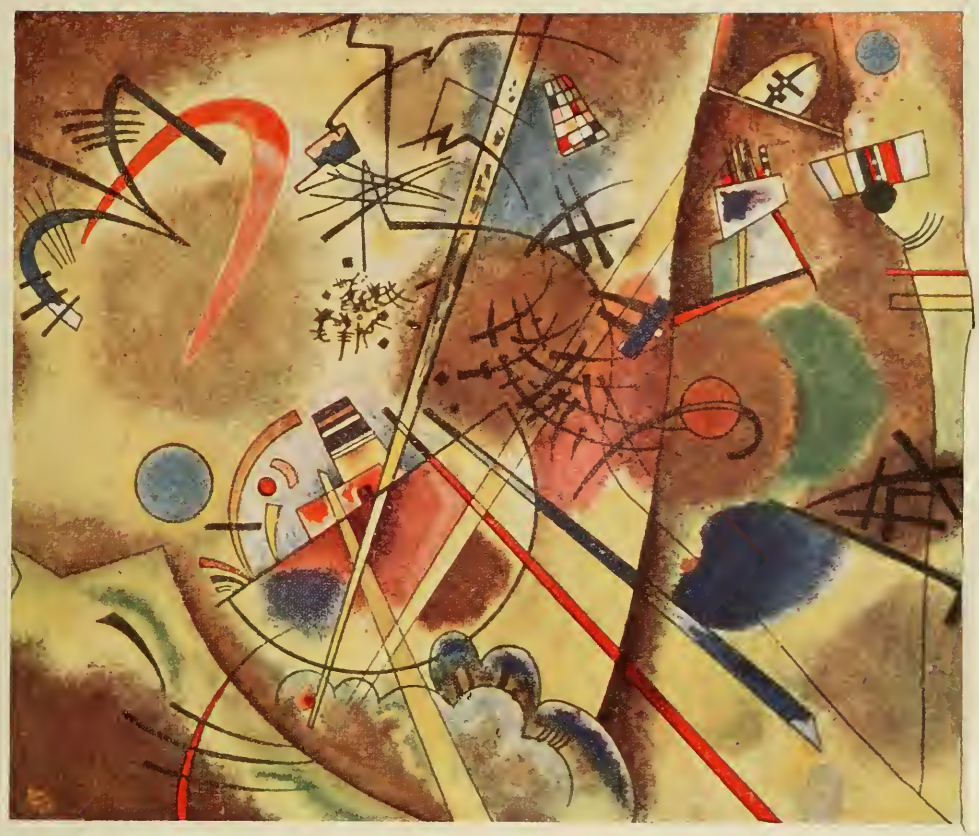

POINT AND LINE TO PLANE

BY WASSILY KANDINSKY

LINE

The geometric line is an invisible thing. It is the track made by the moving point; that is, its product. It is created by movement—specifically through the destruction of the intense self-contained repose of the point. Here, the leap out of the static into the dynamic occurs.

The line is, therefore, the **greatest antithesis** to the pictorial proto-element—the point. Viewed in the strictest sense, it can be designated as a secondary element.

Origin

The forces coming from without which transform the point into a line, can be very diverse. The variation in lines depends upon the number of these forces and upon their combinations.

In the final analysis, all line forms can be reduced to two cases:

1. application of one force and
2. application of two forces:
   a) single or repeated, alternate action of both forces,
   b) simultaneous action of both forces.

Straight Line

I A. When **a force coming from without** moves the point in any direction, the first type of line results; the initial direction remains unchanged and the line has the tendency to run in a straight course to infinity.

This is the **straight line** whose tension **represents the most concise form of the potentiality for endless movement.**

For the concept "movement," which is used almost everywhere, I have substituted the term "tension." The customary term is inexact and thereby leads us down the wrong roads and is the cause of further terminological misconceptions. "Tension" is the force living within the element and represents only one part of the creative "movement." The second part

is the "direction," which is also determined by the "movement." The elements of painting are material results of movement in the form:

1. of the tension, and
2. of the direction.

This division creates, furthermore, a basis for the differentiation of various kinds of elements as, for example, point and line. Of these, the point carries only one tension within it and it can have no direction; the line definitely shares in both the tension and the direction. If, for instance, the straight line were to be investigated from the standpoint of its tension alone, it would be impossible to distinguish a horizontal line from a vertical. The above holds equally true in connection with colour analysis, since some colours are to be distinguished from others only in the directions of their tensions.[1]

We note that there are three typical kinds of straight lines of which other straight lines are only variations.

1. The simplest form of the straight line is the **horizontal.** In the human imagination, this corresponds to the line or the plane upon which the human being stands or moves. The horizontal line is also a cold supporting base which can be extended on the level in various directions. Coldness and flatness are the basic sounds of this line, and it can be designated as **the most concise form of the potentiality for endless cold movement.**

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1 See, for example, the characterization of yellow and blue in my book "Uber das Geistige in der Kunst," R. Piper & Co., Verlag, Munich, 3rd Edition, 1912, pp. 73, 76, 77 and Plates I and II. [This book has recently been translated into English and reissued under the title "On the Spiritual in Art" by the Solomon R. Guggenheim Foundation, New York City, and this particular reference will be found on pages 60 to 64, incl.] A cautious use of these concepts is especially important in the analysis of "form in drawing," since it is right here that direction plays a definite role. It is to be observed with regret that painting is least well provided with an exact terminology which renders scientific work exceedingly difficult and sometimes quite impossible. One must start here from the beginning and a dictionary of terminology is a necessary preliminary. An attempt at this was made in Moscow about 1919 but has achieved no results. Perhaps the time was not then ripe.

2. In complete contrast to this line, in both an external and inner sense, is the **vertical** which stands at right angles to it, and in which flatness is supplanted by height, and coldness by warmth. Therefore, **the vertical line is the most concise form of the potentiality for endless warm movement.**

3. The third type of straight line is the **diagonal** which, in schematic form, diverges from both of the above at the same angle and, therefore, has the same inclination to both of them; a circumstance which determines its inner sound—equal union of coldness and warmth. Therefore, **the diagonal line is the most concise form of the potentiality for endless cold-warm movement** (Figs. **14** and **15**).

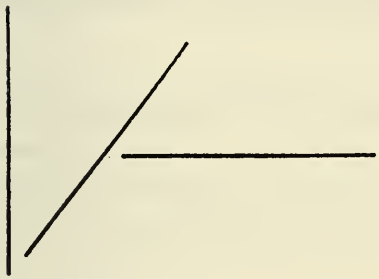

Fig. **14**
Basic types of geometric straight lines.

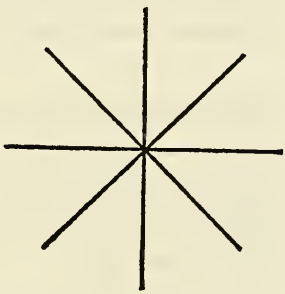

Fig. **15**
Diagram of basic types.

Temperature

These three types are the purest forms of straight lines and they are differentiated from each other by **temperature:**

Endless movement.	1. cold form, 2. warm form, 3. cold-warm form.	Most concise forms of the potentiality for endless movement.

To a greater or smaller extent, all other straight lines are only deviations from the diagonal. The differences in a greater or lesser tendency to coldness or to warmth determine their inner sounds (Fig. **16**).

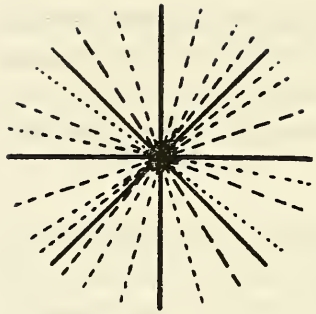

Fig. **16**
Diagram of deviations in temperature.

In this way is formed the star of straight lines which are organized about a common meeting-point.

Plane Formation

This star can become ever denser and denser so that the intersections form a more compact center, in which a point develops and seems to grow. This is the axis about which the lines can move and, finally, flow into one another; a new form is born—a plane in the clear shape of a circle (Figs. **17** and **18**).

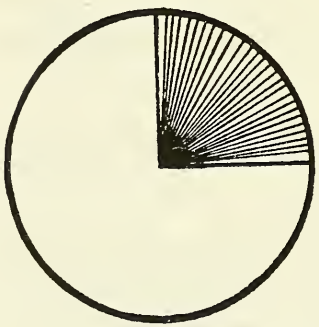

Fig. **17**
Condensation.

Fig. **18**
Circle as result of condensation.

It may be remarked briefly, that in this case we have to do with a special characteristic of the line—its power to create a plane. This power expresses itself here in the same manner that a shovel creates a plane with the incision-like lines it cuts into the earth. Moreover, the line can by still another method produce a plane, but of this I will speak later.

The difference between the diagonals and the other diagonal-like lines, which one could with justification call **free straight lines,** is also a temperature difference as the free straight lines can never attain a balance between warmth and coldness.

Free straight lines can, thereby, lie upon a given plane with a common center (Fig. **19**), or lie outside of the center (Fig. **20**); accordingly, they can be divided into these two classes:

4. **Free straight lines** (unbalanced lines):
   a) centric, and
   b) acentric.

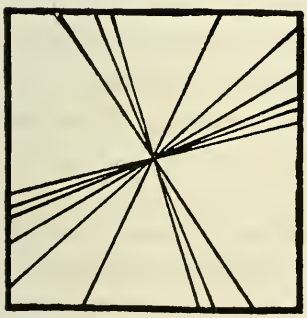

Fig. **19**
Free straight lines, centric.

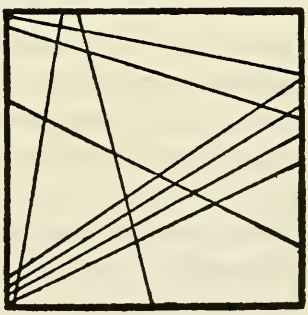

Fig. **20**
Free straight lines, acentric.

Colour: Yellow and Blue

The acentric free straight lines are the first straight lines to possess a special capacity—a capacity which they share to a degree with the "colourful" colours, and which distinguishes the latter from black and white. **Yellow** and **blue**, especially, carry within them different tensions—tensions of advancing and retreating. The purely schematic straight lines (horizontals, verticals and diagonals—but especially the first two), develop their tensions **on** the plane and exhibit no inclination to leave it. In the case of free straight lines and, above all, the acentric ones, we observe a loose relationship to the plane: they are less completely fused with the plane and seem to pierce it occasionally. These lines are farthest removed from the point, which claws itself into the plane, since they especially have abandoned the element of rest.

In the case of the **bounded plane**, this loose relationship is possible only when the line lies freely on it; that is, when it does not touch its outside boundaries. This will be discussed at greater length in the chapter "Basic Plane."

At all events, there is a certain relationship in the tensions of the acentric free straight lines and those of the "colourful" colours. The natural connections between the "graphic" and the "pictorial" elements, which we can to some extent recognize today, are of immeasurable importance to the future theory of composition. Only in this direction, can planned exact experiments in construction be made in our laboratory work, and the mischievous fog in which we are today condemned to wander, will certainly become more transparent and less suffocating.

Black and White

When the typical straight lines, principally the horizontals and verticals, are tested for their colour characteristics, a comparison with **black** and **white** forces itself, logically enough, upon our attention. Just as both of these colours (which until recently were called "non-colours" and which today are somewhat ineptly termed "colourless" colours) are silent colours, both of the above mentioned straight lines are, in the same manner, silent lines. Here and there, the sound is reduced to a minimum: silence or, rather, scarcely audible whispering and stillness. Black and white lie outside

of the colour wheel.[1] Horizontals and verticals occupy a special place among lines because, when in a central position, they cannot be repeated and are, therefore, solitary. If we examine black and white from the standpoint of temperature, we find white more apt to be warm than black and that absolute black is inwardly unquestionably cold. It is not without reason that the horizontal scale of colours runs from white to black (Fig. **21**):

Fig. **21**

A gradual, natural sliding-downward from above to below (Fig. **22**).

In addition in the case of white and black, the elements of height and depth can be noted as coinciding with vertical and horizontal.

"Today" human beings are completely absorbed with the external; the inner is dead for them. This is the last step of the descent, the end of the blind alley. In former times, such places were called "abysses;" today the modest expression "blind alley" suffices. The "modern" individual seeks inner tranquility because he is deafened from outside, and believes this quiet to be found in inner silence. Out of this, in our case, has come the exclusive preference for the horizontal-vertical. The further logical consequence would be the exclusive preference for black and white, indications

1 See "On the Spiritual in Art," where I call black the symbol of death and white, of birth. The same thing can with complete justification be said about the horizontal and the vertical—low and high. The former is lying; the latter is standing, walking, moving about, finally climbing upward. Supporting—growing. Passive—active. Relatively: feminine—masculine.

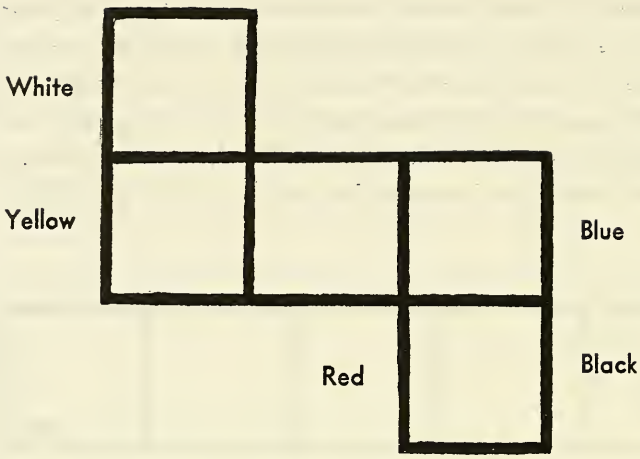

Fig. **22**
Graphic representation of the descent.

of which have already appeared several times in painting. But the exclusive association of the horizontal-vertical with black and white has still to take place; then everything will be immersed in inner silence, and only external noises will shake the world.[1]

These relationships, which are not to be understood as wholly equivalent values but, rather, as inner parallels, may be arranged in the form of a table such as the following:

[1] A strong reaction is to be expected to this exclusiveness, but it will not be in the form of seeking refuge in the past as is, to some extent, the case today. The flight into the past has been frequently in evidence during the last decades—Greek "Classic," Italian Quattrocento, the later Rome, "primitive" art (including "wild beasts"); now, in Germany—German "old masters," in Russia—the icons, etc., in France—discreet looking backward from "today" to "yesterday," in contrast to the attitude of certain Germans and Russians who descend into the profound depths. The future seems empty to the "modern" human being.

Graphic Form.	Pictorial Form.
Straight Line:	**Primary Colours:**
1. horizontal,	black,
2. vertical,	white,
3. diagonal,	red (or grey, or green),[1]
4. free straight line.	yellow and blue.

Red

The parallel: diagonal—**red** is here advanced as an assertion, the detailed proof of which would lead too far afield from the subject of this book. It may only briefly be stated: red[2] is distinguished from yellow and blue by its characteristic of lying firmly on the plane, and from black and white by an intensive inner seething—a tension within it. The diagonal reveals this difference from free straight lines: that it lies firmly on the plane; and this difference from horizontals and verticals: that it has a greater inner tension.

Proto-Sound

The point resting in the center of a square plane was defined above as the harmonizing of the point and the plane, and the total picture designated as the prototype of pictorial expression. A horizontal and vertical in a central position on a square plane would constitute a further complication of this case. These two straight lines are, as has already been said, things living solitary and alone, since they know no repetition. They therefore develop a strong sound which can never be completely drowned out and, thereby, represent the **proto-sound of straight lines.**

---

1 Red, grey and green, in certain relationships, can be placed on a parallel with each other: red and green—transition from yellow to blue; grey—from black to white, etc. This belongs in the field of colour theory. Suggestions concerning this are to be found in "On the Spiritual in Art."

2 See "On the Spiritual in Art," pp. 69 and 70.

This construction is, consequently, the **prototype of linear expression** or, of linear composition (Fig. **23**).

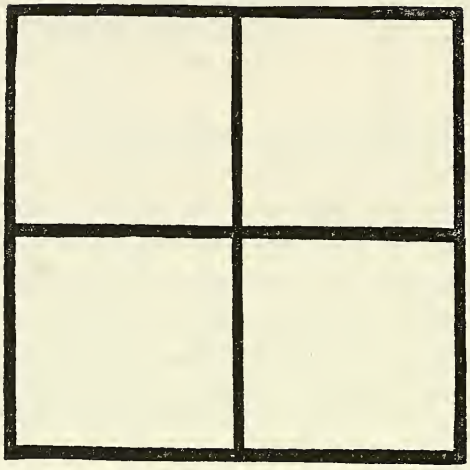

Fig. **23**

It consists of a square divided into four squares, the most primitive form of the division of a schematic plane.

The sum of the tensions, consisting of 6 elements of cold rest and 6 elements of warm rest = 12. Therefore, the next step from the schematic point picture to the schematic line picture is reached through a surprisingly great increase of the means: a single sound is powerfully amplified to 12 sounds. These 12 sounds, on the other hand, consist of 4 sounds of the plane + 2 sounds of the line = 6. The combination has doubled these 6 sounds.

This example, which is really part of the theory of composition, was given here with the intention of suggesting the reciprocal effect of the simple elements in elementary combinations, where the expression "elementary" —in an imprecise, flexible sense—reveals the "relativity" of its nature.

This means that it is not easy to fix a limit for the complex and to use the elementary exclusively. Nevertheless, these experiments and observations offer the only means of getting to the bottom of pictorial things which serve the ends of composition. This method is employed by science itself, and has thereby attained—despite excessive one-sidedness—a primarily external order and continues today with the aid of keen analysis to forge its way through to primary elements. In this manner it has, after all, placed before philosophy a rich and well-ordered body of material which—sooner or later—will lead to synthetic results. The science of art must travel the same road, in the course of which, however, it should from the very outset unite the external with the inner.

The Lyric and the Dramatic

During the gradual transition from horizontal to free acentric lines, the cold lyric character is transformed into an ever warmer one until it finally acquires a certain dramatic flavor. The lyric quality, nevertheless, remains dominant. The entire field of straight lines is lyric, a fact which can be explained by the effect of a single force from the outside. The dramatic (and in the cases mentioned, the acentric) carries within it—aside from the sound caused by relocation—the sound of collision as well, for which at least two forces are necessary.

The action of two forces in the realm of the line can take place in two ways:

1. the two forces alternate with each other — alternate action,
2. the two forces act together — simultaneous action.

It is evident that the second process is more temperamental and, thereby, "hotter," especially since this process can be looked upon as the result of the action of many alternating forces.

Correspondingly, the dramatic effect mounts, until at last purely dramatic lines come into existence.

Thus the realm of lines embraces all the expressive sounds from the cold lyric in the beginning, to the hot dramatic at the end.

Linear Translation

Of course, every phenomenon of the external and of the inner world can be given linear expression—a kind of translation.[1]

The results corresponding to the two categories are:

	Forces:	Products:
Point	1. two alternate,	angular lines.
	2. two simultaneous,	curved lines.

Angular Lines

I B. Angular Lines.

Since angular lines are composed of straight lines, they belong under heading I and are placed in the second class under the heading B.

Angular lines originate from the pressure of two forces in the following manner (Fig. **24**):

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1 Aside from intuitive translations, systematic laboratory experiments should be made in this direction. It would be advisable to investigate first the lyric or dramatic content of every phenomenon chosen for translation, and then to seek in the corresponding linear realm, a form suitable to the given case. Furthermore, an analysis of the already existing "translated works" would throw a strong light on this question. There are numerous examples of such translations in music: musical "pictures" derived from natural phenomena, musical form for works of other arts, etc. The Russian composer, A. A. Schenschin, has made extremely valuable experiments in this direction—"Années de Pélérinage" by Liszt which relates to Michael Angelo's "Pensieroso" and Raphael's "Sposalizio."

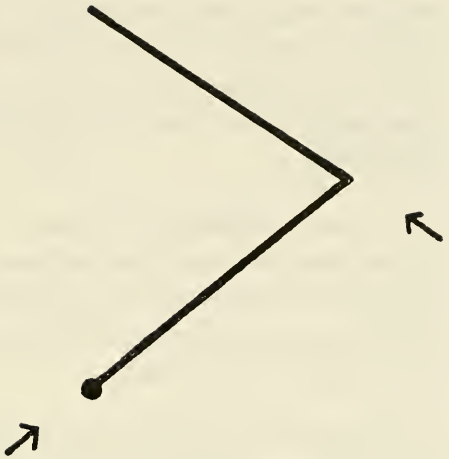


Fig. **24**

I B 1. The **simplest** forms of angular lines consist of two parts, and are the result of two forces which have discontinued their action after a single thrust. This simple process leads, moreover, to an important difference between straight and angular lines: the angular line is in much closer touch with the plane, and it already carries something plane-like within it. The plane is in the process of creation, and the angular line becomes a bridge. The differences between the countless angular lines depend entirely upon the sizes of the angles, in accordance with which they can be divided into three typical groups: **Angles**

a) with acute angles — 45°
b) with right angles — 90°
c) with obtuse angles — 135°
The remainder are atypical acute or obtuse angles, and deviate from the typical in the number of their degrees. Thus, with the first three angular lines, a fourth—an atypical angular line—can be included.
d) with a free angle,
because of which this angular line must be designated as a free angular line.

The right angle stands unchangeable in size but is able to change its direction. There can be only 4 right angles which touch each other—they either touch with their points and form a cross or, by the touching of their diverging sides, they form right-angle planes—in most instances creating the square.

The horizontal-vertical cross consists of one warm and one cold line—it is nothing other than the central position of the horizontal and vertical. This accounts for the cold-warm or warm-cold temperature of the right angle, depending upon its direction. Details concerning this will be given in the section entitled "Basic Plane."

Lengths

The further difference between the simple angular lines consists in the lengths of the individual sections—a circumstance which greatly modifies the basic sound of these forms.

Absolute Sound

The **absolute sound** of the given forms depends upon three conditions, and changes as follows to:

1. sound of straight lines with above-mentioned changes (Fig. **25**),
2. sound of the inclination to a more or less acute tension (Fig. **26**), and
3. sound of the inclination to a smaller or greater conquest of the plane (Fig. **27**).

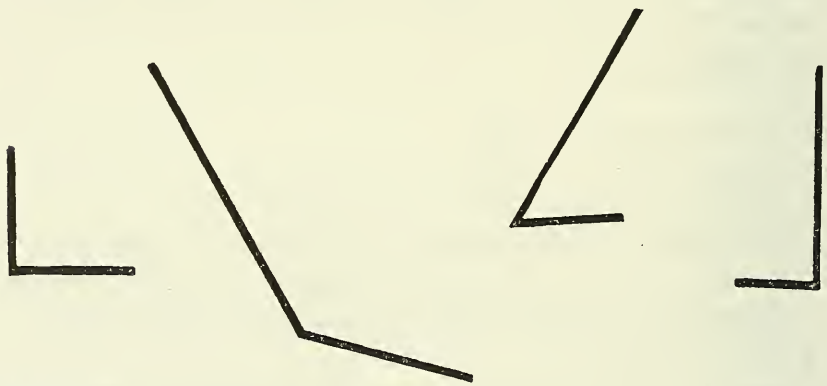


Fig. **25**
Examples of angular lines.

Fig. **26**

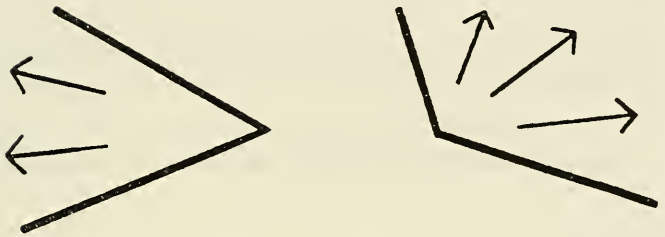


Fig. **27**

Triple Sound

These three sounds can create a **triple sound.** They can also, on the other hand, be used singly or in pairs—a matter which depends upon the construction as a whole. All three sounds cannot be entirely eliminated, but one or the other can out-sound the rest to such an extent that they can scarcely be heard.

The most objective of the three typical angles is the right angle, which also is the coldest. It divides the square plane into exactly 4 parts.

The acute angle is the tensest as well as the warmest. It cuts the plane into exactly 8 parts.

Increasing the right angle leads to the weakening of the forward tension and the desire for the conquest of the plane grows in proportion. This

greed is, nevertheless, restrained in so far as the obtuse angle is not capable of dividing the plane exactly: it goes into it twice and leaves a portion of 90° unconquered.

Three Sounds

The three different sounds of these three forms thereby correspond:

1. the cold and controlled,
2. the sharp and highly active, and
3. the clumsy, weak and passive.

These three sounds and, therefore, these three angles, give a fine graphic translation of the artistic process:

1. the sharp and highly active in the inner thought (vision),
2. the cool and controlled in masterly execution (realization), and
3. the unsatisfied feeling and the sensation of one's own weakness following the completed work (in the case of artists, called "hangover").

Angular Lines and Colour

We spoke above of 4 right angles which form a square. The relationships with the pictorial elements can only be briefly discussed here, but still the parallels of angular lines with colours must be indicated. The cold-warm of the square and its definite plane-like nature, immediately become signposts pointing to **red**, which represents a midway point between yellow and blue and carries within it cold-warm characteristics.[1] Not without reason has the red square appeared so often of late. It is not, therefore, completely without justification that the **right angle** is placed on a parallel with **red.**

Under class d) of angular lines, it is necessary to emphasize a special angle which lies between the right and acute angles—an angle of 60° (right angle – 30° and acute + 15°). When the openings of two such angles are brought together, they produce an equilateral triangle—three

[1] See "On the Spiritual in Art," p. 67, Figure II. Also, Table V in "Basic Elements" in the Bauhaus Book, Bauhaus Verlag, 1923.

sharp, active angles—and become the sign-post to yellow.[1] Thus, the **acute angle** has a **yellow** colour within.

The obtuse angle increasingly loses its aggression, its piercing quality, its warmth, and is, thereby, distantly related to a line without angles which, as will be shown below, constitutes the third primary, typical form of the plane—the circle. The passiveness in the **obtuse angle**, the almost missing forward tension, gives this angle a light **blue** tone.

In addition, further relationships can be indicated: the acuter the angle, the closer it approaches sharp warmth and vice versa, the warmth decreases toward the red right angle and inclines more and more to coldness, until the obtuse (150°) angle develops; this is a typical blue angle and is a presentiment of the curved line which, in its further course, has the circle as its final goal.

This process can be given the following graphic expression:

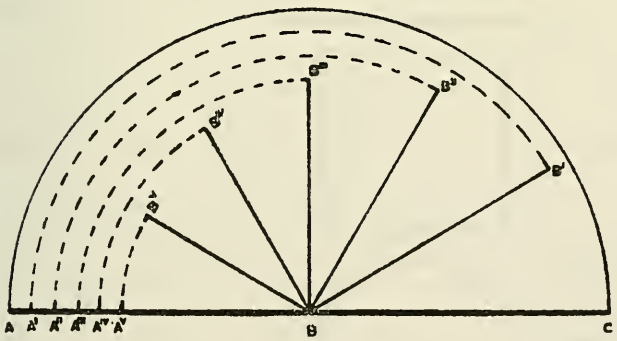


Fig. **28**
System of typical angles ⇄ colours.

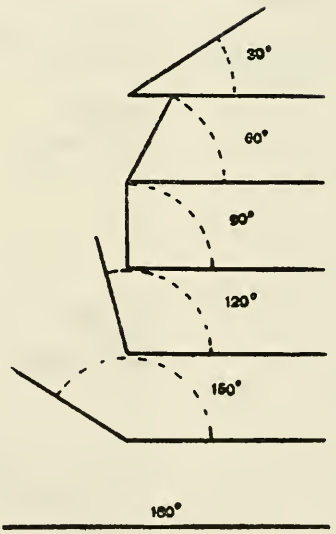


Fig. **29**
Angle measurements.

[1] Ibidem.

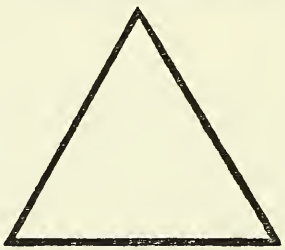
Thus it follows:

A^{V} B B^{V} . . . yellow,	Acute angle.
A^{IV} B B^{IV} . . . orange.	
A^{III} B B^{III} . . . red.	Right angle.
A^{II} B B^{II} . . . violet,	Obtuse angle.
A^{I} B B^{I} . . . blue.	

The next jump of 30° is the transition from angular lines to straight lines:

A B C . . . . black. Horizontal.

Since, however, the typical angles in their continued development can form planes, the further relationships between line-plane-colour arise automatically. We may therefore make the following **diagrammatic indication of the line-plane-colour relationships:**

Plane and Colour	**Angular Lines:**	**Primary Forms:**	**Primary Colours:**
Fig. **30** Acute angle	⇄		⇄ yellow
Fig. **31** Right angle	⇄		⇄ red
Fig. **32** Obtuse angle	⇄		⇄ blue

If the parallels just made are correct, the following conclusions may be drawn from a comparison of the two: the sounds and characteristics of the components produce, in certain cases, a sum of characteristics which are not covered in the first group. Similar facts are not unknown to other sciences, e.g., chemistry: the sum divided into its components in many cases fails to be restored in the combination of the components.[1] Perhaps, in such cases, one is confronted with an unknown law, whose vague appearance seems deceptive.

For example:

Line	**Colour**		**in respect to temperature and light**	**Line and Colour**
Horizontal	black	=	blue	
Vertical	white	=	yellow	
Diagonal	grey, green	=	red	

Plane	**Components**		**Sum gives the third primary**	**Plane and Components**
Triangle	horizontal black = blue	diagonal red	yellow	
Square	horizontal black = blue	vertical white = yellow	red	
Circle[2]	**Tensions** (as components) active = yellow passive = red		blue	

1 In chemistry, the equality sign is not used in such cases, but rather, a ⇄, which points to relationships. My task is to point out "organic" relationships between the elements of painting. Even in cases where it is impossible to establish identities, that is, to prove them conclusively, I will indicate their inner relationship by the use of two arrows ⇄. Furthermore, one must not in such cases be deterred by possible mistakes: the truth is not infrequently reached by way of error.

2 The origin of the circle will be described in the analysis of curved lines—attack and yielding resistance.
The circle is, at all events, a special case among the three primary forms—straight lines are unable to create it.

Thus, the sum would supply the missing factor necessary to balance. In this way, the components would be derived from the sum—lines from the plane—and vice versa. Artistic practice supports this professed rule in so far as black-white painting—consisting of lines and points—acquires a more pronounced balance by the addition of a plane (or planes, as the case may be): lighter weights require the heavier. This need is evident to a still greater degree in colour painting, a fact well known to every painter.

Method

My aim in considerations of this sort extends beyond the attempt to establish more or less accurate rules. It appears to me to be almost as important to stimulate discussion about theoretic methods. The methods of art analysis have been, until now, far too haphazard and, frequently, too personal in nature. The coming period demands a more exact and objective way to make collective work in the science of art possible. Preferences and talents remain different here as well as elsewhere, and the work accomplished by each person can be only in accordance with his powers. For this very reason, a work program accepted by many is of especial importance. Here and there arises the idea of art institutes working in a systematic way—an idea which will surely soon be realized in various countries. It can be maintained altogether without exaggeration, that a science of art erected on a broad foundation must be international in character: it is interesting, but certainly not sufficient, to create an exclusively European art theory. Geographic and other external conditions are not the important ones in this connection (at least not the only ones) but, rather, it is the differences in inner content of the "nations"—particularly in the field of art—which are, in the first instance, the deciding factor. A sufficient example of this is our black mourning and the white mourning of the Chinese.[1] There can be no greater contrast in feeling for

International Art Institutes

[1] Those differences which require exact examination, not alone in reference to "nation" but also to race, will surely be determined with no particular difficulty if the investigation is carried on exactly and systematically. Nevertheless, in matters of detail, which not infrequently acquire unexpected importance, it will often be impossible to remove insuperable obstacles—influences which often, in the beginning of a culture, affect details and lead in some cases to superficial imitations and thereby becloud further development. On the other hand, purely external phenomena receive little attention

colour—"black and white" is quite as customary with us as "heaven and earth." Yet out of this, a deep-lying, and consequently not immediately recognizable, relationship of the two colours can be discovered: both are silence. This example, therefore, perhaps sheds an especially strong light upon the difference between the inner nature of Chinese and Europeans. After thousands of years of Christianity, we Christians experience death as a final silence, or, according to my characterization, as a "bottomless pit," whereas the heathen Chinese look upon silence as a first step to the new language, or, in my way of putting it, as "birth."[1]

The "national" is a "question" which today is either underestimated or treated only from an external and superficial-economic standpoint; for this reason, its negative side comes strongly to the fore and covers up the other side completely. It is this very other side, that is, the inner, which is essential. From this last standpoint, the sum of the nations would form not a dissonance but rather, harmony. Presumably, art would also intervene in this seemingly hopeless case—this time in a scientific way—unconsciously or involuntarily, with harmonizing effect. The realization of the idea of organizing an international art institute can become an introduction to this.

Complex Angular Lines

I B 2. The simplest forms of angular lines can become complex when other lines join the two original ones. In this case, the point receives not two but, rather, several pushes which (for simplicity's sake) are derived from two, not several, alternating forces. The schematic type of these lines of many angles is composed of several segments of equal length which stand at right angles to each other. Accordingly, the endless series of many-angled lines becomes modified in two directions:

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in a systematic work and can in this kind of theoretic work be neglected which, naturally, would not be possible in the case of an exclusively "positivistic" approach. Even in these "simple" cases, a one-sided approach can lead only to one-sided conclusions. It would be short-sighted to assume that a people is "accidentally" placed in a definite geographic position which determines its further development. It would also be quite as insufficient to assert that the political and economic conditions which, in the final analysis, flow out of this people itself, guide and shape its creative power. The goal of a creative power is an inner one—this inner cannot be shelled out of the external alone.

[1] See "On the Spiritual in Art," p. 68.

1. through combinations of acute, right, obtuse and free angles, and
2. through various lengths of the segments.

Thus a **many-angled line** can be composed of the most diverse parts—from the simpler to the ever more complex.

Sum of obtuse angles, which have equal segments,
" " " " " have unequal segments,
" " " " " alternate with acute angles and have equal or unequal segments,
" " " " " alternate with right and acute angles, etc. (Fig. **33**).

Fig. **33**
Free many-angled lines.

Curved Lines

These lines are also called **zig-zag lines** and when they have equal segments, they form an animated straight line. When acute-angled in form, they suggest height and, thus, the vertical; when obtuse-angled, they tend toward the horizontal. The endless potentiality of straight lines for movement is always retained in the above-mentioned forms.

If, particularly in the case of the formation of the obtuse angle, a force is regularly augmented and the angle increases in size, this form tends toward the plane and, especially, toward the circle. The relationship of the obtuse-angle line, the curved line and the circle is, thereby, not only of an external, but of an inner nature, as well. The passivity of the obtuse angle and its unaggressive attitude toward its surroundings, causes it to cave in more and more until it ends in the profoundest self-absorption of the circle.

II. When two forces act upon the point in such a way that one force continually, but always to the same degree, exceeds the other in pressure, a curved line is created whose basic form is

1. **the simple curved line.**

It is really a straight line which has been brought out of its course by constant sideward pressure—the greater was this pressure, the farther went the diversion from the straight line and, in the course of this, the greater became the outward tension and, finally, the tendency to close itself.

The inner difference from the straight line consists in the number and kind of tensions: the straight line has two distinct primitive tensions which play an unimportant role in the case of the curved line, whose chief tension resides in the arc (third tension, which opposes and out-sounds the others) (Fig. **34**). While the piercing quality of the angle disappears, there is still greater force confined here which, even though it is less aggressive, has greater endurance concealed within it. Something thoughtlessly youthful exists in the angle while in the arc is a mature energy, rightfully self-conscious.

This maturity and the elastic full sound of the curved line lead us to seek the contrast to the straight line—not in the angular—but definitely in the curved line: the origin of the curved line and the character proceeding

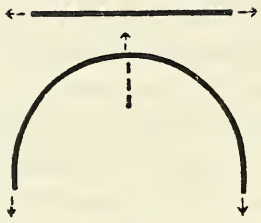

Fig. **34**
Tensions of straight and curved lines.

Contrasts in Lines

out of this origin, i.e., the complete absence of the straight line, compel us to state that:

the straight line and **the curved line** represent **the primary contrasting pair of lines** (Fig. **35**).

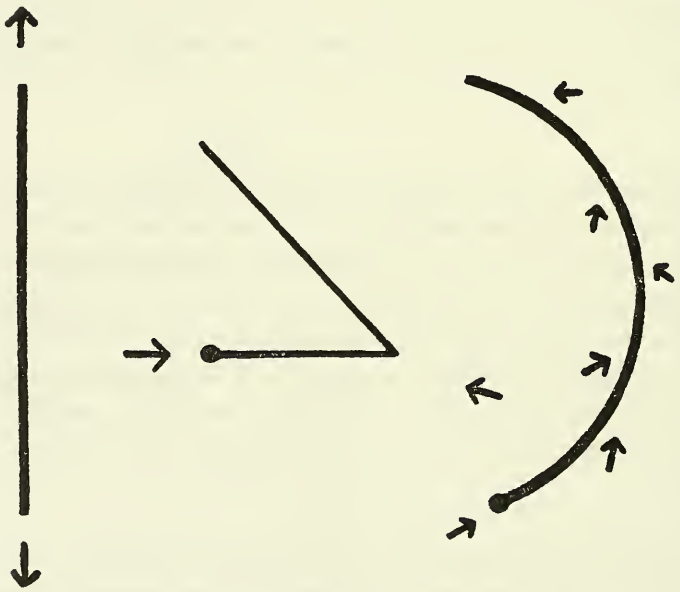

Fig. **35**

The angular line must, therefore, be looked upon as an intermediate element: birth—youth—maturity.

Whereas the straight line is a complete negation of the plane, the curved line carries within it a **seed of the plane.** If the two forces, with the conditions unchanged, roll the point ever farther, the developing curve will sooner or later arrive again at its starting point. Beginning and end flow into each other and in the same instant disappear without a trace. The most unstable and, at the same time, the most stable of planes is created —the circle (Fig. **36**).[1]

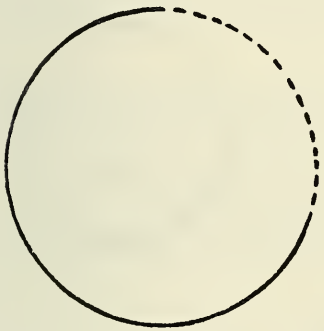

Fig. **36**
Developing circle.

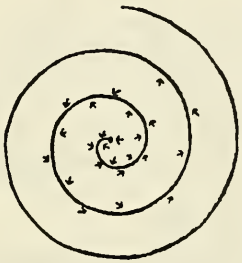

Fig. **37**
Developing spiral.

[1] A form diverging in a regular manner from the circle is the spiral (Fig. **37**); the force acting from within exceeds the outer in a uniform measure. The spiral is, therefore, a circle going off its track in a uniform manner. Besides this difference, another can be observed which, for painting, is much more significant: the spiral is a line, while the circle is a plane. Geometry does not make this distinction which is exceedingly important for painting; aside from the circle, it designates the ellipse, the figure eight and similar plane forms as lines (curves). The term used here, the "curved line," is not the equivalent of the more exact geometric terminology (parabola, hyperbola, etc.) for geometry, from its standpoint on the basis of formulae, must inevitably make classifications which in this connection are out of the question for painting.

Contrast in Relation to the Plane

Even the straight line, in the final analysis, carries within it with its other characteristics the desire (even though deeply hidden) to give birth to a plane; to transform itself into a more compact, more self-contained thing. The straight line is capable of doing this, although, in contrast to the curved line which can create a plane with two forces, it has need of three impulses in plane creation. In the case of this new plane, beginning and end cannot completely disappear, but are observable at three points. Complete absence of the straight and the angular on the one hand and, on the other hand, three straight lines with three angles—these are the signs of the two primary planes which stand in the greatest contrast to each other. Therefore, these two planes confront each other as

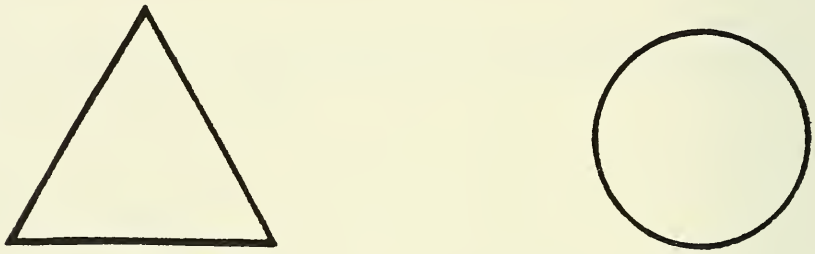

Fig. **38**
the primary contrasting pair of planes.

Three Pairs of Elements

We have now reached the point where it is logical to establish certain relationships between those three parts of the pictorial elements which actually merge with each other, but which are theoretically separable: line—plane—colour.

Straight line,	triangle,	yellow,
Curved line.	circle.	blue.
1. Pair	**2. Pair**	**3. Pair**

Three primary contrasting pairs of elements.

Other Arts

This abstract adherence to law peculiar to one of the arts, finds in this art a constant, more or less conscious application, which can be compared with nature's adherence to law and which in both cases—art and nature —affords the inner human being a very particular satisfaction. Fundamentally, this same abstract, law-abiding quality is most certainly the property of other art expressions. The spatial elements in sculpture and architecture,[1] the tonal elements in music, the elements of movement in the dance, and the word elements[2] in poetry, all have need of a similar uncovering and a similar elementary comparison with respect to their external and their inner characteristics, which I call "sounds."

The tables set up in the sense proposed here must be subjected to an exact examination, and it is easily possible that these individual tables, in the final analysis, will result in **one** synthetic table.

Emotional assertion surely is originally rooted in intuitive experiences and compels our taking the first steps along this inviting road. The emotional alone, however, in this case could easily lead off the track; this can only be avoided with the help of exact analytic work. By the use of the right[3] method, it is possible, however, to avoid pitfalls.

Dictionary

The progress won through systematic work will create an elementary dictionary which, in its further development, will lead to a "grammar" and, finally, to a theory of composition which will pass beyond the boundaries of the individual art expressions and become applicable to "Art" as a whole.[4]

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1 The identity of the basic elements in sculpture and architecture explains in part the victorious subjugation of sculpture by architecture today.

2 The nomenclature used here for the basic elements of the various arts must be looked upon as provisional. Even the commonly-held concepts are hazy.

3 This is a clear example of the necessary simultaneous use of intuition and calculation.

4 See clear suggestions of this in "On the Spiritual in Art" and in my article "Über Bühnenkomposition" in "Der Blaue Reiter," Piper Verlag, Munich, 1912.

The dictionary of a living language is immutable as it undergoes changes perpetually: words become submerged, die; words are created, come new into the world; foreign words are brought home from across the borders.

Strangely enough, a grammar in art today still seems ominously dangerous to many.

Planes

The more alternating forces there are acting on the point, the more diverse their directions, and the more different the individual segments of an angular line are in length, the more complex will be the planes created. The variations are inexhaustible (Fig. **39**).

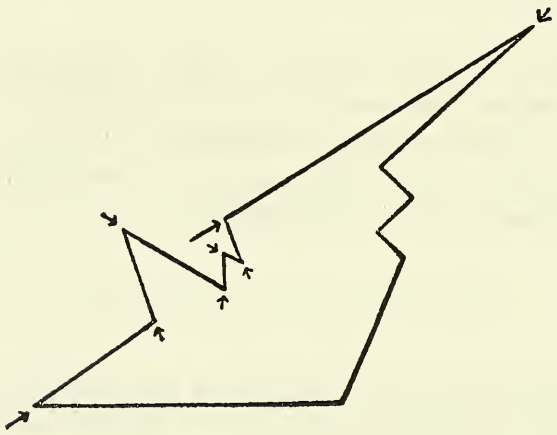

Fig. **39**

This is mentioned here to aid in the clarification of the differences between the angular line and the curve.

The likewise inexhaustible variations in the planes which owe their origin to the curve, never lose a certain—even though distant—relationship with the circle, since they carry circle tensions within them (Fig. **40**).

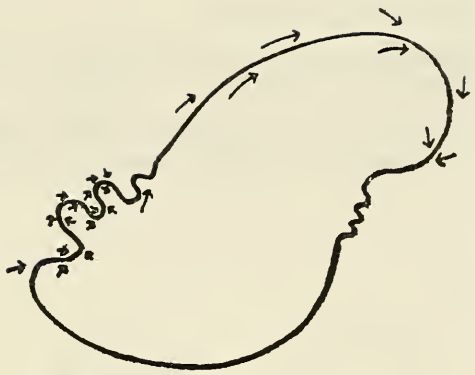

Fig. **40**

Some of the possible variations of the curved line must still be mentioned.

II 2. A complex curved or **wave-like** line can consist of: **Wave-like Line**

1. geometric parts of a circle, or
2. free parts, or
3. various combinations of these.

These three types cover all the forms of the curve. Some examples will confirm this rule.

Curve—geometric wave-like:
Equal radius—uniform alternation of positive and negative pressure. Horizontal course with alternating tensions and release (Fig. **41**).

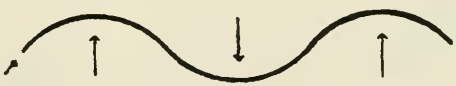

Fig. **41**

Curve—free wave-like:

Displacement of the above lines with the same horizontal extension:

1. the geometric character disappears,
2. positive and negative pressure with irregular alternation, whereby the former gets much the upper hand of the latter (Fig. **42**).

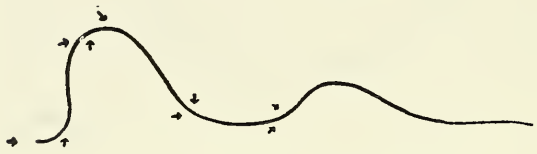

Fig. **42**

Curve—free wave-like:

Displacement increased. Especially temperamental struggle between the two forces. The positive pressure pushes to a very great height (Fig. **43**).

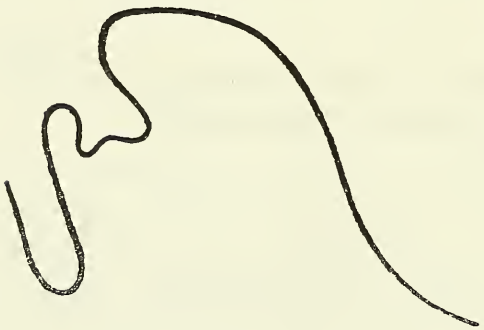

Fig. **43**

Curve—free wave-like:

Variations of these last:

1. the high point directed toward the left—giving way in the face of the energetic attack of the negative pressure,
2. stress on the height through the broadening of the line—accentuation (Fig. **44**).

Fig. **44**

Curve—free wave-like:

After the initial ascent toward the left, immediate, definite tension on a large scale upwards and to the right. Relaxing to circular form toward the left. Four waves are subordinated to one direction, from lower left to upper right[1] (Fig. **45**).

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1 Further discussion of the sound "right," "left," and its tensions will be found in the section "Basic Plane."
The effects of right and left can be investigated by holding the book in front of the mirror; above and below, by turning the book upside-down.
The "reflection" and the "upside-down" are still rather mysterious facts which are of great importance to the theory of composition.

Fig. **45**

Curve—geometric wave-like:
Contrasted to the geometric wave-like line above (Fig. **41**)—pure ascent with modest diversions to the right and left. The sudden weakening of the wave leads to increased vertical tension. Radius from bottom to top—4, 4, 4, 2, 1 (Fig. **46**).

Fig. **46**

In the examples given, two different kinds of conditions produce the result:

Effects

1. the combination of the active and passive pressures,
2. the contribution of the sound of direction.

Associated with these two sound factors can further be

3. the emphasis in the line itself.

Emphasis

This linear accentuation is a gradual, or a spontaneous, increase or decrease in strength. A simple example will make detailed explanations superfluous:

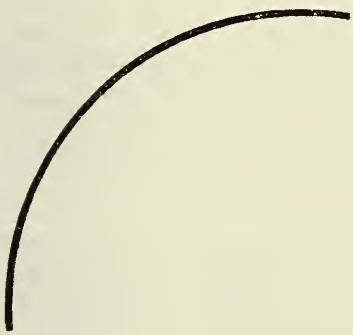

Fig. **47**
Geometric curve in ascent.

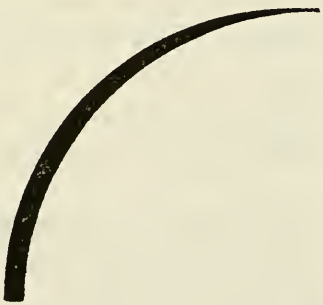

Fig. **48**
The same, with uniformly decreasing emphasis whereby heightened tension of ascent is attained.

Fig. **49**
Spontaneous accentuations of a free curved line.

Line and Plane

The spreading out, especially in the case of a short, straight line, bears a relation to the growing point. Here, too, the question "When does the line as such die out, and at what moment is a plane born?", remains without a definite answer. How shall the question "Where does the river stop and the sea begin?", be answered?

The boundaries are indefinite and mobile, Everything here depends upon proportions, as was the case with the point—the absolute is reduced by the relative to an indistinct, subdued sound. In practice, this "approaching-of-the-boundary" is much more precisely expressed than in pure theory.[1] The "approaching-of-the-boundary" is a potent source of expression, a powerful means (in the final analysis, an element) to ends in composition.

This means, in cases of an acute dryness of the main elements in a composition, produces among these elements a certain vibration and causes

1 Several full page diagrams in this book are clear examples of this. (See Appendix.)

a definite loosening-up of the stiff atmosphere of the whole and can, when used to an exaggerated extent, lead to almost repulsive over-niceties. At all events, one is here still completely dependent upon feeling.

A generally accepted distinction between line and plane is, for the present, impossible—a fact which is perhaps bound up with the still little advanced state of painting, as yet of an embryonic nature, if not possibly determined by the very character of this art.[1]

Outer Boundaries

A particular sound factor of the line is
4. the outer edges of the line,
which are formed partly by the just mentioned accentuation. In these cases, both edges of the line are to be considered as independent outer lines, a fact which has more theoretic than practical value.

In the question of the outer shape of the line, we are reminded of the same question in the case of the point.

Smooth, jagged, torn, rounded are attributes which in the imagination create certain sensations of touch, due to which the outer borders of a line, from a purely practical point of view, should not be underestimated. With the line, the combination possibilities in the transference to touch sensations are far more many-sided than with the point: for example, smooth edges of a jagged line; jagged edges of a smooth, rounded line; torn edges of a jagged line; torn edges of a rounded line; etc. All of these characteristics can be used in the three types of lines—straight, angular and curved—and each of the two sides can have a special treatment.

1 The means to this "approaching-of-the-boundary" extends far beyond the limits of the problem of line-plane and into all the elements of painting and their application; e.g., colour uses this means to a still greater extent, thereby possessing countless possibilities. The basic plane, too, works with this medium which, together with the other means of expression, belongs among the rules and laws of the theory of composition.

Combined Line

III. The third, and last, basic type of line is the result of the combination of the first two kinds. Consequently, it must be called the **combined line.** The nature of its individual segments determines its particular character:

1. it is a **geometric combined line,** if the parts brought together are exclusively geometric,
2. it is a **mixed combined line,** if free parts are associated with geometric, and
3. it is a **free combined line,** if it is composed entirely of free lines.

Force

Quite apart from differences in character which are determined by the inner tensions, and quite apart from their processes of creation, the original source of every line remains the same—the **force.**

Composition

The action of the force on the given material brings life into the material, which expresses itself in tensions. The tensions, for their part, permit the inner nature of the element to be expressed. An element is the objective result of the action of the force on the material. The line is the clearest and simplest case of this creative process which always takes place in exact obedience to law and, therefore, allows and requires an exact law-abiding application. Thus, a **composition** is nothing other than an **exact law-abiding organization** of the vital **forces** which, in the form of tensions, are shut up within the elements.

Number

In the final analysis, every force finds expression in number; this is called **numerical expression.** In art at present, this remains a rather theoretic contention but, nevertheless, it must not be left out of consideration. We today lack the possibilities of measurement which some day, sooner or later, will be found beyond the Utopian. From this moment on, it will be possible to give every composition its numerical expression, even though this may at first perhaps hold true only of its "basic plan" and its larger

complexes. The balance is chiefly a matter of patience which will accomplish the breaking down of the larger complexes into ever smaller, more subordinate groups. Only after the conquest of numerical expression will an exact theory of composition (at the beginning of which we now stand) be completely realized. Simpler relationships associated with their numerical expression were employed in architecture perhaps as early as thousands of years ago (e.g., in the Temple of Solomon), in music, and to some extent in poetry; while more complex relationships did not find numerical expression. It is very tempting to work with simple numerical proportions which, legitimately, are particularly suited to present day tendencies in art. Nevertheless, after this step has been passed, added complexity in numerical relationships will appear just as tempting (or, perhaps, even more tempting) and will be used.[1]

The interest in numerical expression runs in two directions—the theoretical and the practical. In the first, obedience to law plays the greater role; in the second, utility. Law is subordinated here to purpose whereby the work of art attains the highest quality—genuineness.

Complexes of Lines

Until now, individual lines were classified and tested for their characteristics. The different ways of using several lines and the nature of their reciprocal effect, the subordination of individual lines to a group of lines or to a **complex of lines** is a question of composition and passes beyond the limits of my present purpose. In spite of this, a few more characteristic examples are necessary, to the extent that the nature of the individual line can be illuminated by these examples. Some combinations will be very briefly shown here solely as a suggestion of the way to more complex structures.

[1] See "On the Spiritual in Art," p. 90.

Some simple examples of rhythm:

Fig. **50.** Repetition of a straight line with alternation of weights.

Fig. **51.** Repetition of an angular line.

Fig. **52.** Opposed repetition of an angular line, plane formation.

Fig. **53.** Repetition of a curved line.

Fig. **54.** Opposed repetition of a curved line, repeated plane formation.

Fig. **55.** Central-ryhthmic repetition of a straight line.

Fig. **56.** Central-rhythmic repetition of a curved line.

Fig. **57.** Repetition of an accented curved line by means of an accompanying line.

Fig. **58.** Contrasting repetition of a curved line.

Fig. **50**

Fig. **51**

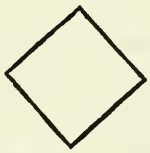

Fig. **52**

Fig. **53**

Fig. **54**

Fig. **55**

Fig. **56**

Fig. **57**

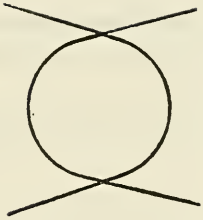

Fig. **58**

Repetition

The simplest case is the exact **repetition** of a straight line at equal intervals—the primitive ryhthm (Fig. **59**),
or in uniformly increasing intervals (Fig. **60**),
or in unequal intervals (Fig. **61**).

Fig. **59**

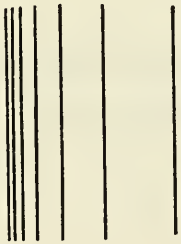

Fig. **60**

Fig. **61**

The first kind presents a repetition which has, primarily, **quantitative reinforcement** as its purpose as, for example, in music where the sound of one violin is reinforced by many violins.

In the second kind, an accompaniment of the **qualitative** enters along with the quantitative reinforcement which, in music, appears about like a

repetition of the same measures after a somewhat long interruption or, in the case of repetitions in "piano," the movement is qualitatively modified.[1]

The third kind, in which a more complex rhythm is used, is the most intricate.

Considerably more complicated combinations are possible in the case of angular lines and, especially, in that of curved lines.

Fig. **62**
Contrasting combination of a curved line with an angular line. The characteristics of both acquire a strengthened sound.

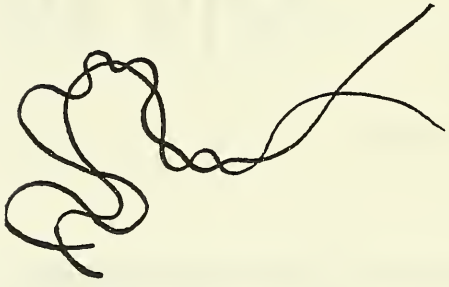

Fig. **63**
Curved lines running along with each other.

[1] Repetition by other instruments of the same pitch must be viewed as a coloured-qualitative one.

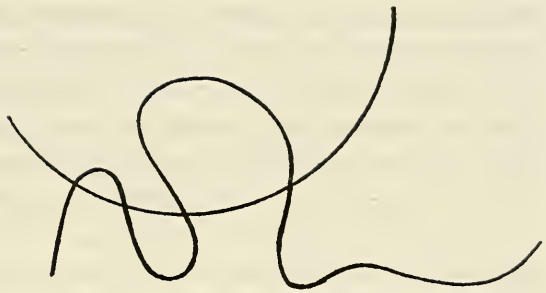

Fig. **64**
Running apart.

Quantitative and qualitative intensifications are present in both instances (Figs. **63** and **64**); nevertheless, they carry within them something soft and velvet-like and due to this, the lyric oversounds the dramatic. In the case of an opposite arrangement of lines, the contrast cannot attain its full sound.

Such really independent complexes can, of course, be subordinated to still greater ones, and these greater ones, in turn, form only a part of the total composition—in about the same way that our solar system forms only a part of the cosmic whole.

The universal harmony of a **composition** can, therefore, consist of a number of complexes rising to the highest point of contrast. These contrasts can even be of an inharmonious character, and still their proper use will not have a negative effect on the total harmony but, rather, a positive one, and will raise the work of art to a thing of the greatest harmony.

Time

The element of time, in general, is discernable in the line to a much greater extent than it was in the case of the point: length is a concept of time. On the other hand, the time required to follow a straight line is different from that required for a curved one, even though the lengths are the same; the more animated the curved line becomes, the longer is the span of time it represents. Thus, the possibilities of using line as a time element are manifold. The application of time has a different inner colouration in horizontal and vertical lines, even if of equal lengths, and perhaps it is in reality a matter of different lengths which, at any rate, would be psychologically explainable. The time element in a purely linear composition must not, therefore, be overlooked and in the theory of composition it must be subjected to an exact examination.

Other Arts

As with the point, the line can be used in forms of art expression other than painting. Its nature finds a more or less precise translation in the means of other arts.

Music

What a **musical line** is, is well known (see Fig. **11**).[1] Most musical instruments are of a linear character. The pitch of the various instruments corresponds to the width of the line: a very fine line represents the sound produced by the violin, flute, piccolo; a somewhat thicker line represents the tone of the viola, clarinet; and the lines become more broad via the deep-toned instruments, finally culminating in the broadest line representing the deepest tones produced by the bass-viol or the tuba.

Aside from its width, the line is produced in its colour variations by the diversified chromatic character of different instruments.

The organ is quite as typical a "linear" instrument as the piano is a "point" instrument.

[1] The line grows organically out of points.

It can be asserted that in music the line supplies the greatest means of expression. It manifests itself here in time and space just as it does in painting.[1] How time and space are related to each other in the two forms of art is a question by itself which, with its distinctions, has led to an exaggerated scrupulousness and, thereby, the concepts of time-space or space-time have been differentiated far too much.

The degrees of intensity from pianissimo to fortissimo can be expressed in an increasing or decreasing sharpness of the line, that is, in its degree of brilliance. The pressure of the hand on the bow corresponds exactly to the pressure of the hand on the pencil.

It is particularly interesting and significant that the graphic musical representation in common use today—musical notation—is nothing other than various combinations of point and line. The time is recognizable therein only by means of the colour of the point (white and black only, which consequently leads to the restriction of the means) and the number of pennant stripes (lines). The pitch is likewise measured in lines, and five horizontals form the basis of this. The unqualified brevity and the simplicity of the means of translation, which in clear language convey the most complex sound phenomena to the experienced eye (indirectly to the ear) are instructive. Both of these characteristics are very alluring for the other forms of art and it is understandable that painting or the dance should be in search of its own "notes." There is, however, only one way to arrive finally at their own graphic expression—analytic separation into fundamental elements.[2]

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[1] In measuring tonal pitch in physics, special apparatus is used which projects the vibrating tone mechanically on a surface and which thereby gives the musical tone a precise graphic form. Similar things are also done with colour.
In many important cases, the science of art already makes use of exact graphic translations as material for the synthetic method.

[2] The relationships of the pictorial means to the means of other art expressions and, finally, to the phenomena of other "worlds," can be indicated only very superficially here. "Translations," especially, and their possibilities—in general, the transcription of various phenomena into their respective linear ("graphic") and colour ("pictorial") forms—require a thorough study of linear and colour expression. There is no question that, in principle, every phenomenon of every world admits of such expression—the expression of its inner nature—regardless of whether it be Raphael, J. S. Bach, a storm,

The Dance

In the **dance**, the whole body—and in the new dance, every finger—draws lines with very clear expression. The "modern" dancer moves about the stage on exact lines, which he introduces in the composition of his dance as a significant element (Sacharoff). The entire body of the dancer, right down to his finger tips, is at every moment an uninterrupted composition of lines (Palucca). The use of lines is, indeed, a new achievement but, of course, is no invention of the "modern" dance: apart from the classic ballet, every people at every stage of their "evolution" work with line in the dance.

Sculpture Architecture

One is not at a loss for proof of the role and significance of the line in **sculpture** and **architecture**—the structure in space is, at the same time, a linear construction.

An exceedingly important task of art-scientific research would be an analysis of the fate of lines in architecture, at least in the case of the typical works of various peoples in various epochs, and, what is bound up with this, a purely graphic translation of these works. The philosophic basis of this work would be the determination of the relationships of graphic formulae to the spiritual atmosphere of the given time. The final topic, for the present, would be the logically necessary restriction to the horizontal-vertical, with the conquest of the air by the projecting upper parts of a building, for which present day building materials and present day building techniques offer extensive and reliable possibilities. The principle of building just described must, to follow my terminology, be designated as cold-warm or warm-cold, depending upon whether the horizontal or the vertical is emphasized. This principle has in a short time produced a number of important works, and they continue to be created in the most diverse countries (Germany, France, Holland, Russia, America, etc.).

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fear, a cosmic process, tooth-ache, a "high" or a "low" phenomenon, a "high" or a "low" experience. The only danger would be to remain bound to the external form and to neglect the content.

Poetry

The rhythmic form of the **verse** finds its expression in the straight and the curved line, where a regular recurrence is exactly denoted graphically—meter. Besides this rhythmic measurement of length, which is precise, the verse develops on recital a certain musical melodic line which gives expression, in an inconstant and variable form, to the rise and fall, the tension and the release of tension. Fundamentally, this line is law-abiding as it is bound up with the literary content of the verse—the tension and release of tension are analagous to content. The variability resulting from a departure from the law-abiding line depends in the same way, and with greater freedom, upon the person reciting; similarly, in music, the variation in the intensity of the sound (forte and piano) is dependent upon the musician. This imprecision in the musical melodic line is less dangerous in "literary" verse. It is fatal in an abstract poem because the line of pitch values represents an essential, definite element. A notation should be found for this kind of poetry which would show the pitch line as exactly as notation does in music. The question of the possibility and limits of abstract poetry is complicated. It must only be mentioned here that abstract art must reckon with a more precise form than representative art, and that the pure question of form is in the first case essential and in the second, very often immaterial. I have discussed this same difference in relation to the use of the point. As has already been said above, the point is—silence.

Technics

In a neighboring field of art—**engineering art** and the technics closely related to it—the line grows ever more in importance (Figs. **65** and **67**).

So far as I know, the Eiffel Tower in Paris was the most significant early attempt to create an especially high building out of lines; the line has here replaced the plane.[1]

[1] A special and very important case in technics is the use of line as the graphic expression of number. The automatic drawing of lines (like that also used in meteorological observations) is a precise graphic representation of an increasing or decreasing force. This representation makes possible the reduction of the use of number to a

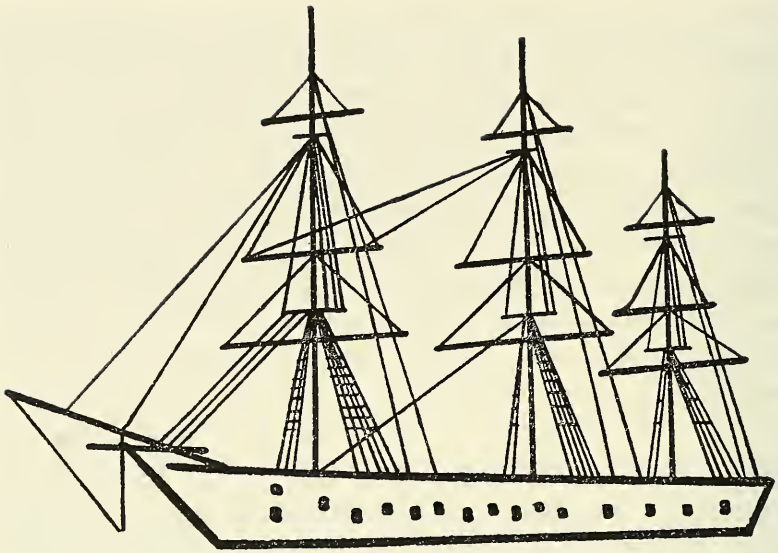
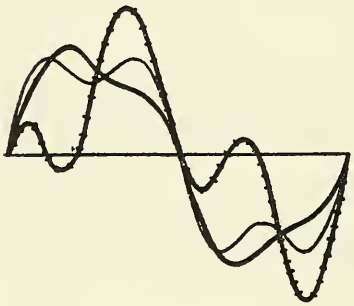


Fig. **65**

Diagram of a sailing vessel. Linear construction for the purpose of movement. (Ship's hull and rigging.)

minimum—the line partially replaces the number. The resulting diagrams are clear and also comprehensible to the layman (Fig. **66**).



The same method, that of giving expression to a development or a temporary condition by the height of lines, has for years been used in statistics where the charts (diagrams) have to be made by hand and are the result of tedious, pedantically executed work. The method is also used in other sciences (e.g. in astronomy, "lightcurve").

Fig. **66**

Rectification of the curve of an electrical current in graphic representation—by Felix Auerbach, Verlag Teubner.

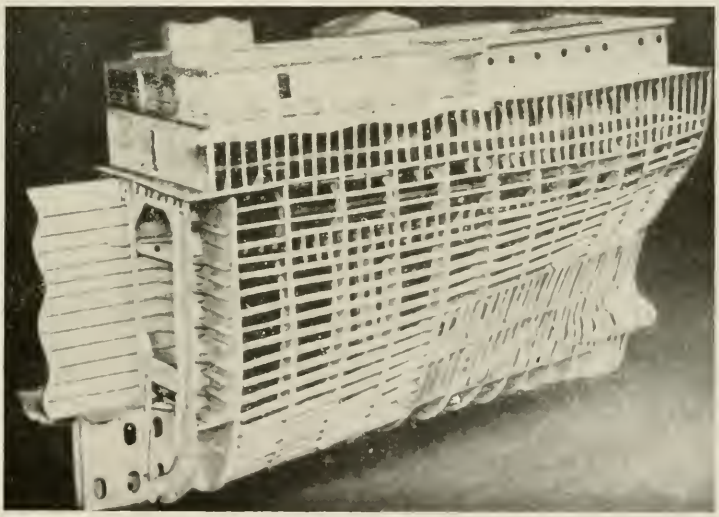


Fig. **67**
Framework of a motor freightship.

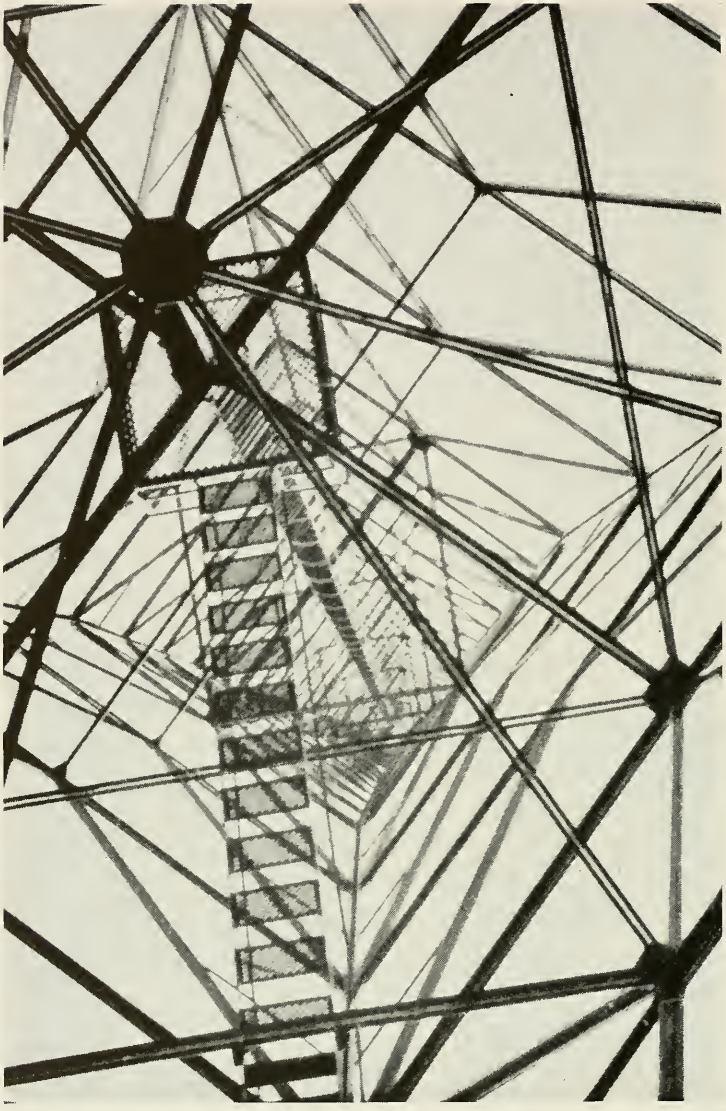


Fig. **68**
Radio tower, seen from below. (Photo Moholy-Nagy.)

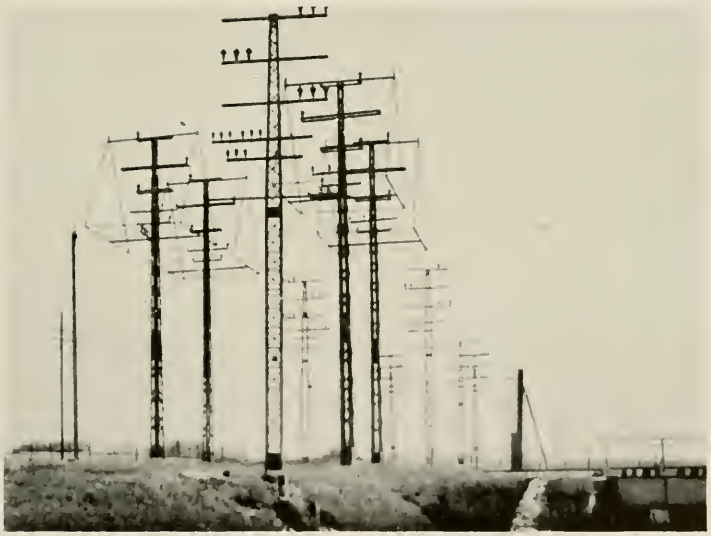


Fig. **69**
Forest of masts.

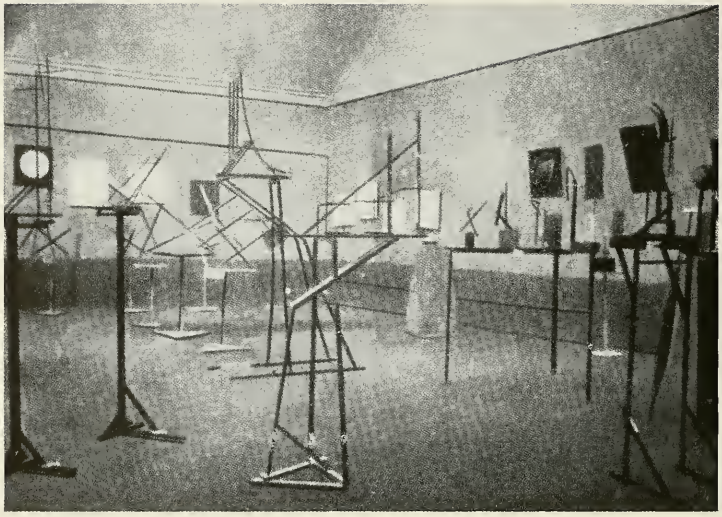


Fig. **70**
A room of the Constructivist Exhibition in Moscow, 1921.

The connections and rivets are points in these linear constructions. These are line-point constructions, not upon the plane, but in space (Fig. **68**).[1]

Construc-tivism

The **"constructivist"** works of recent years are for the most part and especially in their original form, "pure" or abstract constructions in space, without practical-useful application, which distinguishes these works from the art of the engineer and compels us to assign them to the field of absolute art. The vigorous use and strong accentuation of the line by point connections are striking in these works (Fig. **70**).

Nature

The use of line in **nature** is an exceedingly frequent one. This subject, which merits special investigation, could be mastered only by a synthesizing natural scientist. It would be especially important for the artist to see how nature uses the basic elements in her independent realm; which elements are to be considered; what characteristics they possess; and in which manner they combine to form structures. Natural laws of composition do not reveal to the artist the possibility of superficial imitation (which he frequently sees as the main purpose of the laws of nature) but, rather, the possibility of contrasting these laws with those of art. Also in this point, decisive for the abstract in art, we already discover the law of setting side-by-side or setting opposite (the two principles—the principle of the parallel and the principle of contrast) which was shown in the case of line groupings. The laws of the two great realms—art and nature—separated in this way and living independently, will finally lead to the understanding of the whole body of the laws of world composition and clarify the independent activity of each toward a higher synthetic order: external + inner.

This viewpoint has, until now, become evident only in **abstract** art which has recognized its rights and duties, and which no longer leans upon the

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[1] A special technical construction—masts, which are erected for distant transmission of electrical power, affords an instructive example of this (Fig. 69). One gets the impression here of a "technical forest," which looks similar to a "natural forest" of palms or fir trees, pressed flat. In the graphic construction of such a mast, the two basic graphic elements—line and point—are used exclusively.

external shell of natural phenomena. It should not be replied here that this external shell in "objective" art is put to the service of inner purposes —it remains impossible to incorporate completely the inner of one realm into the outer of another.

The line appears in nature in countless phenomena: in the mineral, plant and animal worlds. The schematic construction of the crystal (Fig. **71**) is a purely linear formation (an example in plane form—the ice crystal).

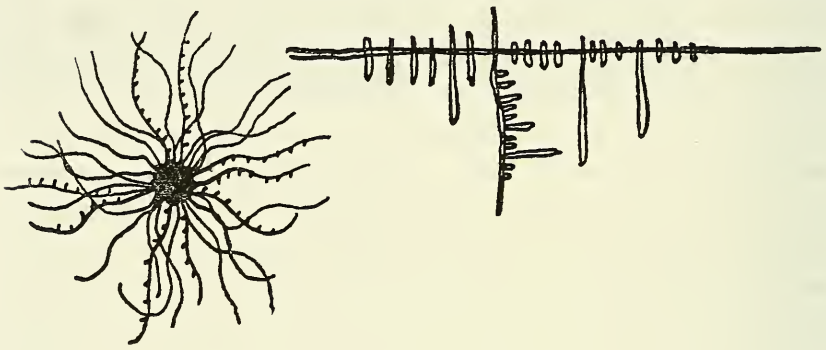

Fig. **71**
"Trichites"—hair-like crystals. "Crystal skeleton."
(Dr. O. Lehmann, "Die neue Welt d. flüssigen Kristalle," Leipzig, 1911, pp. 54, 69.)

A plant in its entire development from seed to root (downwards), as far as the beginning of the bud (upwards),[1] passes over from point to line (Fig.

[1] The attachment of the leaves around the shoot takes place in the most exact manner, which can be expressed with a mathematic formula—numerical expression—and science has represented this with a spiral-like diagram (Fig. **72**). Compare this with the geometric spiral on p. 81, Fig. **37**.

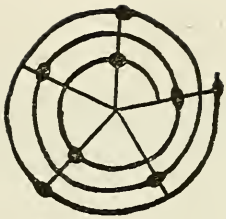

Fig. **72**
Diagram of leaf positions.
(Points of attachment of the leaves to the shoot, which follow each other in sequence.)
"Basic Spirals." (K. d. G., Botan. Teil, Part III, Section IV 2.)

73) and, as it progresses, leads to more complicated complexes of lines, to independent linear structures, like the network of the leaf or the eccentric construction of evergreen trees (Fig. **75**).

Fig. **73**
Swimming movements of plants created by flagellation.
(K. d. G., Part III, Section IV 3, p. 165.)

The organic linear pattern of the branches always emanates from the same basic principle but exhibits the most varied arrangements (e.g., among

trees alone: fir, fig, date palm, or the most bewildering complexes of the liana and various other snake-like plants). Some complexes are, moreover, of a clear, exact, geometric nature and vividly recall geometric constructions made by animals, as, for example, the surprising formation of the spider's web. On the other hand, some are of a "free" nature and made up of free lines; the loose structure reveals no exact geometric construction. Nevertheless, the fixed and exact are not excluded here but are only employed in a different manner (Fig. **74**). Both types of construction are found in abstract painting.[1]

Geometric and Loose Structure

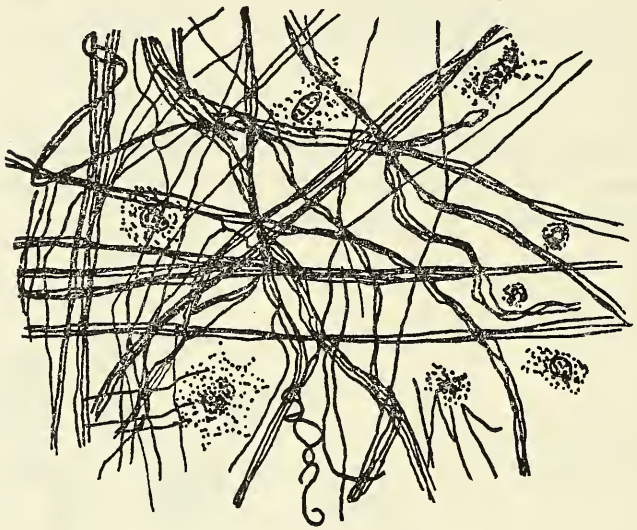

Fig. **74**
"Loose" ligament tissue of the rat.
(K. d. G., Part III, Section IV, p. 75.)

[1] There are two reasons for the fact that in recent years exact geometric construction in painting has seemed so very important to painters: 1, the necessary and natural use of abstract colour in the "suddenly" awakened architecture, where the colour plays a role subordinated to the whole and for which "pure" painting prepared itself unconsciously in "horizontal-vertical" and 2, the necessity which sprang up naturally, dragging

Fig. **75**
Blossom of the Clematis. (Photo Katt Both, Bauhaus.)

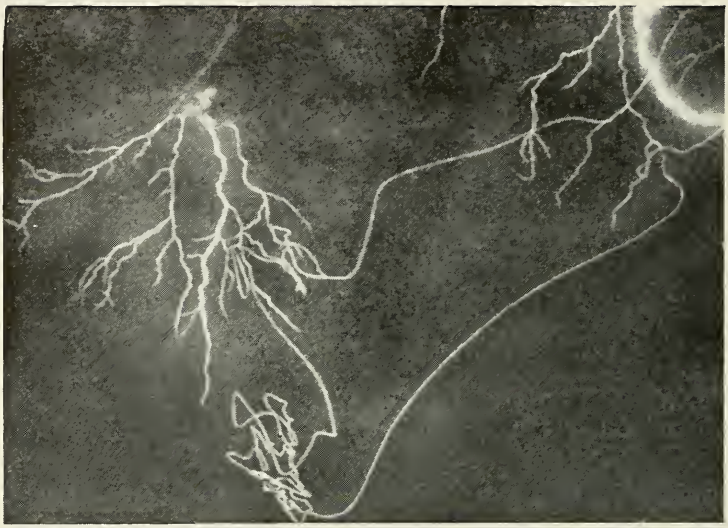

Fig. **76**
Line formation of a stroke of lightning.

This relationship, one may well say "identity," is a momentous example of the connection between art laws and natural laws. One must not, however, draw false conclusions from similar cases: the difference between art and nature lies not in the basic laws but, rather, in the material which is subject to these laws. Furthermore, the basic characteristics of the material, which in each case are different, must not be left out of consideration: the proto-element of nature—cell—which is well known today, is in constant, actual movement, whereas the proto-element of painting—point—knows no movement and is rest.

Thematic Structure

The skeletons of various animals exhibit the most diverse linear constructions in their evolution to the highest form known today—Man. These variations leave nothing to be desired in "beauty" and astonish us time and again by their multiplicity. What surprises us most in this is the fact that these leaps—from the giraffe to the toad, from the human being to the fish, from the elephant to the mouse—are nothing more than variations on **one** theme, and that the most infinite possibilities are drawn entirely out of the **one** principle of concentric structure. The creative power must adhere in this to definite natural laws, which exclude the eccentric. Natural laws of this kind are not intended for art and the road of the eccentric remains completely free and open.

Art and Nature

The finger grows out of the hand exactly as a twig has to grow out of the branch—according to the principle of gradual development out of the

painting along with it, to reach back to the elementary, and to seek this elementary not alone in itself, but in its structure as well. This tendency can be observed in the whole attitude of the "new" individual, not only in art but more or less in all fields, as a transition from the primary to the complex, which will sooner or later definitely be accomplished. Abstract art, which has gained its freedom, is also subject here to the "laws of nature" and is forced to proceed as nature did formerly; from a modest beginning with protoplasm and cells, it very gradually advanced to more complex organisms. Abstract art today is also creating primary, or more or less primary, art organisms, whose further development the present day painter can only surmise in its indefinite outlines; these lure him, excite him, but also quiet him when he looks into the perspective of the future which lies before him. It may, for example, be remarked here that those who question the future of abstract art, reckon with the evolutionary state of the amphibians, which are very considerably removed from developed vertebrates, and do not represent the end result of creation but, rather, the "beginning."

center (Fig. **77**). In painting, a line can exist without subordinating itself externally to the whole, without having an **external relationship** to the center—the subordination here is of an **inner nature.** Even this simple fact must not be underrated in the analysis of the relationships between art and nature.[1]

Fig. **77**
Diagram of one of the extremities of a vertebrate.
Termination of the central structure.

[1] These exceedingly important questions can only be briefly touched upon within the limited confines of this book: they are part of the theory of composition. It must only be emphasized here that the elements are the same in different creative fields and that the differences first reveal themselves in the structure. Furthermore, the examples used here should be looked upon only in this light.

The fundamental difference lies in the purpose or, more exactly stated, in the means to the end and, in the final analysis, the end in art and in nature must—for human purposes—be the same. At any rate, it is advisable in either case not to confuse the shell with the nut.

As for the means, art and nature, in relation to the human being, move in different directions which are far removed from each other, even though they tend toward **one** point. This difference should become fully clear.

Each kind of line seeks the appropriate external means to enable it to attain the shape necessary at the moment and, specifically, on the general basis of economy: the minimum effort for the maximum result.

The Graphics

The material characteristics of the **"graphics"** discussed in the section about the point can apply equally as well to the line, which is the first natural sequel to the point: most easily produced in etching (especially with acid) by deeply embedding the line; careful and difficult work in the woodcut; light lying-on-the-surface in lithography.

It is interesting at this point to make some observations about these three techniques and about their relative popularity.

The order is:
1. woodcut—plane, as easiest result,
2. etching—point and line,
3. lithography—point, line, plane.

The artistic interest in the elements and their respective techniques is about in this order.

The Woodcut

1. After a long extended period of interest in brush painting and following the underestimation—in many cases, contempt—for the graphic means which was bound up with this, esteem for the forgotten (especially the German) **woodcut** suddenly awakened. In the beginning, the woodcut was practised on the side as a lower form of art until it spread farther and more victoriously and, finally, became the characteristic type of work of the German graphic artist. In addition to other factors, this circumstance is closely bound up with the plane, to which much attention was paid at that time—plane period of art or the art of the plane. The plane, the chief means of expression of painting at that time, soon thereafter conquered sculpture which became plane sculpture. Today it is clear that this stage of development, reached about 30 years ago in painting and almost simultaneously in sculpture, was directed unconsciously toward architecture. Hence the already mentioned "sudden" awakening of architecture.[1]

Line in Painting

It was a matter of course that painting should concern itself again with its other chief medium—the line. This took place (and continues to take place) in the shape of a normal development of the means of expression, an evolution proceeding quietly, which was first looked upon as a revolution and is still viewed as such by many theorists, especially in the case of the use of the **abstract** line in painting. To the extent that abstract art is recognized at all by these theorists, the use of the line in graphics is judged favorably but, in painting, they consider its use to be contrary to its nature and, therefore, forbidden. This is a characteristic example of the existing confusion in concepts: that which can easily be segregated and placed in separate categories is mixed together (art, nature), and, on the other hand, the things that belong together (painting and the graphics) are carefully separated from each other. The line is considered here to be a "graphic" element and not to be used for "pictorial" purposes, although an elementary difference between "the graphics" and "painting" cannot be found and could never be established by the theorists mentioned.

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[1] An example of the fruitful influence of painting on the other forms of art expression. An elaboration of this subject would surely lead to surprising discoveries in the history of the development of all the art forms.

2. **Etching**, of all existing techniques, is able to create most precisely the line lying firmly in the material and, more especially, the very thin line. It was, therefore, brought out of the old storage chest and the search which began for elementary forms was bound to lead to the thinnest line, which, viewed in the abstract, is an "absolute" sound among lines. **Etching**

This same preoccupation with the primary resulted in one other consequence—the most exclusive use of one half of the total form along with the elimination of the other half.[1] In etching particularly, in view of the difficulties encountered in the use of colour, the restriction to the pure, graphic form is especially natural, and for this reason etching is a specifically black and white technique.

3. **Lithography**—as the last invention in the series of graphic processes—affords the highest degree of flexibility and elasticity in its workmanship. **Lithography**

Its particular speed in creation, combined with an almost indestructible hardness of the block, completely suits the "spirit of our time." Point, line, plane, black and white, coloured works—everything is accomplished with the greatest economy. Flexibility in the handling of the lithographic stone: that is, ease of application with any tool, and the almost limitless possibilities of correction—especially the removal of faulty spots which neither the woodcut nor the etching readily permits—and the resulting facility in the execution of works without an exact previously formed plan (e.g., in experiments), fulfill both the external and the inner current need to the highest degree.

Finally, consistently following the road to the primary elements, the particular characteristics of the point also had to be found and illuminated

1 E.g., the exclusion of colour or, at least, its reduction to the minimum sound in any number of cubist works.

as a part of the purpose of this book. Here, as well, lithography offers its rich means for use.[1]

Point—rest. Line—inwardly animated tension created by movement. The two elements—their intermingling and their combinations develop their own "language" which cannot be attained with words. The exclusion of "trimmings," which hush and obscure the inner sound of this message, lends the greatest brevity and precision to pictorial expressions. The pure form places itself at the disposal of the living content.

[1] It remains to be mentioned that the three techniques have a social value and are related to social forms. The etching is certainly of an aristocratic nature: a plate can produce only a few good prints and they, furthermore, turn out differently each time so that every print is unique. The woodcut is more abundant and uniform, but it can be used for colour only with difficulty. The lithograph, on the other hand, is able to yield an almost limitless number of prints with the greatest rapidity in a purely mechanical way and, through the ever more developing use of colour, approaches the hand-painted picture. At any rate, it produces a certain substitute for the picture. The democratic nature of lithography is hereby clearly indicated.