing work which is of necessity the result of a personal, subjective insight.

In presenting the work of the five painters on the School of Design staff, we have two motives. Many readers of this magazine have received a somewhat distorted impression of the school from the many articles we have published on structural matters. We hope to correct this impression to some degree. Our essential purpose, however, is to present to the reader, perhaps for the first time, the work of several talented artists.

THE EDITORS

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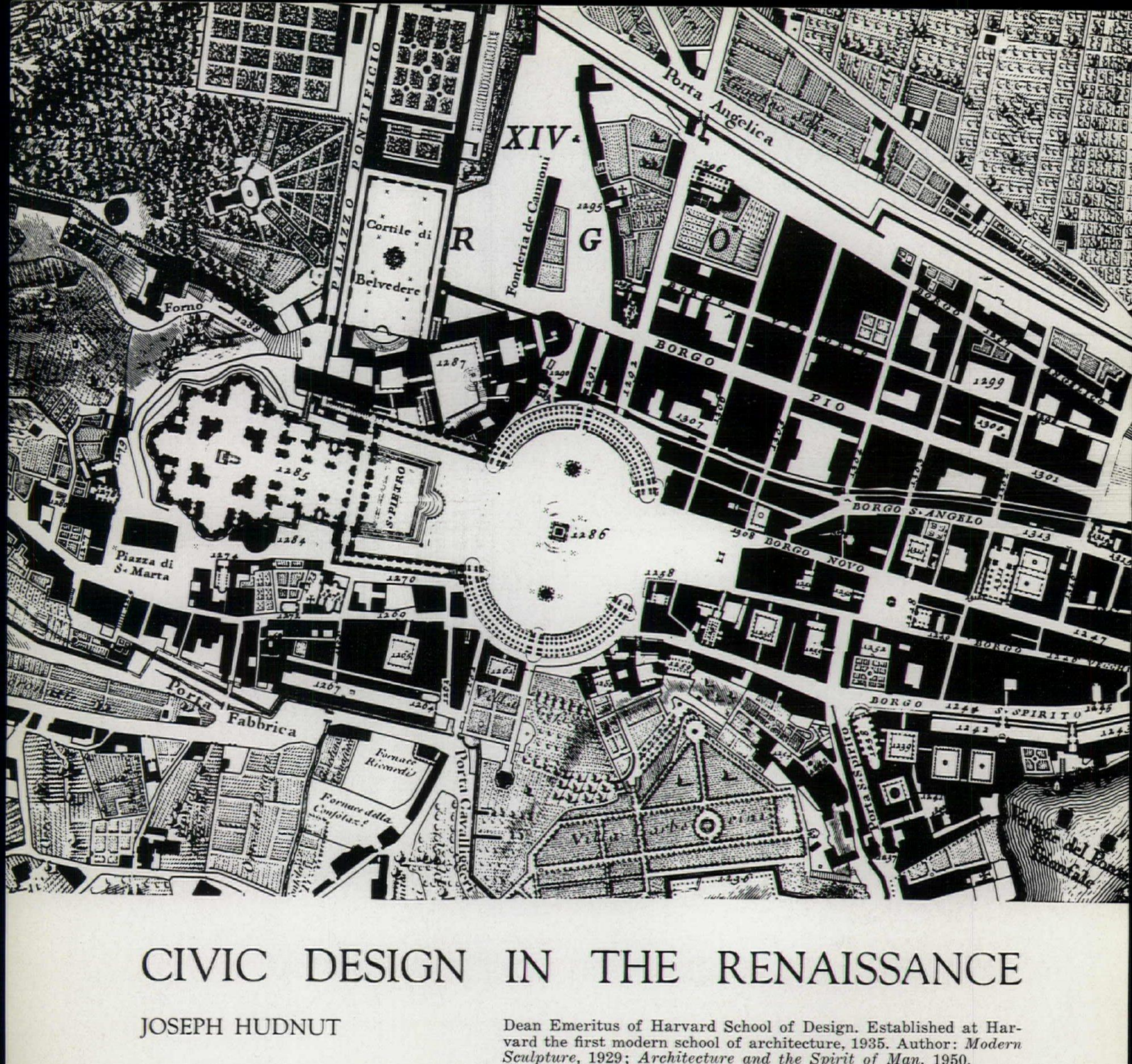


CIVIC DESIGN IN THE RENAISSANCE

JOSEPH HUDNUT

Dean Emeritus of Harvard School of Design. Established at Harvard the first modern school of architecture, 1935. Author: *Modern Sculpture*, 1929; *Architecture and the Spirit of Man*, 1950.

The following three lectures were delivered at the School of Design in November, 1956.

ROME

Three characteristics of civic design in the Renaissance set it apart from the civic design of our own day. I shall state these at once in the hope that I may in this way assist you to an understanding of a delightful and rewarding art—even though this art may lie outside that climate of opinion, or prejudice, which surrounds our own judgments in matters of design.

In the first place, civic design in the Renaissance was *episodal*. By this I mean that each project in design was created without reference to other projects. Each project was a work of architecture set in the city as a building might be set. Although the Renaissance architect did sometimes draw ideal plans for an entire city, these were, with rare exceptions, academic exercises without practical influence on the aspect of cities. In practice his art was independent and occasional.

A consequence of this episodal character is a strong individuality of character in all projects of civic design. In Rome, for example, these projects are so varied in nature, so full of invention and surprise, that one might readily believe that they belong to several epochs in architectural history. Yet there is in them also a unity of theme which seems to unite the city as a whole into a general, and even, schematic, pattern. The theme is the *piazza*, the open space laid out before a monumental building. The piazza, occurring again and again amid the uneven streets of the city, stamps its character on the city in much the same way as a theme in music, repeated and decorated in varying tonalities, stamps its meaning and its beauty on the movement of a symphony.

Many of the Roman piazzi are clearly shown on the famous *Plan of Rome* published in 1748 by Giovanni Battista Nolli—a section of which is reproduced as Figure 1. Each of these piazzi fuses into the city plan the enclosed space of a church or palace; each is an essential part of a design that includes exterior and enclosed space. Their variety is infinite: the stately rectangle laid out before the ancient three-aisled church of the Dominicans, the bizarre stage setting of S. Ignazio, the baroque grandeur of Il Gesu, the intimate charm of S. Maria della Pace, the perfect *mise-en-scène* provided for the antique Pantheon.

These do not, it is true, encourage a free flow of mechanized traffic in a modern city. They are being destroyed, one by one, by the automobile.

In the second place, civic design in the Renaissance is *formal*. Alberti defined form as "the harmonious integration of all elements" and he said that the integration would be complete when no part could be added, and none taken away, without destroying the whole. Obviously this ideal of form did not rest on an expression of function; it was a reflection, perhaps, of that passionate desire of the Renaissance to find form in the universe and to affirm the dignity of man and his institutions as the central elements in that form. The art of the Renaissance was, at heart, a philosophical one.

Many rules were formulated for the achievement of Alberti's impossible ideal of

form. Some of these are illustrated in the **Piazza Farnese,** with the imposing place beside it, shown in Figure 2. *Symmetry* is the cardinal principle: piazza and palace united by the firm axis. *Proportion* is only slightly less essential: the rectangular piazza repeats the shape of the palace facade and this in turn anticipates the majestic "cube of space" that forms the court. And even in my somewhat diagrammatical representation you will no doubt note the *rhythmical disposition* of the detail: the two fountains, for example, that assist the centrality of the whole, and the arrangement of the streets entering the piazza, setting the design aside from the city. A space thus organized has little utility. It is the forecourt of a palace, of a great monument. It is an element of form.

In the third place, civic design in the Renaissance was *romantic.* In the mind of the Renaissance designer stood always the vast splendid tradition of the Roman Empire; always his imagination was filled by the beauty of that majestic civilization, forever passed away, by the renown of its heroes, by the magnificence of its cities, by the grandeur of its architecture. And this romance was especially eloquent in Rome where, all around the crowded and tangled city inherited from the medieval centuries, lay, in still-unexplored acres, the enrapturing debris of the ancient city. The Renaissance designer did not imitate the antique architecture—except to borrow from it the columns and arches that decorated his facades—but he strove ever to recapture its spirit and to make that spirit one with his own. That, after all, is the very essence of romanticism.

The Pantheon is one of those rare relics of antiquity which medieval Christianity bequeathed to Renaissance Rome. Recon-

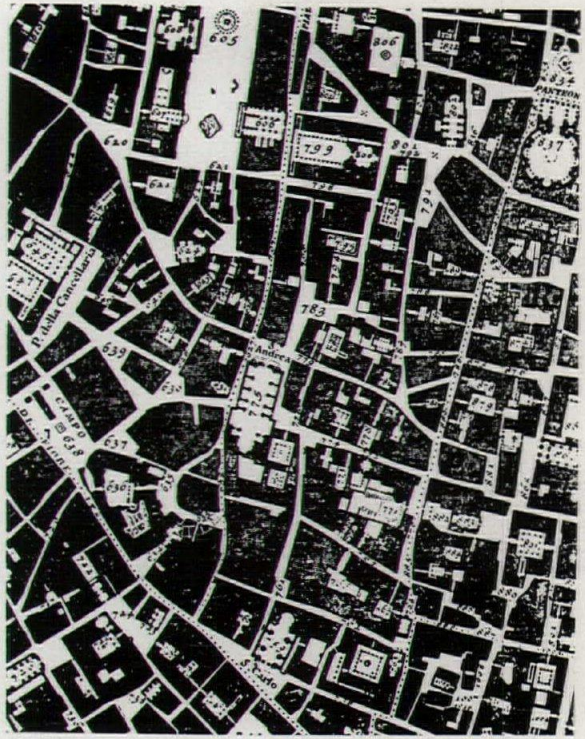


Figure 1

Figure 2

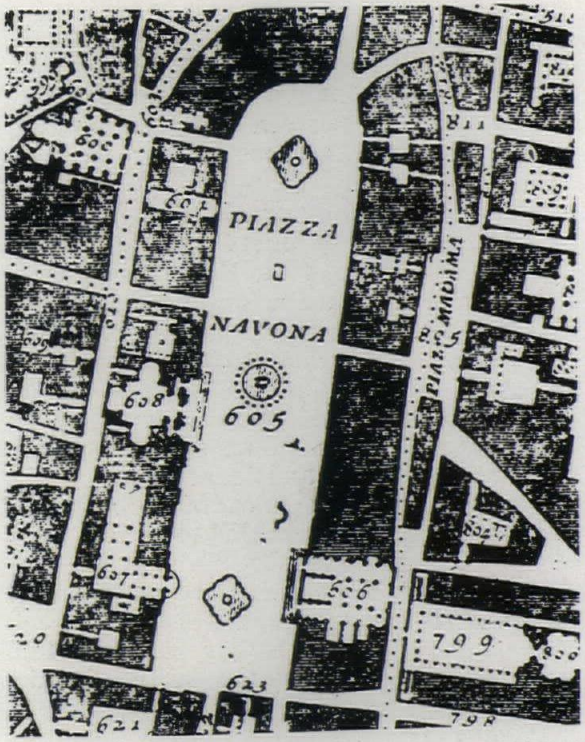


Figure 3

Figure 4

secrated as a church it has survived the wrecker and the lime-burner. A nobly conceived piazza laid out before it links it to the city: an outdoor room just large enough to give added majesty to the fine portico. And note how perfectly this portico—a half-enclosed block of space—pulls into unity the piazza, enlivened by its beautiful fountain, and the vast silence under the great vault of the interior.

Both the Piazza Farnese and this **Piazza di Rotonda** (laid out before the Pantheon) are examples of that quiet, restrained and clearly-defined style that is often called *neo-classic*—in distinction from the more plastic and dramatic style of the later piazzi. The **Piazza Navona,** the plan of which is shown in Figure 3, was at first designed in this sedate manner under the Pope Paul II (about 1540). It was then rebuilt, in part, in the new manner by Innocent X (about 1645). The Piazza Navona, one of the most beautiful in Rome, may then be said to belong to both periods.

The site is that of the Circus of Domitian. For many years after the fall of the Empire games were still held here—not of course with the ancient magnificence—while the squared stones of the seats, which surrounded the arena on three sides, were used as the building material for many churches. Paul erected new and stately buildings on the foundations built for these seats, and at one side of the area he built a church—the Church of S. Agnese. All of these buildings were classic in their simplicity.

Innocent X, whose architect was the great Bernini, restored the piazza to the shape of the Circus of Domitian; enlarged his own palace, the Palazzo Pamfili, situated on the piazza; and entirely rebuilt the Church of S. Agnese. He then commissioned Bernini to set up three fountains, one of them at the center of the piazza.

Thus remodeled, the design retains much of the neo-classic spirit. It is spacious (perhaps too spacious for the church) and full of grace. But the long wall of the reposeful palaces which surround it is suddenly interrupted at one side by the upward thrust of Borromini's richly modeled towers, framing a recessed and curved facade beyond which rises a spirited dome. The contrast is as dramatic—and as successful—as any design in Rome. The *baroque* quality of the church reaches out into the piazza in the three superb fountains: the central one, the Fountain of the Rivers, unrivaled in all the world. The Church of S. Agnese (Figure 4) had no other purpose, it is said, than to decorate the city. Perhaps that is purpose enough.

Another piazza which also began as a neo-classic design and ended as baroque is the very famous **Piazza di Campidoglio,** built under Paul III (1537) by Michelangelo, and rebuilt (after 1568) by Della Porta and Rainaldi. This piazza lies on the Capitol Hill —a "stage for heroes to strut upon"—and is surrounded by buildings on three sides only, so that the fourth side, lying at the edge of the hill, commands fine views over the city.

The destruction of the Roman buildings on the Capitol began in the fourth century and seems to have been carried on almost continuously to the end of the fifteenth century. By that time only the Tabulatium, transformed into a fortress, was left standing. On the southern crest of the hill, site of the Temple of Jupiter, which was once the "wonder of the world," was a pasture for goats. On the northern peak of the hill, where once stood the splendid Temple of Juno Moneta, there stood (and still stands) the monastic church of S. Maria Aracoeli. A stairway, built (about 1350) of great marble blocks taken from the Temple of the Sun, leads up to this church; and the people still climb these steps barefooted to implore the intercession of the Virgin.

The Piazza di Campidoglio—the Piazza on the Capitol—lies between these two summits of the hill. Since the time of Augustus this area had not been built upon. It was sacred ground, the *Asylum,* upon which Romulus had welcomed the refugees from Latium. It formed in the time of the Empire a splendid forecourt to the Tabularium which bounded it to the east. When therefore the great pope commanded his architect, Michelangelo, to restore the Tabularium and lay out before it a fine public place, he must have had in mind the re-creation of an ancient symbol. Paul was a Roman and in restoring to the people of Rome some share of their former liberties he may have wanted to remind them of this ancient dignity. The Tabularium—re-christened Palazzo del Senatore—became the center of the municipal administration; and Michelangelo built on the site of the Asylum the "happiest piazza-design of the Renaissance."

Michelangelo planned a regular area like that of the Piazza Farnese but the difficulties of the site made it impossible to make the north and south sides parallel. The pope had commanded him to rebuild along the north side, and on the existing foundations, the medieval Palazzo dei Conservatori—the Palace of the Town Councilors—and although there was no need for a third building along the south side, Michelangelo proposed that one should be built there in order to give symmetry to the design as a whole. Nothing could illustrate more clearly the Renaissance need of form. Long after the death of the architect, when the unbalanced design had become unendurable, the third building, the Capitoline Museum, was built (1644).

In the meantime the character of the Campidoglio had been completely changed

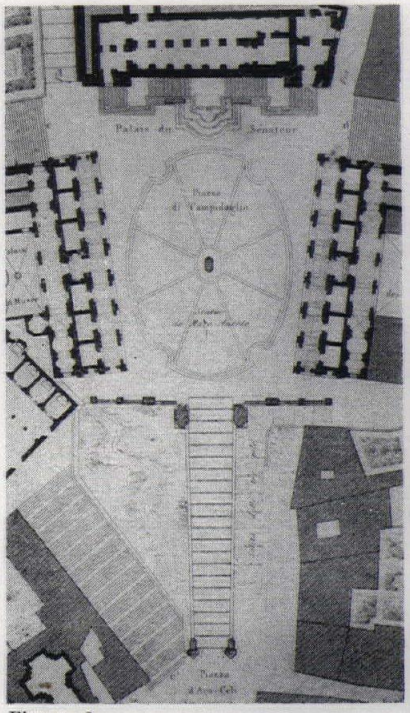


Figure 5

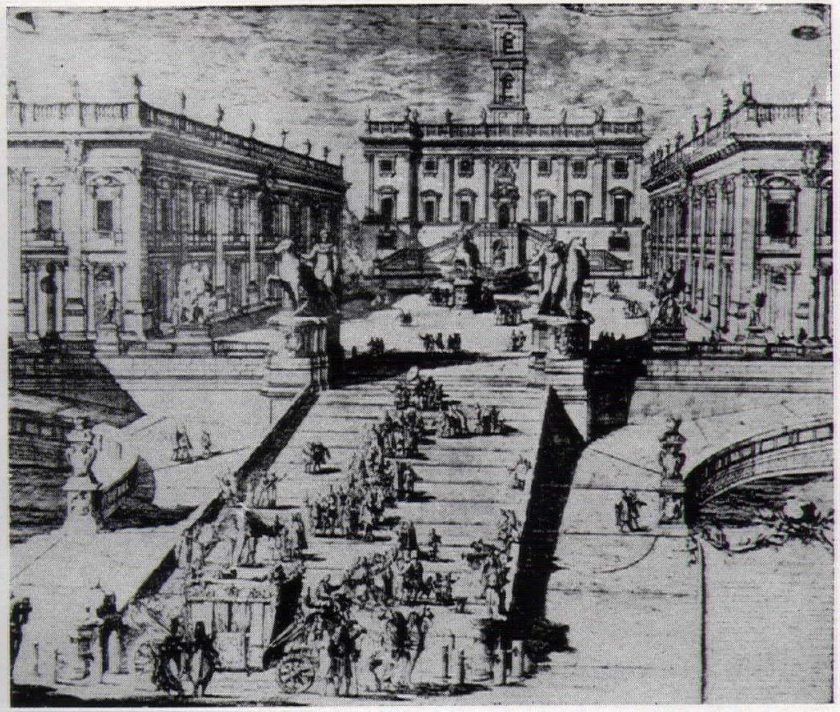


Figure 6

by the additions of the baroque architects. The long ramp, leading up to the piazza from the west, was added by Della Porta in 1568 together with the granite lions at its base and the superb statues of the Dioscuri, and their horses, at the top. The great fountain in front of the Palazzo del Senatore, where it is framed by the beautiful stairway of Michelangelo, was also added by Della Porta who at the same time relieved the severity of the master's facade by a profusion of unessential ornament. The flights of steps which lead right and left from the facade of the Senatore to the two crests of the Capitol Hill were built by Michelangelo's pupil, Vignola.

The consequences of these changes is a transformation of a design that was regular, static and geometric into a design in which movement and complexity are the dominant characteristics. This is clearly illustrated in the fine engraving by Alessandro Specchi reproduced as Figure 6. Entering at the bottom of the ramp the visitor feels at once an impulse to move upward between the two Dioscuri and then, attracted by the dramatic play of sculpture, fountain and stairway at the base of the Palazzo del Senatore, to go forward between the extended arms of the palaces at either side. The equestrian statue of Marcus Aurelius, placed by Michelangelo at the center of his quiet enclosure, becomes only an incident in this progression.

There is still another piazza which, like the Piazza di Campidoglio and the Piazza Navona, began as a neo-classic design and was transformed into a baroque design by successive rebuildings. This is the **Piazza del Popolo,** a work of unparalleled pomp and dignity.

This piazza was an important link in the system of avenues built under Sixtus V (1585-1590). Dominico Fontana, the pope's architect, laid out over the vast area of the ancient city which was still unbuilt a network of straight roadways which tied together the more important of the Christian shrines. These became in later days a fortuitous frame for the expansion of the city. As it happened the shrine of S. Maria del Popolo was selected as one of the focal points in this system and, following precedents established at the more famous shrines, the pope commanded his architect to dignify this modest building with a piazza.

The piazza thus built lies at the northern edge of the city just inside the ancient Roman wall (Figure 7). The avenue built by Sixtus V enters this space along the steep slope of the Pincian Hill; a second street enters from the market place established on the bank of the Tiber; while a third street, lying between these streets, leads from the Capitol Hill at the opposite side of the Renaissance city. Thus the piazza, although intended as an adjunct to the shrine of S. Maria del Popolo, became as if by accident, an important element in the street system of Rome. Lying in the narrow space between the river and the Pincian Hill it channeled all of the traffic between the city and the northern part of Italy. Obviously this gave to the Piazza del Popolo a character quite distinct from the other piazzi of Rome: from the Piazza di Campidoglio, set on its hill above the city, from the Piazza Navona, a refuge from the confusions of the city's streets.

The piazza designed by Dominico Fontana is shown in Figure 8—a detail from the charming *Plan of Rome* published in 1645 by Antonio Tempesta. At the left is the city wall built by the Emperor Aurelian; beside its gate lies the church of S. Maria del Popolo; and beyond the church the convent and the hillside that remained for several centuries the convent's property. In the foreground beside a vineyard we are given a glimpse of the "squalid tenements and mean houses" of a district believed to have been a center for the thriving business of prostitution in the pilgrim-crowded city.

Fontana had discovered in the ruins of the ancient city no less than four great obelisks brought thither from Egypt. He had placed one of these in the piazza in front of the Lateran and a second beside the great church of S. Maria Maggiore. The third he now raised at the center of the Piazza del Popolo placing it in such a way as to lie on the axis of each street leading into the piazza. The obelisk formed, he said, a "promise of rest" at the end of each vista and, since it thus formed an element in each vista, it united them with "a secret harmony." Fontana intended of course to remove the fountain at the center of the piazza; it remained nevertheless for another hundred years.

Fontana's design is characteristic of the neo-classic conception of civic design. Equally characteristic of the baroque conception is the design as transformed, under the pope Alexander VII, by Carlo Rainaldi. (1667) Fontana, who had contrived his piazza with an eye to those persons who approach it from the city, strove for an effect of repose and grace; Rainaldi, who thought only of the piazza as it might be seen by those who approached the city from the north, intend-

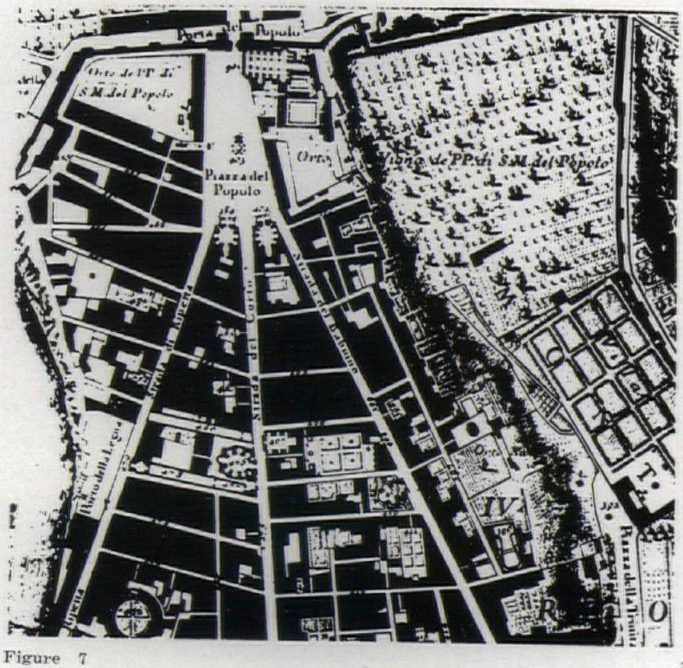


Figure 7

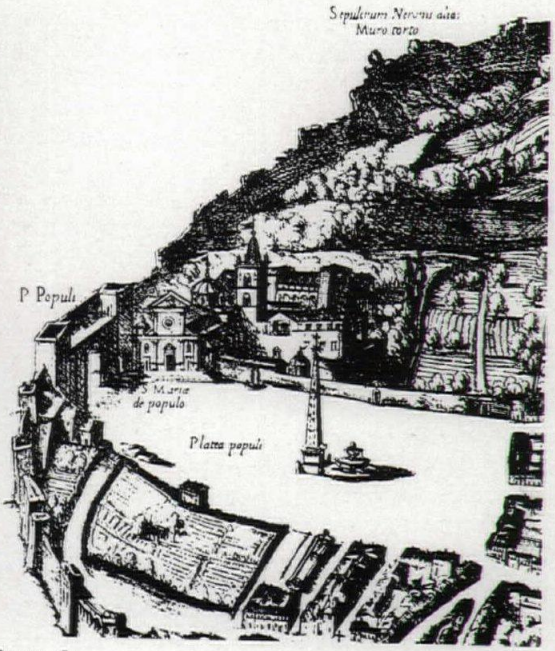


Figure 8

Figure 9

ed, rather, an effect of splendor, movement and invitation. To carry out this idea he built two churches, alike in mass and silhouette, at the intersections of the streets leading into the city "to frame the entrances of the city and to foretell the magnificence it contains."

There can be no doubt of the success. The space of the piazza seems to flow forward as we pass through the gate in the Aurelian Wall; we feel an imaginary pressure into the three streets that confront us; and the space seems to flow onward through the sculptured masses of two churches. They are the leaders of the pageantry of Rome.

The character of the Piazza del Popolo, as created by Rainaldi—and in part by Bernini, is captured in the fine engraving by Wouters reproduced in Figure 9.

While these transformations were taking place at the northern gate of the city another piazza, the largest and most famous of all piazzi, was taking shape in the papal city on the other bank of the Tiber. The **Piazza di San Pietro** was completed in its present state in 1663.

The history of this project begins with the return of the papacy from Avignon. The center of the Roman Church was then shifted from the ancient shrine of San Giovanni Laterno to the shrine of San Pietro and a new city was laid out by the Florentine architect Rossellino between this shrine and the huge Castello San Angelo. Rossellino built a piazza in front of the ancient church. There was to have been a second piazza west of the Castello and three streets, lined with arcades were to have joined the two piazzi. The death of Nicolas V (1455) brought this project to an end.

It was not until the time of Sixtus V (1585-1590) that a serious effort was made to complete the Piazza di San Pietro. The pope commissioned his architect, Dominico Fontana, to design and carry out a new scheme for this piazza. Fontana, continuing the style he had developed at S. Maria Maggiore and at the Lateran, proposed a great rectangular space, immense in area, at the center of which there should stand a great obelisk.

Fontana had in mind the obelisk which was then standing, at a short distance from San Pietro, amid the ruins of the Circus of Caligula. One hundred and fifty years before this time Nicolas V had commanded his architect, Fioravanti, to move this obelisk to the center of the piazza; but Fioravanti had declared that such a task was impossible of achievement. With this judgment Michelangelo agreed, as did every other architect whose opinion was asked. Fontana now declared that he would carry out the command of Nicholas V.

The obelisk had been brought to Rome from Heliopolis by Caligula about 39 A.D. and by him set up on the *spina* of the great circus which he, and Nero, built along the southern slope of the Vatican Hill. It stood 82 feet in height, a monolith of red granite, the second largest obelisk in the world. Fontana moved it with the aid of 800 workmen, 140 horses and 40 "machines" and raised it successfully on a high pedestal—where it stands today. Sixtus, who had crowned the Column of Trajan with a statue of Saint Peter, topped the obelisk with a cross.

The death of Sixtus brought to an end the project of Fontana; and, except for the construction of a fountain, 45 feet high, by Carlo Maderna—who in the meantime had completed the facade of the church—nothing more was done about the piazza until 1650. The Jubilee of that year had brought such vast crowds to Rome as to make some provision for them at Saint Peter's seem

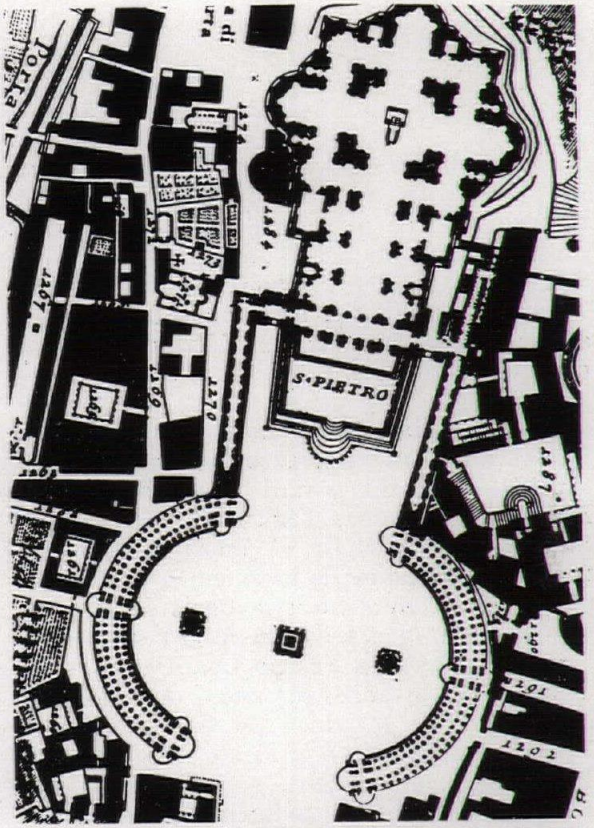
imperative, and the idea of a monument that should express the splendor and grandeur of the Church in terms not less imposing than those of the Ancient Empire had taken possession of the imagination of the time.

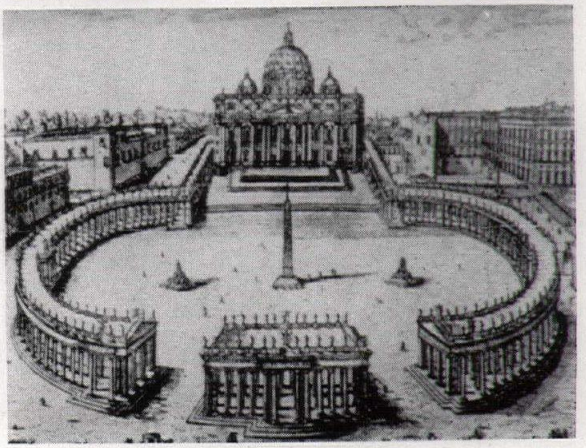
Bernini's scheme comprises two parts: a great oval space, centered on the obelisk of Fontana, and a smaller space, trapezoidal in shape, between this oval space and the church. The beautiful steps of the church were projected forward into this trapezoidal space.

The oval space is surrounded not by buildings, but by colonnades forming covered passages. It measures 787 feet along the north-south axis. The smaller space is framed, north and south, by covered passages between solid walls. These connect with the great narthex of Saint Peter's. The plan, as shown by Letarouilly, is illustrated in Figure 10.

It is probable that Bernini intended to build at the west side of the oval space a large building, a propylaea, that should continue the line of the colonnades. Such a structure is shown on the engravings of Falda*, reproduced in Figure 11. Had this building been built Bernini would have realized that sense of enclosure which, as we have seen, is an essential of beauty and character in a piazza. The failure to carry out this work did not however wholly defeat "the greatest building enterprise of the Renaissance."

* Falda: Seconda Libre del Nuovo Teatro del Fabriche Roma (1665).





Top: Figure 10

Bottom: Figure 11

PARIS

I shall begin my account of civic design in Paris with a detail from the splendid *Survey of Paris* published in 1734 under the direction of Michel Turgot, Marquis de Sousmons. In this survey, known as the *Turgot Plan,* all the buildings of Paris are shown in neat isometric projections—a wonderful document for the study of civic design.

The first piazza laid out in Paris—and in Paris called, not a piazza, but a *place*—is illustrated in this detail from the Turgot Plan, reproduced as Figure 12. This place, built in 1614 by Henri IV and by him called the **Place Dauphine,** is prescient of the many places which were built in Paris during the Renaissance. It offered, one might say, a pattern in which the French qualities in civic design were established; and I do not know of any pattern in which the divergencies of French conventions and ideals from those of Rome are more evident.

Henri, the "most intelligent of the French kings", was almost modern-minded in his solicitude for the people of Paris. He was willing to neglect his chateaux and his gardens and to give his attention to the rebuilding—and the replanning—of his capital city. And among his projects addressed to the welfare of Paris was the fine new bridge, still called the Pont Neuf, which he built across the Seine and which, for the first time in the history of the city, provided unimpeded circulation between Université and Ville.

This bridge crossed the river at a short distance west of the Cité—the island upon which stood the cathedral and the ancient palace of the kings of France. Henri, probably at the suggestion of his architect, Androuet du Cerceau, filled in the space between his new bridge and the island, so that the western point of the island rested on the bridge. The architect then raised the level of the island at this end to the height of the bridge; surrounded the newly made land with a stone embankment; and built upon the platform thus created the earliest construction of the Renaissance in Paris.

I mean of course the first construction in which the Renaissance ideals of order—of dignity, law and repose—are exhibited. I mean the first reflection in Paris of that new light which as we have seen had already illumed the city of Rome. I do not mean Renaissance ornament.

This ideal of order had already assumed qualities that were distinctly French. The classical spirit already manifests itself in the "conformity to reasoned canons", the clear logical presentment, the concise restrained statement which we have learned to value as the excellence of France. We shall seldom find in Paris the extravagant, romantic and overwhelming grandeur of Rome.

A place in Paris has always a simple geometric plan. The rectangle is preferred, but there are also round plans and triangular plans—like that of the Place Dauphine. (This shape was of course suggested by the shape of the site.) The space within this plan is usually enclosed on all sides; enclosed, as a rule, by buildings but sometimes by garden forms. When buildings form the enclosing walls they are uniform in their facades and so designed as to carry all around the enclosed space the firm horizontal rhythms of

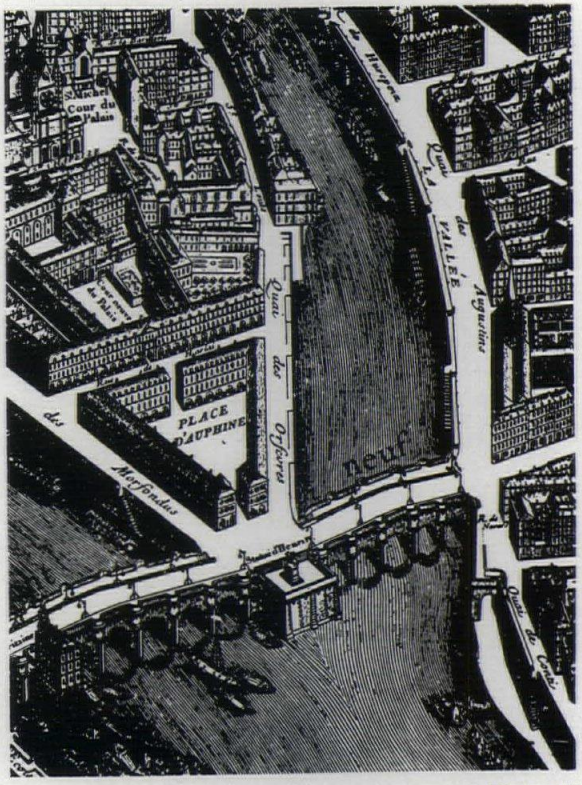


Figure 12

their cornices and stately windows. There is no imposing public monument, such as a church or palace, to which the place is appendage and forecourt.

In its early forms the place is residential in character. It is essentially a housing project. The Place Dauphine is surrounded by row houses—houses separated by party walls —and these are set aside from the noise and confusions of the city, as dwellings should be. They have, as you will note, two facades, one on the place, one commanding the views over the river. Their scale is residential and they retain many characteristics of the country-built chateaux from which the scheme as a whole is, in part, also derived. The influence of the countryside, in which French Renaissance architecture originated and developed, will appear many times in the places of Paris.

There is another characteristic of the Parisian place which will at first seem to be quite inconsistent with their function as residential centers. They were built as frames for statues of the kings of France. At the center of each there was planned a representation in bronze of the king who reigned at the time of building. Each place was laid out in Paris as an act of homage.

It is improbable however that Henri IV intended that a statue of himself should be placed at the center of the Place Dauphin. A statue of the king—the first equestrian statue in Paris—was made in Bologna after Henri's death and was set up by his widow, Marie de Medici, on a stone platform projecting westward from the bridge. An association of place and royal statue—of civic design and the "monarchal mystique"—was thus established.

Richelieu was the first to place such a monument at the center of a place. The statue of Louis XIII which he raised in the **Place Royale** is shown in the detail from the Turgot Plan reproduced as Figure 13. This place, begun by Henri IV but unfinished at his death (1610), was completed by the great cardinal who was thus able at small expense to honor the new king with a statue magnificently framed. This statue was the first to be destroyed by the Revolution.

Henri took infinite pains with the Place Royale. It is said that he went every day to inspect the work as it progressed and he was very insistent that all of the houses, although built by various persons who had leased parts

of the land, should be strictly uniform in the pattern furnished by the king's architect, Androuet du Cerceau. The interest of the king assured the practical success of the enterprise; and after there was held here the grand fête, which celebrated the marriage of Louis and the Spanish princess, the Place Royale became an aristocratic center. The magnificent *tournoi* which brought the fete to a close is the subject of one of Chastillon's most wonderful engravings.

The Place Royale—now called the Place des Vosges—is one of the finest relics of Renaissance art in France. It has lost little of its beauty even today when it is crowded with trees and the ornamental trimmings of English romanticism. Sylvestre, in the charming engraving reproduced as Figure 14, has preserved for us some of the noble serenity that must have informed the design when it first appeared in the chaotic medieval city. And I have included also, as Figure 15, a photograph of some of the houses. Their disciplined and unaffected elegance announced a new era in the history of French architecture.

Louis XIII did not add another place to the city of Paris. The great plans formulated by Henri and by his minister, Sully, were carried forward slowly by Richelieu and then abandoned. The cardinal left Paris, as if by accident, the beautiful garden of the Palais Cardinal which, surrounded in the seventeenth century by uniform pavilions and in the eighteenth century by the fine galleries of duc d'Orleans, afforded the Parisians a "breathing space" not less fashionable than the Place des Vosges. But this garden was not a place. It was an appendage to a chateau and has none of the characteristics of a work of civic art as the term *place* indicated in the Renaissance.

A development of much greater impor-

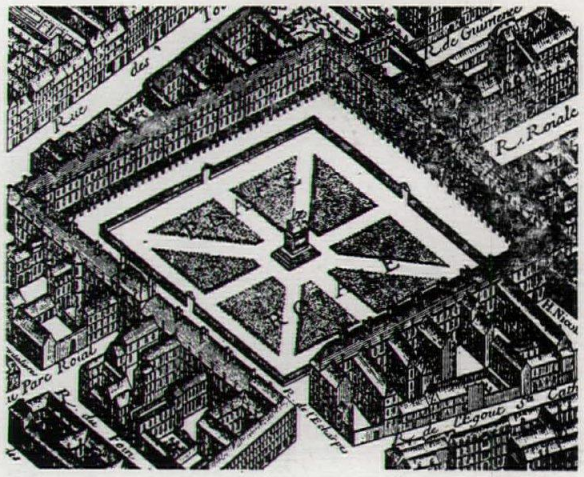


Figure 13

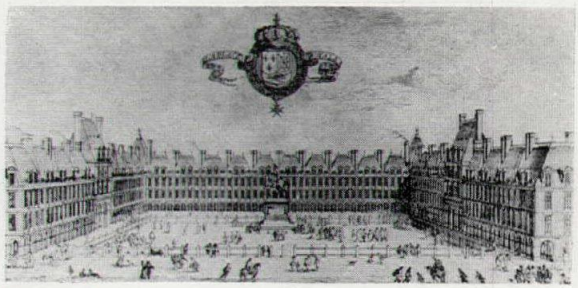


Figure 14

Figure 15

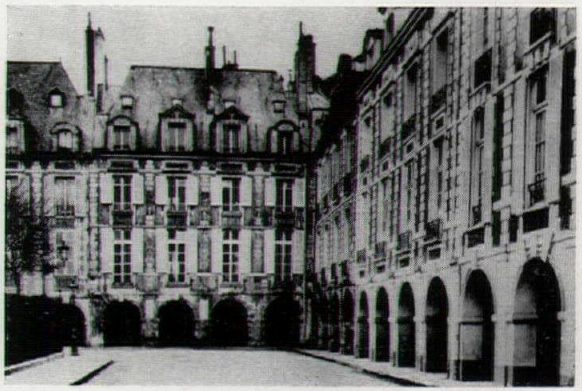


Figure 16

tance was carried forward under Louis XIII. The idea of channeling the Seine as it flows through Paris with stone embankments began at this time to command the imagination of architects. Probably it was the king's architect, Louis le Vau, who first understood the grandeur of this idea. Philibert de l'Orme, who built the Tuilleries for Catherine de Medici, had treated in a charming manner the river bank along the queen's garden and this treatment had been continued by Marie de Medici along the promenade, the Cour de la Reine, which extended the earlier garden westward. We have seen also the embankments which Henri IV built around the Place Dauphine. To the ministers of Louis XIII and to his architect we owe the broad program of an architectural treatment that should comprise all of the river west of the Cité. The Seine, flowing westward between monumental buildings, should form a great "cour d'honneur" at the heart of France. Louis le Vau had this magnificent conception in mind when he built the stately College des Quartes Nations on the southern bank opposite the Louvre.

The embankments west of the Place Dauphine are shown in the detail from the Turgot Plan which is reproduced as Figure 16. The work of building these walls of masonry and the promenades they support occupied many years. The Quai Malequais, along the southern side, was not built until 1669; and the extension of the embankment along the shores of the Cité had not been undertaken, as you will note, when Turgot, in 1734, published his great "Plan." But ultimately the entire river, as passes through Paris, was contained in this wonderful construction, unsurpassed in all the history of civic design.

Louis XIV seems to have taken little interest in the development of Paris. Colbert "intended to do great things" but nothing seems to have come from his intentions. The king "satisfied his zeal for his country by building interminable and costly chateaux" —including of course Versailles.

Nevertheless, the king consented to be honored by the city; and Paris is decorated as a consequence of his condescension by two of the city's most famous places.

The first of these, the **Place des Victoires**, was created largely through the initiative of the marèchal duc de la Feuillarde who not only paid for the equestrian statue of Louis which stood at the center of the place, but contributed not less than 500,000 livres for the cost of the land. The honor that thus

crowned the king can be scarcely defined therefore as evidence of public enthusiasm.

The king commanded his architect, Jules Hardouin Mansart, to design a setting for the statue, which, already complete, comprised not only a figure of Louis on his horse, but an allegorical figure, Immortality, who crowned him with laurel, and a Cerebus with three heads, supine under his feet, to represent the Triple Alliance. From the somewhat mythical victories of Louis over Holland, England and the Austrian Empire the place drew its name, Place des Victoires.

Mansart was confronted by infinite difficulties. The site was intersected by two streets; it was impossible to create a reposeful setting, apart from the turmoil of traffic. The site was too restricted; the dignity of the king was certain to be compromised by a lack of breadth and grandeur in his entourage—and nothing could be more distasteful to the *devoté du culte monarchique* than an impression of intimacy either of buildings or of populations. And the statue itself, theatrical and sentimental, could scarcely have been pleasing to Mansart's aristocratic and classic taste.

Mansart nevertheless overcame these handicaps with consummate skill—only to have his design ruined by the stupidity of those who carried it out. He set the statue in a circular place since that was the only way in which the streets which entered it could be arranged in a symmetry; and then he placed the statue on the axis of the widest street, the Rue des Fosses-Montmartre, which leads to the place from the river. No street entered directly behind the statue so that the buildings there formed a stately background, like the apse of a church. And these buildings, carried all around the central space, were given a uniform facade of exceptional distinction: not a row of houses, as in the Place des Vosges, but an order of engaged columns resting on a pedestal of arches. These are beautiful both in proportion and detail.

The Turgot Plan shows us how this design was distorted in execution. I have preferred to reproduce as Figure 17 the excellent engraving of Perelle.

At this time Mansart was engaged on another Parisian place the more famous **Place de Vendome.** This also was built to honor Louis XIV and the equestrian statue of the king was to be placed at the center of a great frame of architecture.

Louvois, who initiated this project, began it with grandiose ideas worthy of Bernini. He set aside for his purpose the wide estate, lying north of the Rue St. Honore, which Henri IV had given to his son, the duc de Vendôme. For this site Mansart proposed a place, square in plan, surrounded by monumental buildings uniform in design and having a scale far larger than anything yet seen in Paris.

These buildings were to be built on three sides of the place, the fourth side being open to the rue St. Honoré. The statue, thus framed in massive arcades and superimposed columns—not unlike those of the Colosseum —was to face this street (Figure 18).

This setting, suggested no doubt by Michelangelo's design of the Piazza del Campidoglio, is perhaps the best ever proposed for an equestrian statue. An equestrian statue demands a wide space and an heroic enframement. It is "directional" in character and must move outward against a static background. Where centrality is a requisite, as, for example, in a square piazza surrounded by uniform structures, an obelisk or a column is to be preferred.

I have reminded you of these somewhat obvious principles so that you will have

Figure 17

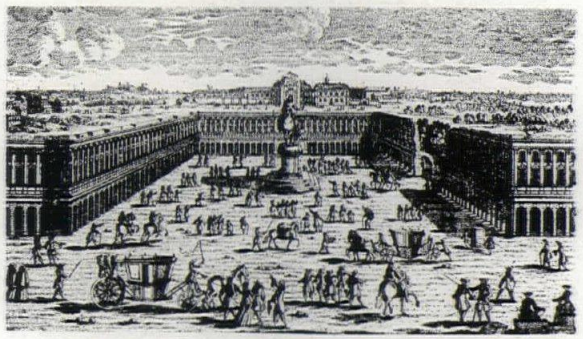
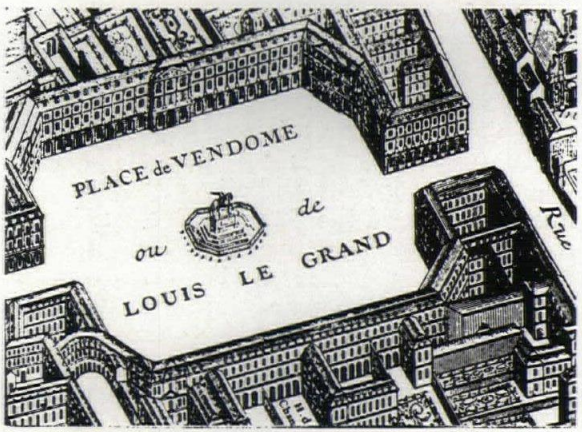


Figure 18

Figure 19



them in mind when we turn to the design of the Place de Vendôme as actually executed. The project of Louvois was abandoned, and the king instructed Mansart to make a new design for a site well north of the rue St. Honoré and much smaller in its dimensions. Mansart proposed a square place which, after many delays, was carried out as shown in Figure 19—still another detail from the Turgot Plan. But even then there was one important deviation from the conception of the architect: the street leading from the rue St. Honoré was continued through the place to the Boulevard des Capucines—and the great monument of Mansart, mise-en-scène for the Roi de Soleil, became the busiest traffic center in Paris. And the facades of the buildings that face the place have retained no trace of that Roman grandeur proposed in the original scheme. They are, indeed, perfunctory: the commonplace rendering of Perrault's subtle colonnade of the Louvre.

You will remember perhaps that Perrault built his colonnade without giving it any logical relationship to the structure which it masked. Both of Mansart's designs for the Place Vendôme followed this precedent, shocking to the functionalist. Louvois suggested, somewhat vaguely, that the arcades of his place might serve as facades for public buildings—a library, an academy, a city hall—and when the present place was built Louis instructed his architect to build only the fronts of the surrounding buildings. These stood alone until, piece by piece, the land behind them was sold to individual owners each of whom built a house to suit himself—but respecting, to this day, the desire of the king for an exterior uniformity.

The Place de Vendôme was completed in 1691. It was not until 1748 that the people of Paris again requested the king of France for permission to erect his statue as a wit-

ness of their love. The king, Louis XV, gave his consent—and the witness of the people's love is the great **Place de la Concorde**.

Louis, wishing to avoid all appearance of favoritism, decided to select an architect in a "grand competition" in which all the architects of Paris might participate. A monument situated in a place was the only mandatory element in the designs submitted in this competition, and each architect was left free to choose the site in Paris most suitable for his design. The most celebrated architects of the city—Soufflot, Boffrand, Contant and many others—submitted plans.

Many of these are shown in one of the most remarkable engravings published in France during the eighteenth century: the last plate (Figure 20) of Pierre Patte's *Monumens érigés en France à la gloire de Louis XV*—a book of prime importance in the study of civic design in Paris. The engraver—one of the most accomplished of his time—shows us what Paris might have been like if all of the designs for the new place could have been carried out. He shows us also the wide importance that the art of civic design had assumed in the life of architecture.

Unfortunately all of the designs involved the destruction of existing property and the acquisition of new land, and this was the reason given by the king for the rejection of all the designs. Louis then gave to the city a piece of land, property of the crown, and announced a new competition for the design of a place to be laid out upon it.

This site lay between the Tuileries Garden and the royal park known as the Champs Elysées. Although this park, purchased by Henri IV, had been formalized by the great avenue of Le Notre and by the beautiful tree-lined promenade that Marie de Medici built along the bank of the Seine, the land now set aside for the new place had been left without any kind of formal treatment. It seems to have been waste ground. It looks, as shown on the Turgot Plan, as if it were awaiting the hand of an architect.

About twenty designs were submitted in the second competition; but the Marquis de Marigny, director of the competition—and brother of Madame de Pompadour—rejected them all. He preferred a design of his own. Then the king, who was not without wit, announced that he had rejected the design of the marquis; and Louis instructed his own architect, Ange Jacques Gabriel, to design the place, commanding him to make a "reunion" of all the best points in the designs of his competitors. "This command," writes Pierre Patte, "caused some disatisfaction among the architects of Paris."

Whatever may be said of this strange history, it is probably true that no architect better competent for this great enterprise could have been found than Ange Jacques Gabriel. He did indeed take some ideas from the other competitors; but the broad conception of the scheme was his own (Figure 21). Perhaps that conception was suggested to him by the design of the Piazza del Popolo: the piazza, or place, to be treated as the forecourt of a city and the city itself to be masked by twin buildings guarding its entrance. But the twin buildings of Gabriel were not churches but palaces. And since the entrance to Paris (along the rue Royale, between the twin palaces) did not lie opposite the approach to the city along the avenue that crossed the Champs Elysées, it was necessary to lay out two axes. One of these, entering the place from the west, was extended across the place into the Tuileries Garden; the other, at right angles to the first, was carried northward to meet the facade of the new Madeleine Church, soon to be constructed. At the point where these axes met,

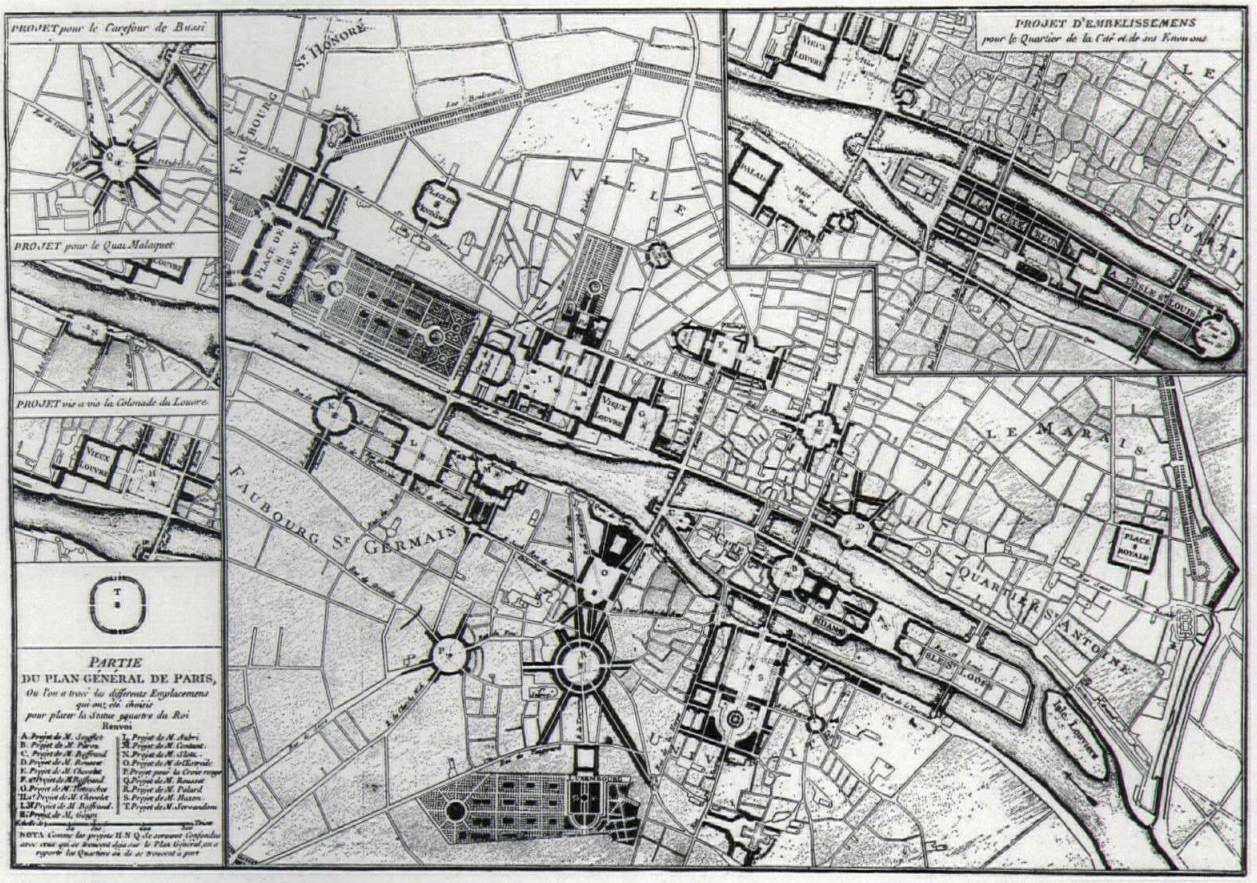


Figure 20

Gabriel placed the statue of the king.

No more magnificent site for a statue could be imagined: the immense unencumbered space, 750 feet by 500 feet, enclosed by balustrades and dry moats, the superb vistas leading off in so many directions, the beautiful plantations, the river views, and the noble frontages of the twin palaces. The palaces were, like the facades in the Place de Vendôme, only masks covering a number of varied plans—appliqués, as if they stood on the stage of a theatre. But those who consider that a grievous fault have not, I am afraid, understood the spirit of the Renaissance.

I have included, as Figure 22, a sketch of the Place de la Concorde (then Place Louis le Grand) which was made only ten years before the outbreak of the Revolution. This sketch seems to me to convey vividly the

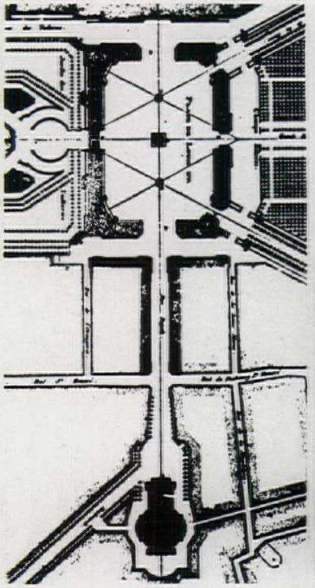


Figure 21

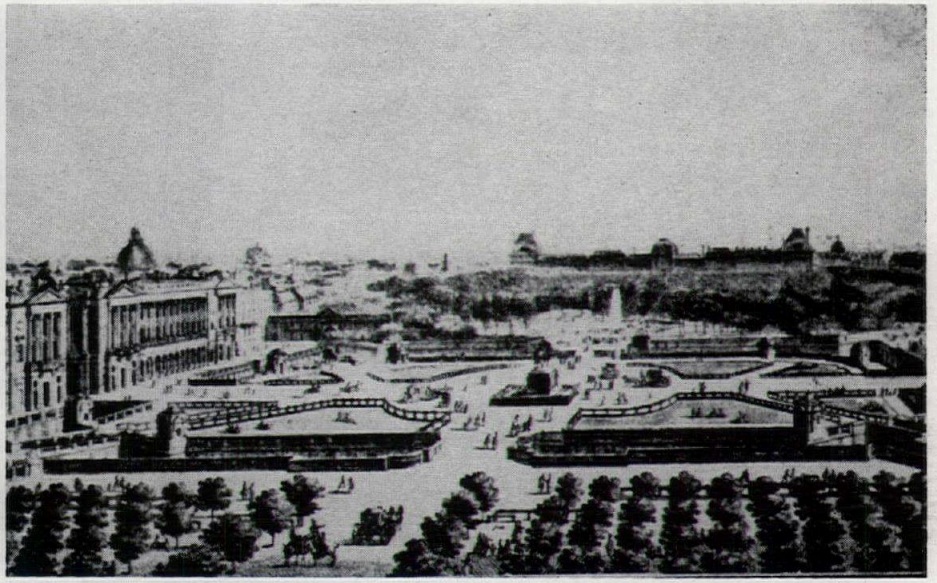


Figure 22

feeling of firm boundary and enclosure which distinguished the tradition of the *place* and at the same time a feeling of unity with the vast progressions of this environment. The work escaped somehow that episodal quality which made the place, and the piazza, merely oases of order in turbulent cities. The Place de la Concorde seems to belong to all of Paris.

The statue of Louis was torn down in August 1792, on the day after the capture of the Tuilleries. The guillotine was set up on the site of the statue. The moats were filled up and in the course of time the architect Hittorf "with a disregard of the original design little less than brutal" raised at the center the obelisk of red granite given to Paris by the Viceroy of Egypt. Two fountains were added, statues of the cities of France placed at the corners, and the existing sea of asphalt made the place ready for the motorized age.

But the Place de la Concorde, strange to say, is still beautiful.

LONDON

If we are not too precise in our definitions we can think of civic design in London as having two distinct styles: *neo-classic* and *baroque*. Both of these were imported from Italy where they had reached their last stages of development before they were brought, in the form of engravings, books and travelers' sketches, to London. Thus it happened that neo-classic and baroque architecture, which followed one after another in Italy as successive phases of the Renaissance, could exist side by side in London. Neither arose gradually through transitions from an English medievalism. They owe their beginnings to the enthusiasms of learned men steeped in the literature of architecure.

By the term *neo-classic* I mean that quality of geometric order, restrained and reposeful in effect, which is "proportioned according to the rules"—the rules of the Italian masters. This is the quality that we usually associate with Georgian architecture. By the term *baroque* I mean that quality of order which is plastic and freely modeled, dramatic in expression and varied with individual invention and caprice. This is the quality that Georgian architecture achieves when its theme is the spire of a New England church.

I do not pretend that these definitions are exact or that they are scholarly. I think that they may help us in a brief view of civic design in London.

The character of baroque design in London was established by Christopher Wren—the perfect example of a learned architect. He discovered his art in books and developed it through the firm disciplines which his intellect imposed upon his ardent imagination. The baroque tradition that became in time integral to English art is his unique and personal achievement.

In this triumph Wren was assisted by the very opportune fire that in 1666 destroyed the medieval city of London. If that incredible fire, burning through eight days of devastation, had not laid in ruins the great cathedral and the ancient parish churches, the public buildings and the fine houses of the merchants, the accumulated wealth of furnishings in cathedral, church and dwelling—we should not have the baroque cathedral of Christopher Wren, set on its pedestal above the city, or the fifty slender, modeled spires that rise around it from the sea of the city's roofs.

I do not know to what extent Wren was conscious of having designed a city; but I do not think that such an achievement could have been wholly accidental. It is true that the aspect of this new London resembles that of the medieval city as this is revealed in the fine engraving of Hollar: the spires of the many churches echo the great spire of the cathedral like psalmodists around a mitred precentor. But all of these, as we see them in old engravings and paintings—the painting, for example, that I have introduced as Figure 23—have a wholly new character. Rising behind the palaces of the aristocracy that line the river as far as Westminster and above the gay barges that, as if in Venice, cover the water with color and humanity, they have become cataracts of light and shade. London has thrown off its medieval veil of fear. It is a smiling city.

Figure 23

London in the eighteenth century was crowded with buildings in this happy fashion. There were not only the spires of the new churches that decorated every street, or stood at the end of every vista, but there were public buildings, such as the new Royal Exchange, extravagantly modeled, and the exquisitely ornamented facades of St. Bartholomew's Hospital. Baroque architecture in London seems to have acquired—if that be credible—an intimate quality. There is very little in St. Paul's to remind us of its Roman parentage.

Almost all of this baroque London lay within that part of London which was surrounded by the Roman wall—the part destroyed in the great fire of 1666. But London in the meantime was expanding far beyond that ancient precinct. Especially the city was expanding westward, covering with new constructions the open country which, until the time of the Stuarts, had lain between the city and Westminster. And it was in this area—to which the name West End has been given—that there developed that kind of Renaissance design which I have called neo-classic. Architecture and civic design in the West End had little to do with baroque exuberance. The West End was decorous, reticent and proportioned according to the rules.

Late in the sixteenth century many aristocratic families, or families with aristocratic pretensions, acquired estates in the area lying west of London, and this area, as far north as Hyde Park, had become covered with such estates when in the seventeenth century the city of London began to expand in the direction of Westminster. The owners could scarcely fail to see the opportunities for profit which this expansion might afford them nor did they long resist that opportun-

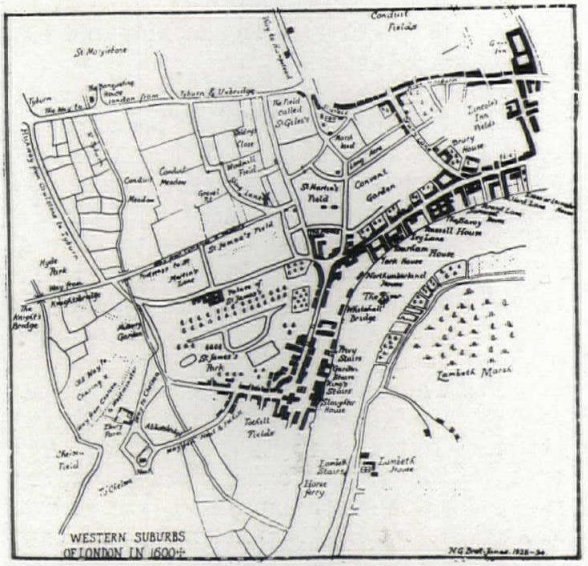


Figure 24

ity. One after another the estates lying west of London were laid out in new streets and covered with thousands of new houses. And from this development there arose, partly occasioned by social and economic circumstance peculiar to London and partly by the genius of English architecture, an art of civic design of unique excellence.

The theme of this art is not unlike that of civic design in Rome and Paris. In the West End of London, as in Rome and Paris, the designer is chiefly concerned with an open space and with the buildings that are grouped about it. But in London this space is—with a single exception—called, not a piazza or a place, but a square. The story of the squares of London forms a delightful chapter in the history of civic design.

I have included among my illustrations (Figure 24) a plan of the West End of London as this district existed in the year 1600. The edge of London is shown at the upper right hand corner. Near the bottom of the plan are shown the governmental buildings at Westminster. Extending between these are shown the many palaces of great feudal lords who govern England. And north of Westminster there is shown the piece of land already known as St. James Park on which stand, as they do today, the buildings which once belonged to the Convent of St. James and which, since the time of Henry VIII, have been the residence of the kings of England.

The land on which there was developed the first London square lies immediately north of the line of palaces extending along the river: the land known as Covent Garden. This comprised seven acres which had belonged to the Abbey of St. Peter. This had been confiscated by Henry VIII and given, in 1552, to a certain John Russell, a London merchant who had been of great use, either in war or love, to the king; and the king, in a further expression of his gratitude — a strange virtue in kings — created Russell Earl of Bedford. On the property the earl built a fine country house.

About the year 1630, when London had expanded so far westward as to surround partly this estate, the fourth Earl of Bedford asked permission from Charles I to use a part of his ground for building purposes. The permission was given and the earl, with a tact becoming to a courtier, asked the king's architect, Inigo Jones, to prepare a plan for the development of the area. Jones, who had learned all his art in Italy, proposed that there should be a piazza dominated by a church in the form of a Roman temple. Encouraged by Charles, the earl laid out the piazza and built the church.

Thus there was formed the type which was destined to be imitated nearly a hundred

times in the rapid and luxurious growth of London's West End. Each estate, as the tide of the city swept over it, was developed for new houses in such a way that they enclosed at least one square—a word which describes a rectangular piece of land set apart as a garden in the manner established by the **Covent Garden Piazza** of the Earl of Bedford.

The popularity of this pattern was caused, in part at least, by the great success of the Covent Piazza. The first civic design—for such it was—built in the Renaissance manner, it offered its aristocratic patrons a new and beautiful fashion, already accepted at court. The houses built around the garden were stately houses, decorated with pilasters and a classical cornice, and raised upon an arcade in the manner of the Place des Vosges, recently completed in Paris. They were all built, as in the Place des Vosges, in the one pattern provided by the king's architect; but each tenant (the houses were rented, not sold) might build behind his facade a house suited to his own way of life. And when all of the houses on two sides of the square had been leased (those on the third side were not built until after many years) new rows of houses, separated by party walls, were built along new streets regularly laid out on all sides until the earl's property, except for a part reserved around his own country house and garden, was covered by houses. These houses were inhabited for more than a hundred years by the highest society of London.

Covent Garden Piazza is shown in the eighteenth century engraving reproduced as Figure 25. You will notice here a curiosity: the vegetable market which, after 1671, occupied the southern half of the garden. Here were the stalls and shed which according to Pepys "rang with street cries and overflowed with cabbage leaves." The presence of these did not seem to disturb the fashionable tenantry of the houses.

The first estate to be developed in the manner established by the Earl of Bedford was that of the Earl of Leicester. Begun in 1635 —only five years after Covent Garden — **Leicester Square** may be taken as typical of London Squares. In the eighteenth century engraving which I reproduce as Figure 26, you will note the country house of the earl, set back somewhat from the houses of his tenants, but facing the public garden laid out before it. There is not, as in Covent Garden Piazza, a fine architectural conception: no porticoed church or rhythmical arcades. The houses, although conforming to a type established by the earl's architect, are permitted many deviations from normalcy; the owner was more interested in the quality of his tenants than the distinction of his architecture. The scheme is essentially a productive enterprise: practical, built by private enterprise, and except in a commercial sense, unimaginative. The generous income which now flowed into the pockets of the noble lord no doubt consoled him for the loss of his stately gardens and wide vistas.

The beauty of the squares of London arose not so much from individual character as from the pattern which as a whole they laid, like some rich carpet, over the west of London. Squares are bound together by the long strips of uniform houses and tree-lined streets. An enclave of quietude and dignity into which "the weariness, the fever and the fret" of commerce and politics may not enter. But did they enter? Well, the man of the Renaissance believed that he could deny admission to the cares of this world (other than that of finding a suitable husband for his daughter) by merely forgetting them. Certainly that brave illusion is

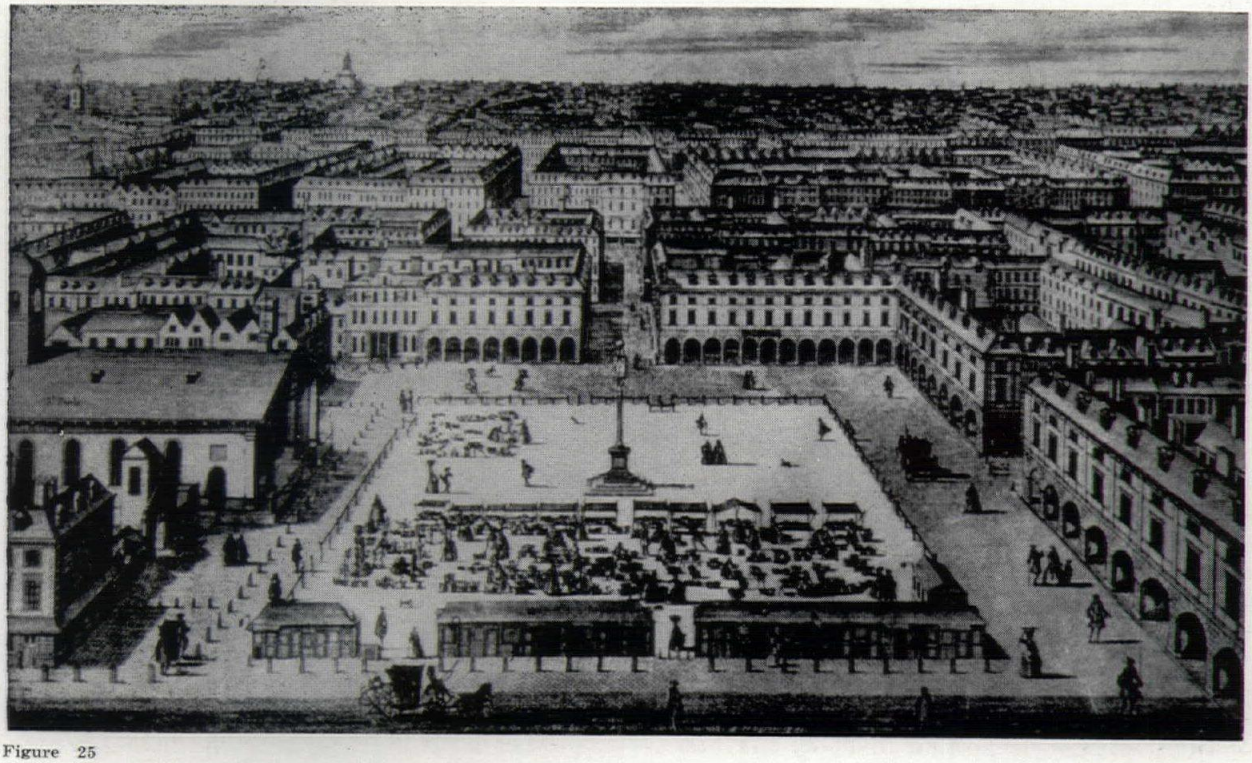


Figure 25

Figure 26

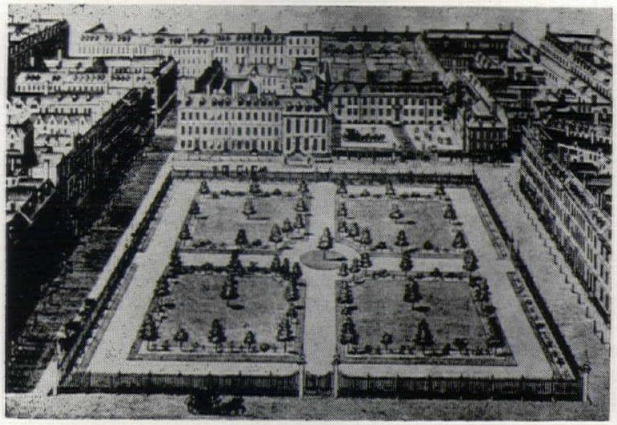


Figure 27

implied by his literature and his architecture.

London developed a unique type of town-house around her squares. These had their origin in the medieval houses of London which had narrow street frontages but plans which often extended deeply into the blocks. After the great fire these houses were separated by party walls of brick—and the law requiring brick facades was gradually enforced. The high wooden roofs, obviously a fire hazard, were given up with the advent of classical taste. When to these changes there was added the formal order and correct detail of the Italian precedent a kind of house peculiarly English had come into being.

This kind of house was perfectly adapted for the enframement of a London square. It fitted like a glove the taste of those who lived in that environment. Where decorum and conformity to social pattern are the ideals, an eccentricity in the design of a house would be as intolerable as an eccentricity in formal dress. Architecture was never more correct, never more in the fashion.

But fashions change. Late in the eighteenth century it became evident that the English town-house had become intolerably stereotyped. Perhaps the economic changes which brought into being so many sudden fortunes brought with them some new need of expression. And of course there were architects ready to encourage a new clientele to new adventure.

The essential characteristic of the change which then occurred might be described as a return to monumentality—and to romance. Classical architecture was rediscovered. It was seen that the salient qualities of ancient architects were neither baroque fantasy or neo-classic correctness but a certain grandeur and universality which seems to have escaped the Georgian architect. Churches then began to be built with porticoes copied from Roman temples (the precedent of Inigo Jones being remembered) and the facade of the new Bank of England assumed a sobriety and breadth to which London had been long unaccustomed. The time came when triumphal arches could be built in the city's vistas and the Duke of York could be honored with a column imitated from that of Trajan. Historians give to this architecture—the last phase of the Renaissance—the name Classical Revival.

The new monumentality was soon evident in the squares of the West End. It was discovered that a row of houses, separated by invisible party walls, could be made to look like a great palace. These could stand around a public garden, not as a ribbon of repeated facades, but as a single building exhibiting the breadth and grandeur of a public building. This could be done, for example, by treating the first storey as a continuous pedestal upon which the superstructure rests; by the use of streamlinings in cornices and attic storeys; by projecting forward the houses at the center of the group and at the ends (to give a sense of weight) ; and, finally, by decorating the central feature, and perhaps the end features also, with columns symbolic of a classical taste. To a row of houses thus designed London gave the designation terrace.

The **Adelphi Terrace** (Figure 27), raised along the river on enormous subterranean vaults, is the most famous of these "dreams of antique architecture." The vaults, extended to the river bank, end in a facade of Roman arches such as the architect, Robert Adam, might have seen at Spalato and raise a terrace of houses, built to resemble a palace, against the sky. Had such a design been repeated along the Thames as far as Westminster—as the architect intended—civic design in London might have attained a new heaven of imaginative grandeur.

PRINCIPLES OF ART CRITICISM

Dr. J. P. Hodin

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1.

Aesthetic theories and theories of art criticism are dependent to a high degree on the main trends in philosophic thought of their own time; dependent insofar as they express, in a different sphere of experience, the same intellectual problems as philosophy, thus showing that the spirit of a time is a whole and a medium which cannot be avoided by those who live in it. Art and philosophy in their striving for timeless values are marked by their own times. The Germans like to speak in this connection of the "Zeitgeist".

Certain leading critics like Benedetto Croce in literature and Lionello Venturi in art stressed the creative side of the critical activity. The critic, they said, is himself a creator in dealing with the work of art, as the artist is creative in connection with life and artistic tradition. In a time when there exists a work like that of Picasso, reflecting in its different phases all the possible formal languages used by mankind since the cave age, *i.e.* for many thousands of years, this aspect seems to gain more and more support. But we are compelled to make a distinction between the ideas of criticism and its realities. Art may remain creative even if it is nourished more from the works of art of previous periods than from nature, for it gives essentially a new synthesis; but criticism, however sensitive it may be, remains essentially an analytical process. And the analytical process is the opposite of the creative process. Whereas criticism cannot live without the work of art, it is certain that art can and does exist without any direct reference to philosophy. But not without reference to criticism. An artist without this critical faculty is unthinkable. Creation as a process includes the critical as well as the analytical approach. Some thinkers have expressed the idea that art is probably the most genuine human experience and more direct than any abstract thinking. In using the shapes of nature, symbols, images, signs, ciphers of Being, art works more directly than any thought process using abstract terms. The formative will manifested in nature and the formative will manifested in the work of art are analogous. Both express themselves through forms, and forms, therefore, and their interrelations are the highest, the purest, the most convincing and understandable language of man, whereas thought on or about forms only leads to speculation, and thought refraining from the consideration of form follows other aims, *i.e.* technical, economic, scientific, philosophical, literary, etc.

A long and fertile period in modern creativeness seems to be declining now. It was the period of the heroic conquest of new means of expression. Circumstances released, in modern man, energies which enabled him to give an adequate image to a changed world. This spirit of "conquest" has prevented many artists from developing beyond an experimental and theoretical stage whilst their ideas have been taken up by others and developed. Together they have created the new art, manifesting thus a will towards cultural cooperation which is the sign of real culture in spite of the fact that each artist has stressed his own "personal" style. In a time when artists became adventurous and theoretical, the critic was more needed than ever before. But he failed. He failed for two reasons. First, because he was too vain to change his traditional attitude of representing the "ideal" public, so to speak, with its conservative taste, and too comfortable to seek a closer contact with those strong personalities who in spite of all difficulties and misunderstandings strove in their loneliness for their art, for their inner life. This has not been taken seriously enough by the modern critic. Time had first to prove that the works of van Gogh, Gauguin, Cézanne, Munch and others represented the eternal values compared with which the outspoken enmities of their contemporaries, responsible for so much of the tragedy of their life, seem to us today not worth mentioning. Secondly, the critic of these decisive years failed because he did not realize that the artist already expressed, albeit perhaps unconsciously, the cultural crisis of industrial civilization. And instead of joining the living forces they joined the dead phalanx of classical or romantic aestheticism. Later, when young people from all over the world streamed to Paris, the interest in the *-isms* and their representatives was widely spread and there arose a generation of art critics who, in fighting for modern principles in their own countries, could already build on firm ground, on a "modern tradition" established in France. England had its Roger Fry and its T. E. Hulme, Germany its Herwarth Walden and Julius Meier-Graefe, Austria Hermann Bahr, Bohemia F. X. Salda, Sweden August Brunius, Norway Jens Thiis, Spain José Ortega y Gasset. Thiis fought for Edvard Munch, for the experiment in art and a new ethics of criticism, Walden for everything modern, Meier-Graefe for the Impressionists, for el Greco and van Gogh, Fry for the Post-Impressionists, Brunius for the Swedish generation of Fauvists, Ortega y Gasset for the acceptance of the trend towards the "dehumanization of art." The artists of the following generation were more fortunate than their predecessors. They gained recognition even during their lifetime, since the collecting of and dealing with modern art had developed rapidly owing to the real interest in the new trends shown by such people as Ambroise Vollard, Uhde, Kahnweiler, Pellerin, Gertrude Stein, Guggenheim, and others. They enlisted the services of writers on their behalf and themselves wrote on art and the artists.

After the First World War there was a period when every intellectual believed that a new phase had arrived in European culture; a new life—an *incipit vita nova*—had begun

in architecture, in art, in literature, in music, in dance, in psychology and sociology, and everything had to be new or not at all. The newer it was the better it was. And then also, and perhaps therefore, *il faut épater le bourgeois!* What the French artists had done already in the 'eighties. This generation believed in change for its own sake, in the revolution of the new against the old, an abstract attitude which has led to the deplorable and uncritical situation of the new being proclaimed as a value in itself, independently of its artistic quality. The other extreme in modern criticism was thus reached. And so it came about that the names of second and third-rate artists could become famous all over the world. Looking through old *avant-garde* reviews today we realize that only a few names have survived.

2.

At this moment in the development of contemporary art when we have a breathing space in which to look backward and to observe what the new movements, beginning with Impressionism, have really contributed to enrich art, it is not only useful but necessary to arrive at a critical attitude to contemporary criticism. Naturally, if the only demand made of art criticism is that it shall be a mouth-piece for the art dealer, it remains to a great extent a question of journalism. Here we may well quote what Jules Lemaitre once wrote about it: "In journalism it is only the question of striking hard. There need be no care for the truth of one's thought, for the genuineness of one's feelings, for any exactness of expression. After all, there is no time to think!" We believe that the question of art criticism is more profound. Recently, and especially in America, reference has been made in the circles of art historians and aestheticians to the crisis in contemporary criticism. This so-called crisis in criticism as it is summarized by Mr. A. Kaplan, professor of philosophy at the University of California in Los Angeles, shows itself to be the old problem of objectivity in criticism. The Americans demand of criticism that it be as objective as is science. The way in which this problem is dealt with has, however, much more to do with the science of logic than it has with art. Art is life, and criticism is good if it is able to detect the innate life in the work of art. Anatole France said in the preface to *La Vie Littéraire*: "There is no more an objective criticism than there is an objective art and all those who boast that they include something else in their work except themselves are victims of the most deceitful philosophy. The truth is that one is never able to get away from oneself. We are enclosed in our personality as in a lasting prison. It seems to me therefore that the best we can do is to recognize this bitter fact willingly and to confess that we talk about ourselves every time we have not the strength to keep silent." In other words, criticism says as much about the critic as it often fails to say about the work of art. Good criticism depends always on the personality of the critic and the question is, therefore, not so much who is criticized but who

is criticized by whom. Subjective criticism would of course be without any significance for us if it were not for certain objective elements, which make criticism into something worthy of its name. In our time which shows such a formidable tendency towards specialization in science, the science dedicated to art has not been able to escape this evil. As is only natural, or should one rather say in this connection "unnatural"?, it has led to the separation into three distinct fields of knowledge of the organic trinity of art history, art theory (aesthetics) and the valuation of art which is criticism, whereas in fact none of these can be said to exist apart from the others. It will be the privilege of our time to find the way back from a merely analytical and specialized point of view to a spiritual one. This process is obvious already in all branches of scientific thought. Art history, which has been dominated for some time by the conception of natural science, has been freed from it. The art historian who today only classifies without evaluating the work of art can be considered a monstrum. Again, making valuations without an aesthetic philosophy—and that there are different schools: Burckhardt, Dessoir, Wölfflin, Dvorak, Riegl, Lalo, etc., does not need to be enlarged upon—is impossible; it leads to a valuation exclusively on the basis of personal feelings with all the relativity which this implies, down to the lowest level of art criticism, namely the invective of the ignorant.

The best spontaneous criticisms contain all elements as an organic whole, and the most "creative" ones have been achieved by artists themselves (Leonardo, Vassari, Raphael, Mengs, Goethe, Delacroix, van Gogh, Baudelaire, the brothers Goncourt, Flaubert, Gautier, Proust).

3.

If, then, we ask what the elements good art criticism must contain we can answer: a description of the work, its theme, motif, conception, and a formal and stylistic analysis drawn in the perspective of art history, without which no critic can have the right means of valuation and comparison. Criticism without valuation is no criticism at all. The terms used in criticism must reflect a unified view and be derived from an aesthetic philosophy which today is less concerned with the metaphysical problem of ideal beauty but is rather an empiric, psychologically-founded orbit of knowledge with the emphasis on a universal consciousness of art forms as exemplified by the writings of Malraux, for instance, and on creativeness itself. I quote only Klages, C. G. Jung, and Gestalt psychology in this context. Whereas in former times the critic wrote for the connoisseur rather than the layman, the present time has burdened him with the responsible and very difficult task of educating a broad public which has lost its natural contact with art, accelerating its liberation from prejudices and inhibitions, defending new values, fighting against the commercialization of art, influencing taste (as Brunetière said so wisely: "to teach people to judge often against their own taste") and making art a means of revitalizing an overmechanized life.

THE ARTISTS

George Bireline

Instructor in Design. B.F.A. Bradley University, Peoria, Illinois. Graduate Work University of North Carolina, 1951. Technical Director, Raleigh Little Theatre. Geodesics, Inc. Exhibitions: Chicago, Springfield, Youngstown, Philadelphia, New York, South Bend, Washington, D. C., Raleigh. Awards: Winner 1952 N. C. Art Scholarship competition, 1st Prize Oil, Michiana Regional. Purchase Award: N. C. State Artists Show One Man Show. Alabama College. 1957, New Talent in USA, Art in America.

Joseph H. Cox

Associate Professor of Design. B.F.A. John Herron Art Institute, 1938. M.F.A. University of Iowa, 1941. Studied with Fletcher Martin, Emile Ganso, Jean Charlot, Philip Guston. Teaching experience: University of Iowa, University of Tennessee. Directed the summer school at Tarpon Springs, Florida, for the University of Florida. Exhibitions: World's Fair, San Francisco, 1939; Carnegie International, University of Illinois Summer Show, Memphis Biennial; High Museum, Atlanta; Painting of the Year Exhibition; Shaw Gallery, New York, and other local and regional shows and private collections. Honors: Tiffany Scholarship, 1941; Indiana Artists, First Prize, 1939; Fourth Memphis Biennial, Second Prize, 1952; Painting of the Year Exhibition, Atlanta, First Prize, 1955; Honorable Mention, 1956. Murals in Indiana, Michigan, Tennessee; most recent an exterior mosaic mural on North Greenville Junior College in South Carolina.

Enrique Montenegro

Assistant Professor of Design. B.F.A. University of Florida. 1 year Graduate Study, Art Students League, New York. Taught—University of New Mexico; Denver Art Museum. Exhibitions—Denver Art Museum, Colorado Springs, Kansas City. New Talent in U.S.A. sponsored by Art in America magazine 1955.

Herbert B. Simon

Instructor in Design. Graduate of New York University; studied at the Brooklyn Museum Art School—1948-50; Hans Hoffman School—1950; Colorado Springs Fine Arts Center—1953-54; exhibited in the University of Pennsylvania "Cultural Olympics—1954"; "Recent Drawings, U.S.A."—Museum of Modern Art—1956.

Duncan Robert Stuart

Associate Professor of Design. Studied at University of Oklahoma, Chouinard Art Institute, Yale University (Weir Scholarship). Teaching: Waterbury Art Institute, University of Oklahoma, University of Michigan. Creative work: painting, sculpture, graphic arts, experimental structures, mathematics. Exhibitions: Chicago, New York City, Seattle, San Francisco, Colorado Springs, Denver, Ann Arbor, Richmond, Dallas, Atlanta Tulsa, Oklahoma City, Raleigh, and traveling exhibitions. Honors: Oklahoma Artists Annual, 1st prize graphic arts 1947-48; Chicago Art Institute Invitational Annual 1948; Metropolitan Museum of Art 1st Contemporary Annual 1950; Contemporary Painting Annual, Whitney Museum of Art 1951. Purchase awards: Seattle, Denver, 1948, North Carolina State Annual 1950-51. Trustee and Fellow, Fuller Research Foundation; Co-director, N. C. Division, Fuller Research Foundation.

Three Color Engraving By Durham Engraving Co., Durham, N. C.

R-157 56" x 40" 1956
George Bireline
Collection of the Artist

Time and Tide 48" x 36" 1957
Joseph H. Cox
Collection of the Artist

ORDER AND STRUCTURE IN SCIENCE AND ART

Dr. Charles E. Gauss

Elton Professor of Philosophy, George Washington University. Author: *The Aesthetic Theories of French Artists, 1855 to the Present*, 1949. Visiting Professor of Philosophy, School of Design, 1957.

The popular mind usually thinks of art and science as completely antithetical. Science, it says, investigates the nature of the physical world; art is free creation. Science gives us knowledge; art presents us with an object for enjoyment. Science demands that we abstract out of experience those properties that are universal; art demands our attending closely to what is unique in each experience. Art stays on the perceptual surface of things; science penetrates to their conceptual interior. When we do not understand science we are awed by its prestige and admit our own ignorance. When we do not understand art we are outraged that the work of art should be such as it is.

This view, like all popular ideas, is too neat in its distinctions. Best tradition has always repudiated it. An ancient Greek, like Plato, used the two words interchangeably. Leonardo did not think of himself as a two-headed monster, now scientist, now artist. Both art and science flow from a common source and have a similar intent, and one should not emphasize the difference between them until one has understood their similarities.

Art and science are both human activities by which we seek to impose order on the world of experience, and to state in some schematic form the results of our explorations of its possible structures.

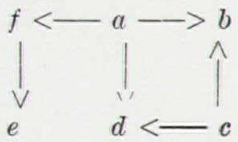
The Concept of Structure

We have an order of elements when there is some understandable principle of relationship among them. Given the properties of some elements the properties of others can be inferred. The organization of employees and customers in a large store is an ordered organization. A crowd is usually not ordered. A design is an order of elements. If I draw a star I need only use five lines. By drawing a line of fixed length, turning an angle of 36° and continuing the line, turning again an equal angle in the same direction, and so continuing I shall eventually terminate at my starting point with a closed figure of a star. There was a repeatable order to the procedure; the steps of the procedure followed in a definite sequence. There is a serial order whenever the relations among the elements are connected, asymmetrical, and transitive. The relation is connected when, for

any two elements, x and y, the relation R holds for either x R y or y R x. The relation is asymmetrical when it holds for x R y but not for y R x. If x R y and y R z so x R z then the relation is transitive. Whenever we have a relation that meets these requirements we have an ordering relation for a set of elements. Points on a line are so ordered by "being to the right of," numbers are ordered by the relation of "successor of."

A connection of ordered elements gives us a system. Two systems are said to have the same structure when they have a similarity of relations. That is, relation R in system A is echoed by relation R′ in system A′. A map, and what it is a map of, are two such similar systems; the architectural plans and elevations for a building and the actual lay-out of the building itself along the ground and in elevation are two such similar systems. The illustration of the map is a particularly enlightening one. Suppose the map be a contour map, showing various elevations by the use of various shades of green, the shades from dark green to light green having the same order of relations between them as various heights of elevations (within certain steps, say, hundreds of feet above sea level). The similarity is the result of a conventional selection of shades, but such a selectior could not be made unless greens could be ordered in a relationship of "lighter green than." The similarity is also the result of a conventional selection of steps of elevation from sea level, but here again elevations can be ordered by relation of "higher in altitude than."

Suppose we take another example. Here are the elements a, b, c, d, e, f, and the relation R. What the elements or the relation are we need not say, but we can state the system a R b, a R d, a R f, c R b, c R d, and f R e. We may then proceed to give two interpretations of this system. If the elements represent individuals and the relation is "in debt to" then I know a owes money to b, d, and f, c owes b and d, and f owes e. We may also diagram this as follows:



The diagram is another interpretation. Both interpretations have the same structure. They are isomorphic to each other.

Art and Science as the Organization of Experience

A work of art is a system of relations that is an interpretation of some structure. We "read" the work of art and thence discover the structure of what is depicted. In a realistic painting the forms in the painting are arranged in a system similar to the arrange-

ment of the three-dimensional forms in the natural object depicted. The colors are arranged in accordance with the order they display in nature. Colors and two-dimensional spatial forms are capable of being ordered in series in relation to size, being-to-the-right-of, being-above, hue, saturation, light-and-dark. These orders may be considered within themselves without any thought to their referring to subject-matter or content, which as orders they certainly do not. We may then combine the items of each of the orders in various complex ways to result in a "music" of the painting. Such is the structure of a non-objective painting, and the structure that it is an "interpretation" of is then the structure of possible orders of certain properties existent in the world and abstracted out of it. Ordering and structuring always involves abstracting from the gross stuff of experience; they are functions of the organizing power of human being.

The human being is an organizing being. All he does reflects this. In all experience there is an active participation of the experiencer. He participates at least by selecting what he shall pay attention to in the gross stuff before him. Experience is never a passive thing in which the world is given to us in some "real" state. Experiencing is selecting certain aspects to attend to. (That we always experience certain aspects and not a "given" world is clearly illustrated by the Impressionists, who, though they thought they were recording the world simply as it was to the retina of the eye, discovered a world of refracted and reflected lights where the objects are dissolved in a play of color of pure pigments.)

We select our world at a practical level by paying attention to certain things before us as indices, signals for behaviour. We attend to this thing, disregard that; avoid this obstacle, use that object. Some objects right within our immediate sight are nevertheless on the fringes of our attention.

A trait of human beings is to move from this behavioural level to the scientific and artistic levels. We do by concentrating on other aspects of the gross stuff of experience. When we operate with scientific intent we abstract, that is pay attention only to, those qualities which we can represent in statements that are unconcerned with date and locale. We generalize to descriptions. When we operate with artistic intent we look for an order in the perceptual qualities. We abstract those qualities that we can present in perceived designs. Art is as much an abstraction from the everyday world as is science. The abstraction is simply of different properties. The long harangue in the history of aesthetics over the meaning of art as "imitation" attests to the recognition of art as an abstract world in some relation to a "natural" world.

When operating with artistic intent we do not always merely look at the structure of given experience, any more than in science we always look at the structure of the given world. In mathematics, plane geometry for instance, we explore the structure of relations of possible worlds of "spatial" relations not experienced but imposed in an ideal

world. A geometric system is a schematic presentation of our exploration of such a world. Similarly, in art we need not always present content of a definite subject-matter; we may also explore the orders of qualitative relations and express these in a structure of purely formal relations of colors, shapes, lines, planes, etc. in a painting. If the ordinary person can be docile in his acceptance of the legitimacy of mathematics he should be docile in his acceptance of non-objective art. On the other hand, if there are, besides mathematics, sciences that are empirical, one should also recognize the legitimacy of subject-matter art.

Art as an Experience

A work of art is the result of the human organization of an experiencer, and this experiencer is sometimes the artist, sometimes the spectator. We are so prone to think of the work of art as a physical thing or process (a musical performance) that we fail to see a transaction with a spectator experiencer is necessary to actualize this potential object into a living work of art. John Dewey clearly recognizes this when he speaks of the spectator as recreating the work of art.

Any identifiable actuality depends upon a transaction with an experiencer. The physical world, for instance, is a potentiality realized by human perception in the ordinary world of physical things, or realized by conception in the theoretical structure of physics. The hard, still, brown table on which I am writing is not a different table from the largely empty, moving, colorless concatenation of atomic particles of the table of physics. Each is a realization of the world on a different scale.

An animal, when confronted with a painting, does not see a work of art. He does not respond to the complex organization as a structured design because he deals with things in experience only as signals for action. There must be a human experiencer, capable of dealing with things as schemas before the work of art becomes actualized as such.

If we bring nothing of our intent to experience of a physical work of art, this work remains a blank for us; it is simply not actualized. The importance of recognizing this for criticism cannot be overestimated. It is equally important for explaining why so often new art fails to be comprehended. The fault is not with the work itself but with the experiencing spectator who has not found the "key" to the structural design. This is often the case with so much modern art, because it does not trouble to present a public "key" and frequently leaves the spectator to forge his own.

Many keys might fit a work of art to make it vital. There is an example of this in an anecdote told by J. B. Blackmur about his interpretation of Wallace Stevens' poem, "Emperor of Ice Cream." Blackmur, feeling that probably his interpretation was at fault sent it to Stevens before publishing it. Stevens replied that he never had such an inten-

tion in mind, but that such an intention was a perfectly legitimate interpretation of the poem. In other words, he realized that a structure can have different interpretations.

Materials and Structure in Music, Painting, and Poetry

A study of structure involves inspecting the basic materials and how they are ordered; the relations of the ordered items to one another, which give what is usually called the form; and the relation of this form to the external conditions, for a form is always the result of an interplay of external forces on a plastic material. Let us apply this three-step examination to three of the arts and see what such an approach suggests to the artist and the spectator.

The basic natural materials from which music is made are sounds. But this stuff is musical material only when we look at it as organized into scales and schemes. Scales are an ordered selection of sounds from the gamut of sounds according to some serially ordering relation like "higher than in pitch." But there are also scales for intensity and duration of sound. Schemes are the harmonic grammar of tonal and chord relationships. In music these scales and schemes are based on the mathematical properties that tones have in relation to one another. The potentialities of mathematical combinations in music are what make music such a powerful "language," capable of an expressive power right within the development of the basic material that exceeds that of the other arts. Music is a mathematics made concrete. A scalar selection or an harmonic scheme are systems selected from a wealth of possibilities. Our western system has been based on the simplicity of "natural" relations, suggested by overtone relations and by the pleasingness of some combinations. But, mathematically considered, there is no reason to suspect that any conventional system selected would not do as well insofar as the selection allowed for a variety of combination. We should have to get used to it, of course, but that would be expected.

To many people the organized sound materials of music are its only content, though it is admitted that this content can arouse feelings, images, and associations. Music is abstract, not representational. To others, music has a non-musical subject-matter, it is the expression of feelings, or the imitation of things sounding in the everyday world. If music is the language of feelings, then it is too subtle a language even for a dictionary. If music represents anything by imitating the sound of it, then at best it can represent only abstract patterns that suggest. The sounds of Paris traffic in Gershwin's *American in Paris* are not literally repeated. The note patterns are cues for recognition. In this, music is in no different situation than words are when we try onomotopoetic imitation. When was such an expression a literal imitation? Or do roosters, for instance, speak in different languages, when they say *cock-a-doodle-do* in English and *kickerikoo* in German? Any imitation is a caricature, a more sharply drawn formalized schema. Music

may be representational then, though only to a small degree. It is abstract and formal systematization for the most part.

What is the basic material for painting and can we find scales and schemes in this art? Colored pigments are our material, and we can arrange colors on a color cone or color wheel according to hue, value, and saturation. Ostensibly, our colors used are selections from the gamut of possible colors with their accompanying properties. We can get scales; but do we have developed schemes of color harmony in painting? It does not seem that we do as in music. We still tend in painting to improvise our schemes, to work according to "intuition" rather than by a grammar. This is not to be condemned. It only suggests that here we may be in a limiting condition and that the expressive potentialities that might be realized by a formal grammar of color go largely unexplored. Work with a color organ involves interesting considerations of color schemes.

On the other hand, painting, except for very recently, has been almost exclusively concerned with representation. Yet here again we see that there is no pure representation, that representation and abstraction are merely relative poles of ideal contrast. If we look at the history of nineteenth-century French painting we can see that the realistic concern itself is what brought painting to abstraction. The early realists, such as Courbet and Manet, changed the kind of subject-matter painting should depict from ideal to "natural" subjects, from goddesses and nymphs to peasant girls and courtesans. The Impressionists grew "scientific" in their concerns, worrying about the relation of the painted object to the object in the world. They were anxious to paint the object as sensed (for the belief was that the sensed object was more real than the interpreted object.) So they pursued the object as given in sensation, the *lighted* object until the physical object dissolved and the light became patterns of fragmented colors. The road to realism had led to abstraction. Abstraction depends upon some principle of order of materials. In painting it has usually been not so much an order of color as of shapes. If we skip thirty years after the Impressionists to look at the abstractions of Braque and the early cubists we find color disappearing from the canvas. The range of the color usually is from black through greys and browns to white. The cubists are interested in shape. From the Impressionists through the present non-objectivists the ordering is seldom on the basis of mathematical relationships. It is usually on the basis of analogy to the painter's feeling, or of intent to startle or intensify by "unnatural" color. What results is not so much system as the groupings of free-association.

Spoken sounds are the basic material of poetry. There is nothing here that can be ordered in scales. Schemes of sounds, too, are limited to such relatively weak structuralizing components as rhyme, assonance, alliteration, labial, palatal sounds and such. None of these properties manifest serial relations. A pure poetry of structure seems impossible and the music of poetry remains no more than titilation of sound. But spoken

sounds by convention symbolize ideas and images. Though there are no serial orders possible for ideas, except in temporal succession, there are grammatical rules for combining meaningful units and conventions for relating these ideas as they occur in logical sequence, in psychological association, or through some adopted scheme of analogy to theme and variation, recurrence of motif. Here in poetry we see even more clearly than in painting that the representative dimension can supply material for abstract organization in formal structure. Though we cannot make a complex structure of sounds in poetry we can make a complex formal music with the symbolized images and ideas.

The Potentialities of Interchangeable Structures

What I am suggesting are the potentialities of "cross fertilizations" among the arts. The old romantic confusion of the arts is but a baby step in this direction and a false one, confusing the subject matter of one art with that of another. The cross fertilizations I have in mind may proceed at the level of the scalar and schematic organizations of the basic materials, or at the level of the general pattern of a work. Type patterns, for instance, are fruitful devices.

Something of what I mean may be seen in a simple way when one looks at the attempts people in other arts have made to adapt and utilize the devices and forms of music. The device of counterpoint, of the simultaneous use of two or more themes, has been subject to experimentation in literature. Thomas Mann, it seems to me, uses a fine analogue of counterpoint in his *Dr. Faustus,* where his story is the story of Leverkuhn, the composer, or Faust, and of Germany at the same time. As to the application of a musical form to literature, Marcel Proust's "Un Amour de Swann" in his *Du Côté de Chez Swann* has been beautifully analyzed as an application of the sonata form to the novel. (See the *Yale French Studies,* vol. II, no. 2). Whether Proust thought of his novelette as a sonata does not matter. It may be viewed as such and so viewing enhances our understanding of it. The critic who points out what others may not see and so enhances our understanding at the same time is increasing our appreciation, for with greater understanding of structure there is greater appreciation.

Working with the problem inherent in the transfer of form and organizational principles from one art to another opens up interesting possibilities. The structure of the sonata and the structure of Proust's novelette are hence identical. We have a beautiful example of isomorphism and interpreting systems. When one stops to think of the wealth of suggestion inherent in pursuing the interpretation of a structure in two media, it is strange it is not pursued more. What was the problem of the transmission of words by wire or of music by recordings but a problem of similar structure in sound vibrations and vibrations of physical materials and electrical impulses? The problem of television was to construct a device that would present the structure of electrical impulses in a

pattern of light waves in similar order on a receiver screen. In every one of these cases what was realized was how to present an order in two modalities. If there can be an ordered similarity of relationships between electrical impulses and light waves and electrical impulses and pitches and intensities of sound why not explore the relationships between light and sound for a "painting of sound" and a "music of color"?

The cross fertilization may even be extended. Not only may one art fertilize another but one field may suggest analogues to another field. I have tried to show in my *Aesthetic Theories of French Artists* * how the philosophical explorations of the problems of knowledge and the explorations by artists in the nineteenth century of the relation of art to the natural world are identical concerns. What the philosopher concerned himself with through analysis and explanation the artist concerned himself with as a technical problem of the use of pigments. One field may be the key that unlocks another. By developing the hypothesis of structural identity between some problems in gravitational attraction and some problems in electrostatics Maxwell came to his electromagnetic theory of light. Today historians like Toynbee try to use the key of biology to explain history. A mere metaphor we say; a culture does not have a life cycle as a biological organism does. But who can say that the metaphor may not suggest the very order we are seeking or the order we may with some success impose? The relation of a growing tree to cantilever construction found inherent in the plastic potentialities of concrete suggested a whole new wealth of architectural development. The atomic rearrangements that take place in a chemical reaction can suggest the pattern of a dance. Imagination in art and science is the finding of new applications for old orders. No new problems will ever be solved nor will old problems ever find new solutions if we fail to explore imaginatively the suggestions of structural relations among varied fields.

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