THE USES OF GRAPHICS IN PLANNING

by

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B.A., Reed College, 1971

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

in

THE SCHOOL OF COMMUNITY AND REGIONAL PLANNING

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

May, 1977

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Date _May 3, 1977._

ABSTRACT

Practicing planners spend a substantial portion of their time and budgets preparing and using planning graphics. Yet very little literature exists within the planning field which attempts to investigate the uses of graphics for the profession. Hence, the thesis sets out an introductory framework for applying both current planning practices and knowledge about graphics from other fields to the role of graphics in the planning process.

Current planning practices were investigated in a series of interviews with representatives of two groups in the Vancouver area: planners and graphic artists who prepare the bulk of their work for planning purposes. The information obtained in these interviews is presented in detailed form in Chapter 1 and is summarized and analyzed in Chapter 2.

The literature on graphics was reviewed for those aspects which seem suggestive for planning applications. In Chapter 3, general theories which discuss the role of graphics in cognitive processes and in the communication of ideas are presented. Theories relating to the functions of various elements in graphics are the subject matter of Chapter 4. Specifically, principles of perceptual psychology, colour theory, typography, the use of symbols, and the choice of appropriate graphic media are investigated.

Finally, a number of conclusions are drawn regarding both the current graphic practices within the planning profession and the theoretically optimal use of graphics. The

conclusions are, therefore, related both to the topics discussed in the interviews and to the review of relevant literature. Furthermore, these conclusions suggest a variety of improvements in both planning practice and education.

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INTRODUCTION

Professional planners rely on graphic techniques at various stages in the planning process. Graphic devices are used by individual planners as research and thinking tools, by groups of professionals as discussion aids, and by planning organizations to communicate ideas to clients and the public. Estimates by planning professionals range as high as 25% for the time and budget devoted to graphic work. It is, therefore, surprising that there is virtually no literature within the planning field which attempts to evaluate planning graphics on a theoretical basis. Hence, this paper attempts to formulate an introductory framework for applying knowledge about graphic techniques from other fields to current planning practices to render these processes more effective.

Interviews were conducted with fifteen representatives of two groups in the Vancouver area: practicing planners and graphic artists who prepare the bulk of their work for planning purposes. The specific people chosen to be interviewed represent a variety of planning organizations. They are generally people with a greater than average interest in the use of graphics in planning. The information obtained from these interviews represents a background of current local planning practice into which theoretical graphic concepts can be integrated.

The thesis which is proposed is that theoretically graphics can communicate on many levels at the same time and that current planning graphics often fail to take full

advantage of this potential. Furthermore, graphic theory
suggests specific steps which can be taken to bring planning
graphics closer to their optimum effectiveness.

In Chapter 1, the responses of the people interviewed
to a number of question topics are recorded. They describe the
graphic techniques they use and the purposes for which they
apply them. The objectives set for graphics are discussed,
as well as the techniques used to communicate these objectives
to those involved in producing planning graphics. Questions
were asked about the structure of the planning organization as
it reflects the methods for graphic production. Estimates were
requested of the percentages of staff time and money budgeted
for graphic purposes. Any studies which evaluated the
effectiveness of specific graphics or of the graphic production
process were sought. Both the planners and the graphic artists
described the formal and informal studies which they felt
aided them or their co-workers in the effective use of graphics
for planning purposes. All these questions shed light on the
practice of graphics and on the attitudes of professionals
towards graphic techniques. In Chapter 2, the detailed inter-
view material is analyzed and synthesized into a compact form
which is more suggestive of conclusions.

In Chapter 3, the theoretical literature which deals
generally with the role of graphics in communication is
presented. A case is made for the ability of graphics to ex-
press complex information clearly and concisely. Graphics are
considered with reference to theories which treat visual

images as essential to certain cognitive processes. In this sense, graphics are a type of visual language which is the appropriate mode to analyze and express some important planning concepts. In Chapter 4, specific graphic techniques are extracted from the literature. These techniques may be viewed as the grammar of the visual language of graphics. Mastery of this grammar is the key to the optimal use of graphics in planning. Finally, in the Conclusions the current planning practices and attitudes with regard to planning graphics are compared and contrasted with the theoretical literature suggesting specific opportunities for improving the effectiveness of graphics for the profession.

For the purpose of taking a broad and comprehensive look at planning practices, the terms "graphic" and "graphics" are intended to encompass a wide variety of media and techniques. According to Webster's Dictionary, "graphic" as a noun means "a picture, map, or graph used for illustration or demonstration".[1] "Graphics" is "the art or science of drawing a representation of an object upon two dimensional surface according to mathematical rules of projection".[2] Limiting the meaning of "graphics" to two-dimensions seems too restricting. John Cataldo suggests a wider grouping in his book Graphic Design:

> "In considering the types of communication which are essentially visual and which appeal to a popular audience, we must include newspapers, magazines, political cartoons, the comics, posters, handbills, mailing pieces, periodicals, trade journals, television, photography, and motion pictures."[3]

The planners interviewed mentioned most of the above uses as "graphics" as well as such three-dimensional techniques as topographic and architectural models. Therefore, the term "graphics" is used here to refer to any expression of an idea which relies primarily on conveying a visual image as opposed to a verbal message.

In his book <u>Urban and Regional Planning</u> Peter Hall explains that:

> "Planning....is an extremely ambiguous and difficult word to define. Planners of all kinds think that they know what it means; it refers to the work they do. The difficulty is that they do all sorts of different things, and so they mean different things by the work; planning seems to be all things to all men." 4

The definition which he formulates to confront this ambiguity serves equally well for the purposes of this paper:

> "Planning as a general activity is the making of an orderly sequence of action that will lead to the achievement of a stated goal or goals. Its main techniques will be written statements, supplemented as appropriate by statistical projections, mathematical representations, qualified evaluations and diagrams illustrating relationships between different parts of the plan. It may, but need not necessarily, include exact physical blueprints of objects." 5

It is important to acknowledge that graphics are a tool in planning, a means to given ends. Because the objectives of planning projects can be stated, the opportunity exists to evaluate graphics with respect to their effectiveness in helping to achieve planning goals.

INTRODUCTION – FOOTNOTES

1 Webster's Seventh New Collegiate Dictionary. G. and C.
   Merriam Co. Springfield, Mass., 1965. p. 364.

2 Ibid. p. 364.

3 John Cataldo. Graphic Design & Visual Communication.
   International Textbook Co. Scranton, Pa., 1966. p. 7.

4 Peter Hall. Urban & Regional Planning. Penguin Books.
   Middlesex, 1975. p. 3.

4 Ibid. p. 6.

CHAPTER 1:   INTERVIEW MATERIAL

Interviews were conducted with people in the Vancouver
area who are either professional planners or graphic artists
preparing the majority of their work for planning purposes.
In several cases, this distinction breaks down where individual
planners take responsibility for the production of their own
graphic material.   Many of the graphic artists regularly pro-
duce work for the planners interviewed, thereby providing
opportunities to compare the planning and graphic inputs to
specific projects.

The planners were asked to describe the purposes for
which they use graphics in their work.   These uses fall into
two general categories: for purposes within the planning
organization and for communication with people external to
the organization.   The planning organization in this sense
represents the usual working team for the individual planner
whether it be a municipal planning department or an aggregation
of consultants assembled to complete one project.   The people
outside the organization are those to whom the planning
conclusions must be communicated: political bodies, private
clients, and the public.

The planners explained the objectives they set for
graphics and how these intentions are communicated to the
graphic artists.   The decision to use a certain medium is an
important aspect of this process.   Another concern was the
stage of the planning process at which the graphic artist
would be asked to become involved.   In those cases where the

graphic artists are part of the same department or organ-
ization as the planners, their positions within the
organizational structure are of interest.

Information on how much time and money is devoted to
graphics in percentage terms was obtained when it was avail-
able. Any evaluations of the effectiveness of the graphics
produced, especially with regard to time and budget
expenditures, were also requested. However, such evaluative
material was virtually nonexistent.

The graphic specialists described how objectives for
planning projects are communicated to them by the planners with
whom they work. They also discussed the appropriate
application of graphic techniques to achieve these objectives.
The stage at which they are brought into the planning process
is an aspect of this issue as is the initiative which they
are given by the planners once they have been consulted.

The planners and the graphic artists were asked
about their formal and informal training both in graphic
technique and theory and in the planning field. They
commented on those studies which are of continuing value to
them. Some mentioned subjects which they believe could be
useful to them if they were to have an opportunity to pursue
them. Examples of graphics from recent planning projects
were obtained, particularly if they had been referred to in
the interviews.

Graphics are used for a wide range of purposes within the planning field. In general, the graphics which are used within a planning organization tend to be informal, fairly loosely structured, and temporary. Hence, a professional graphic artist is not usually involved. They often serve as working tools for a group or as thinking aids for individuals

For the Director of the Overall Division of the Planning Department, City of Vancouver, the main purpose of graphics is to further communication to three audiences: members of the Planning Department, Vancouver City Council, and the public. Graphics within the Department are informal but fairly infrequent. Len Tennant, a planner in the same Division, listed a number of graphic methods used by his co-workers. They often "model their ideas on paper". Recently, they have been exploring the Strategic Choice Method developed at the Tavistock Institute in England and taught to them by Allen Hickling. He feels that a major value of Hickling's approach involves the terminology which has been developed for various concepts such as "introconnectiveness". The use of these terms by the group improves communication and saves time. Division members often use tables and lists to break their work load into specific tasks. From time to time, a division member will do a "mini-presentation" for the others to get across a newly developed concept. Len Tennant personally finds it most effective to start such a presentation in a simple graphic form on a large sheet of paper and write

in the details during the group discussion, thereby giving the group members a sense of building the concept together.

Larry Beasley, an Area Planner working in the Neighbourhood Improvement Program office for the Riley Park neighbourhood in Vancouver has considerable graphic experience and, consequently, finds many uses for graphic methods as part of his ongoing work. He uses a number of graphic devices to communicate with his N.I.P. Committee. He records decisions and ideas during committee meetings on big sheets of paper which are later hung on the walls of the office to be available for study and reflection by committee members. Work schedules are posted in chart form for the same purpose. Standard City base maps are also on display showing zoning districts, land use, land ownership, and owner-occupied and tenant-occupied premises. He has found, however, that committee members, although many have been long time residents of the area, cannot associate specific buildings with the aerial views shown on these maps. As a consequence, he plans to prepare a commercial study using sketches and photographic mosaics of the street faces as well as maps.

He has evolved a graphic method similar to that used by Christopher Alexander in his "Pattern Language". He uses a picture to express an idea for a solution to an aspect of a problem confronting the committee. The pictoral form separates the idea from "the planning jargon" he might use if he described it in words. This picture permits either a discussion of the pros and cons of the concept alone or of a group of various

alternatives since the patterns can be moved around to expose relationships among them.

Jim Moodie, the co-ordinator of the Champlain Heights Development process, is a professional planner and an experienced graphic artist. He also feels that pattern language is an important graphic method for the planning field as are design guidelines. He uses both pattern language and design guidelines to a limited extent within his organization, although the major responsibility for the preparation of the design guidelines to be used by potential developers rests with the architectural firm which was hired to consult to the City for this purpose.

Ted Rashleigh, a planner who was until recently a Senior Associate in the Planning Department of the Greater Vancouver Regional District, described a number of ways that graphic methods serve as working tools within that Department. The planners often use base maps to rough out their ideas. Diagrams on sheets of paper or blackboards are used to express relationships between ideas. Flow charts are often used. Critical path programs from the computer are also available but less common. Overlay map systems are used to a limited extent, primarily as overhead slides which can be piled on top of each other. Allen Hickling was hired to teach the G.V.R.D. Planners the Strategic Choice Method. It is used by them as an organized, simplified way to think about complex relationships. In general, he found that the planners tended to share their ideas in meetings as dry runs of presentations which were

eventually intended for external people. If they used graphic techniques in the course of their individual research, it was almost always a personal, private approach. Attempts to get the planners to submit to a standardized graphic method were unseccessful.

Dougald McDonald, a planning consultant specializing in environmental land use and aesthetics, uses a specific graphic technique as a major working method. He sketches pictures in perspective of existing conditions and of his proposed alternatives for altering those conditions. He can evaluate his concepts as to their workability and their effectiveness. These sketches are then incorporated into the final presentation of his ideas to the clients. He feels that his drawings explain his concepts more effectively than words. In fact, he finds that he usually ends up "with his pencil in hand" when discussing proposals with clients. He will often sketch ideas suggested by the client. In some instances the client will realize that a request is inappropriate as he is able to visualize its effect through the sketches.

Andreas Naumann, another consultant specializing in land use planning for environmental projects, works primarily with maps. He feels it would be "virtually impossible" to do environmental planning without depicting information on maps. Most of his work is done as a member of a team of consultants all of whom must record data on standardized base maps. Since everyone on the team works at the same scale, it is possible to consolidate several types of information into

one map or to overlay several maps on a light table. The
planning team also uses tables with standardized formats to
express data in ways which will be readily usable by the others.

Stan King, another of the planning consultants
interviewed, and an architect by training, has developed a
planned methodology around his ability to do quick perspective
sketches. Although Stan King has used finished presentation
sketches often in the past, he is now in "a new phase" where
he is no longer satisfied with creating images alone. He
wants to create sketch images with other people in a collective
process. He uses his technique at "design-ins" to evolve a
concept for some physical change in the environment such as a
new streetscape or a children's playground. He typically
starts with a blank sheet of paper on the wall. He asks for
suggestions regarding some aspect of the design. When one
member of the group makes a suggestion, he uses "eye contact"
with the rest of the people in the group to determine if the
idea is acceptable to them. He sees his role as asking the
questions then "playing dumb" while waiting for "group approval".
He must draw slowly and only when approval has been given. If
he is overly hasty, he must start again. He also starts a new
sketch when the group changes its mind as the image develops,
since sometimes an early idea seems less workable as a result
of new decisions.

He believes that the aim of the process is not to
produce an image on paper but to strengthen the image in the
minds of the people in the group. He feels that his sketching

talents have little to do with the effectiveness of his method.
In fact, sometimes a bad artist does a better job of developing
the mental images of the group because the group members must
work harder at maintaining their internal image of the design.
At the end of the process, the group feels that they created
the image. He has recently begun to ask group members to
sign the sketch which they always do readily. If they ask him
to sign, it is only as an afterthought. Once the image has
been drawn, it can be expressed in words. These words, for
which the drawing acts as "a catalyst", seem to be a better
description of the group's mental image than the drawing itself.

The "design-in" is actually only one step in a more
complete planning process. The first step is to look at ex-
isting conditions. The proposed activity is considered and
the necessary environment for the activity is defined. Then
the "design-in" provides pragmatic ideas. However, the image
from the "design-in" represents an ideal. It is necessary to
work out priorities with reference to legal, fiscal, and
governmental realities. A realistic design decision can then
be made and carried out.

Simon Scott is an architect and graphics specialist
in a large architectural firm which has a planning department.
He explained that the planners he works with often ask him to
prepare photographs and drawings of the areas they are studying
for research purposes. At a later stage, these pictures may
be incorporated into the final presentation graphics. Planning
concepts are often expressed in graphic form. A popular method

is to draw, map, or write ideas on large file cards which are mounted in strips on the walls and can be rearranged or discarded as needed during the planning work. Three-dimensional models, which are often used for presentation purposes, have been adapted for such uses as space planning with clients participating in the process.

Philip Aldridge, the manager of a firm which builds topographic models, confirms that a number of the models ordered from him are intended as working tools in planning organizations. In most cases, a model is made of the existing topography to be used to help visualize alternative locations for some proposed physical change such as gravel pits or transmission line towers.

The second category of uses for graphics is the communication of planning ideas to people outside of the planning organization. The graphics prepared for these purposes tend to be more tightly structured and formal than those used for communication among the planners themselves. For this reason, graphic specialists are frequently brought in to participate in the preparation of these graphics. Of the people outside the planning organization who have planning information presented to them, it is useful to distinguish two groups: the clients who have directly requested the work and the public who is to be somehow affected by the planning decisions. Clients in this sense can be municipal councils or other political bodies, governmental departments, or private people such as developers and other entrepreneurs. The public may be organized into

committees sponsored as part of the planning process or into privately initiated interest groups, or they may be unorganized.

The Overall Division of the Vancouver Planning Department addresses graphics to both of these groups: to the Vancouver City Council and to the residents of the City of Vancouver. For Council, the main use of graphics, in the view of Ted Droettboom, the Division's Director, is in conjunction with oral presentations. They serve both as an organizational crutch or "mnemonic" device for the person giving the presentation and to express concepts not suited to words such as population pyramids.

The Division has recently completed a major graphic presentation to the newly installed Council which consisted primarily of a slide show of several hundred photographs shown in tandem from two projectors and an illustrated handbook in a looseleaf binder. The slide show was prepared by five members of the Division without help from the Graphics Section of the Planning Department. The slides were loosely structured around a theme of "one day in Vancouver" and covered a wide range of issues focusing on objective information about what is occurring in the City and avoiding making planning judgements. The handbook was intended to be a reference manual for the Aldermen. Consequently, it required a flexible format to permit updating the information periodically. Hence, the looseleaf binders were chosen. Furthermore, the planners felt it should be well done to encourage readership. They believed that a polished look would encourage the Aldermen to keep it.

The Graphics Section was asked to participate in preparing the handbook. The Overall Division requested that one member of the Graphics Section be assigned to work on the project as a team member. However, this proved impossible from the point of view of scheduling within the Graphics Section. As a result, Graphics entered the process after the text was finished and ideas for the layout and possible illustrations has been established. However, the Graphics Section did not like the graphic ideas suggested by the Overall planner in charge of the production of the handbook. Consequently, the finished product was considerably different from what had been envisioned and much of the planning effort seemed wasted.

Len Tennant, one of the planners in the Division, felt that these two projects represent an emerging interest in graphic presentation in the Overall Group. He feels that, with the new Council, they have an opportunity to start to do things differently, although a few Aldermen thought their recent presentation was too costly. He hopes Council members will come to expect graphics if the various divisions within the Planning Department begin to use visual presentations before them. The Central Area Division has been the only group to use presentation graphics consistently with Council.

As for communication with the public, the main graphic production of the Overall Division is the publication of the Quarterly Review. In the view of the Division's Director, the graphic component of the Review serves three functions: to attract people to get them to read the articles, to serve
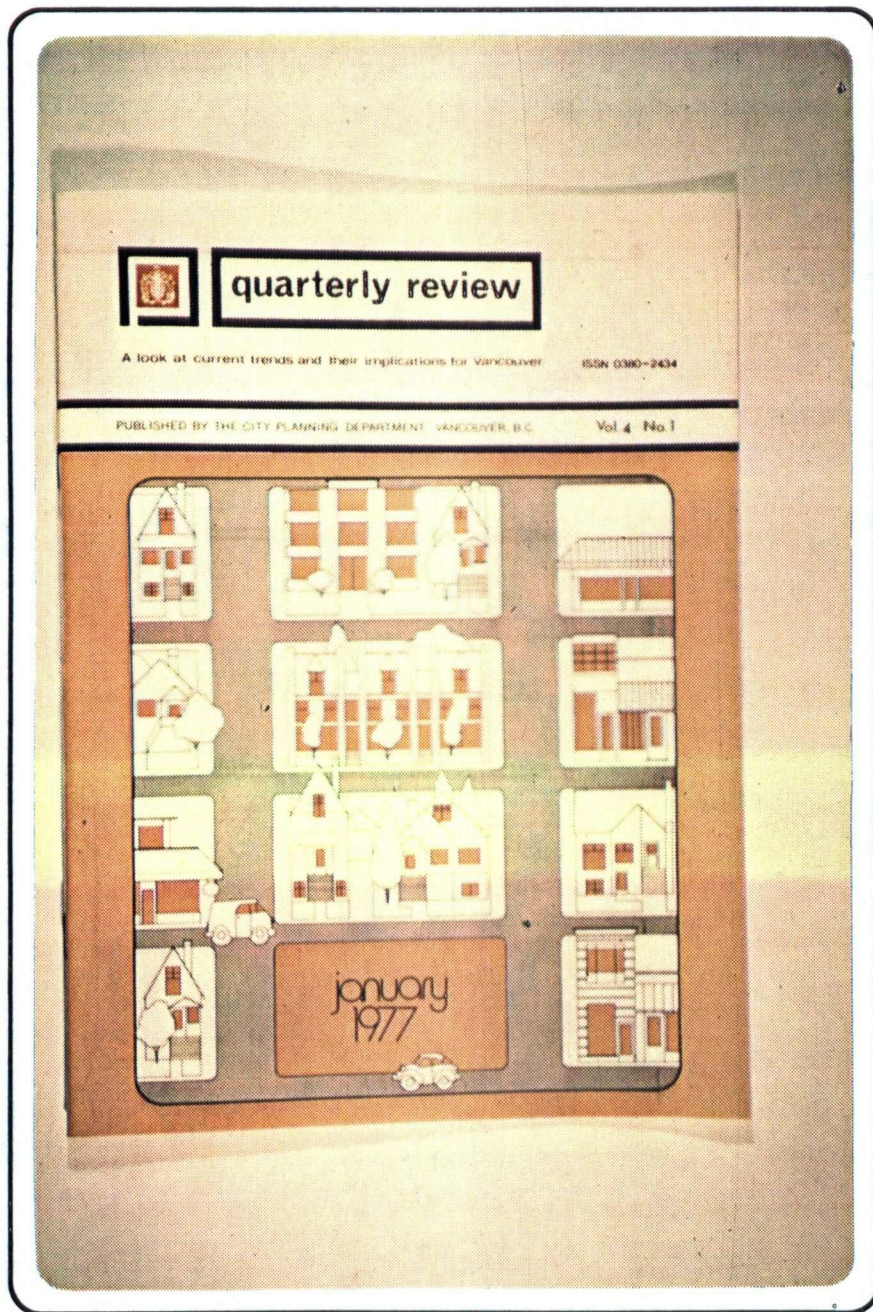
The Quaterly Review, Vancouver City Planning Department,

January 1977.

an organizational function by dividing the material into articles, and sections, and to express certain concepts best suited to a graphic format such as a map or chart.

The Quarterly Review is produced jointly by the Overall Division and Graphics Section. The articles are given to the graphic artists for layout and illustration. Some of the authors of articles suggest possible illustrations for their text. In many cases, however, the choice of illustrative graphics is not successful from the point of view of the author. For example, a photograph of conversion dwellings in the West End was used to illustrate an article on illegal suites in single family areas. In another case, a photograph of a beef steer was placed in a section of an article which discussed dairy farming. Len Tennant, who frequently writes for the Review, had never been consulted by the Graphics Section staff regarding the possible use of graphics to strengthen weak points in an article. He feels that the graphics people are primarily interested in the layout of the page. They do not try to enhance the content.

The Area Planner for Riley Park intends to use graphics in his reports to City Council. Larry Beasley feels that the public has rightfully criticized past final reports to Council by Area Planners which were written in the usual format and bureaucratic language of most Planning Department reports and were, consequently, difficult for members of the public to evaluate with respect to the events in the area planning process. He proposes to illustrate the major planning objectives

graphically throughout the text. He will probably work out the
rough sketches for these illustrations and give them to some-
one in the Graphics Section to finalize. With this approach,
he hopes that the public will feel comfortable with the report
and that Council members will still be provided with the detailed
information they expect.

To date, his major graphic production for the
general public in the Riley Park neighbourhood has been a series
of flyers announcing public meetings. For these leaflets,
he devised a cartoon strip called "The Life of Riley". The
purpose of the cartoon was to build an identity for Neighbour-
hood Improvement Program and to raise the enthusiasm of the
public enough to bring them to the public meetings. The
characters in the cartoon were developped to have distinct
personalities. They were to look as if they could be residents
of the area. Since there are many new immigrants in the Riley
Park neighbourhood who speak English poorly, the characters
had to express enthusiasm through body language. The words
were kept simple and "treated as secondary". He based his
concepts on his knowledge of the local area. He believes
that the resultant product would not be appropriate in other
parts of the City. He also has plans for setting up "design-
ins" for members of the public, particularly high school
students, in the near future.

The planner who coordinates the Champlain Heights
development process, although knowledgeable about graphics,
does not find much use for graphic techniques when he presents

LIFE OF RILEY.   (Graphics designed by Larry Beasley.)

information to Council. While he will take maps and architect-
ural plans to an oral presentation to Council, he does not

use the design guideline material which is prepared by his

consultants. In fact, he feels that there is a high failure

rate for those relying on more innovative graphics to

present their concepts to the Aldermen. He believes that the

material prepared for developers and architects or for the

public would not be suitable for Council. He prefers to use

the standard report format which all civic departments use

for Council reports.

The graphic design guidelines are prepared by the

consultant architects for the use of developers and their

architects. Consequently, they can be successfully aimed at

a visually sophisticated audience. The general public is

exposed to other graphic methods: a slide show which has been

in use for three years, topographic models which he believes

the average person understands better than perspective drawings

or architectural plans, and newsletters which are prepared by

a consultant specialist.

Keith Bennett, the head of the Graphics Section with-

in the Vancouver Planning Department, is responsible for the

group of draughtsmen and graphic artists who produce much of

the Department's graphic aids for use with both the politicians

and the public. However, the majority of their work is for use

by the public. They are rarely called on to produce graphics

to be used for Council meetings. The visual material that

they do prepare on a regular basis for Council's use is mostly

in map form. For example, they make coloured zoning maps of every rezoning application in a standard format to be used for all meetings concerned with the application including Council meetings. Standard, regularly repeated jobs constitute approximately 85% of the Section's work load. These tasks include updating zoning maps, producing maps for by-laws, and preparing publications such as newsletters and the Quarterly Review. Only 15% of their work involves one-off projects such as report layouts. Hence, the handbook for Council initiated by the Overall Division represents an unusual assignment for the Graphics Section.

Ted Rashleigh, who has until recently coordinated the use of graphics for the Planning Department of G.V.R.D., stressed his interest in graphics as an important aspect of presentations both to political groups and to the public. He felt that politicians are generally fairly hostile towards the use of graphics, especially those generated by computers. He believes that politicians tend to be verbal people and, therefore, to distrust visual media. Consequently, it is best to subordinate graphics to words in an oral presentation, and not to use slick visual material with political groups. As for public presentations, he thinks the role of graphics must be determined after the objectives for the meeting have been set. The graphics will then be appropriate to the current stage of the planning process. If the purpose of the meeting is merely to provide the public with information, a highly packaged graphic program such as a slide show with a taped narration

could be used. However, since most public meetings are arranged to obtain feedback from the audience, a less planned and more interactive, response-oriented format would be desirable. An overhead projector with prepared transparencies might be a workable choice since the pace can be altered to suit the mood of the audience and the amount of material can be made flexible to adapt to the attention level of the group.

The G.V.R.D. provides the public with information about its activities through regular newsletters and press releases which are prepared by Bud Elsie, an external consultant. He also provides a newsletter service for a number of local municipalities. He produces the written material for these publications as well as the graphic illustrations which are predominantly photographic. He also chooses the layout for the newsletters based primarily on budgetary restrictions.

Burnaby is one of the few local municipalities to produce its own newsletters. According to Dennis Bedgeley, the graphic artist who is responsible for all the graphics for the Burnaby Planning Department as well as other Burnaby civic departments, the Burnaby Planning Director has put a high priority on good graphics for years. However, while many of the reports intended for the public are given considerable graphic attention, very little graphic work is prepared specifically for presentations to Council. Usually, each Council member receives his or her own copy of a report con-taining all the necessary information for consideration. These reports contain little in the way of graphics unless they are also to be given to the public or to an external group.

A planning consultant on aesthetics and environmental
impacts who uses perspective sketches regularly in his work
feels that his graphics are successful when used for communicat-
ing concepts to the general public. He feels that untrained
people who have trouble understanding plans can visualize the
effects of the proposals from his sketches. However, he has
been instructed by several clients, particularly governmental
agencies, not to include drawings, maps, or other graphics in
reports. He feels that many people ignore graphics in the
belief that they are "costly extra frills" which provide no
additional information beyond what is included in the text.

Andreas Naumann, a consultant who prepares the land
use planning components of environmental studies as part of a
planning team, feels that the graphics in his reports, which
are predominantly maps, are designed for use by technical
specialists both within the clients' organizations and in re-
lated government agencies as their first priority. However,
the maps are printed in several colours. The colours are
intended to provide a simpler level of information suitable
for untechnical people since a number of coded technical
categories are grouped together by one colour. In a sense,
the detailed information provided for the technical people
usually is hidden by the overlaid colours intended for use by
the public. For example, twenty types of ecological units
included in a series of maps may be grouped in three colour
categories which depict only their sensitivity to the pro-
posed intrusion being studied. Sketches and photographs are
also used in reports, in large part for the benefit of the

ROUTE SELECTION STUDY. 500 Volt Transmission Line. Nicola, Selkirk, Cranbrook. Phase 2. Ian Hayward and Associates Ltd. Vancouver, B.C. July, 1976. (Graphics by Janet Lee).

public. Topographic models have proven to be the most useful
graphic technique for conveying information to the public at
meetings.

Stan King, the consultant who presently specializes
in developing sketched images with public groups, clearly
believes in the efficacy of his technique with that type of
group. His clients, often in planning or other governmental
departments, hire him specifically to do graphic work with the
public. However, he rarely works with images for presentations
to governing bodies. He believes that there are difficulties
with using images before politicians, especially in the form
of slide shows. He thinks that the main concern of politicians
is how they can influence their fellow members. For this
reason, they need to be constantly watching each other and,
consequently, they treat a graphic display as an intrusion.

Simon Scott, the graphic artist for a large architect-
ure and planning firm, explained that most of his organization's
work has an urban design orientation. In the majority of this
work, the graphics are not only for the immediate client but
also for presentations to concerned governmental bodies and to
the public. Therefore, because one presentation is usually
shown to several different audiences, there is little
opportunity to direct it's focus to the particular level of
understanding of one group.

Except in the rare cases where a planner takes re-
sponsibility for producing his or her own graphics, planning
graphics for communication to people external to the planning
organization are prepared by specialists at the request of

planners. The methods used by planners to communicate their
ideas and needs to the graphic artists are crucial to the
effectiveness of the finished products. In the interviews,
the planners were asked to explain their preferred communica-
tion methods while the graphic artists were also requested to
describe the process by which they come to understand the
planners' objectives. The stage of the planning process when
the graphic artist is first consulted is an aspect of the
method communicating objectives. The amount of advice sought
from the artist by the planner is another valuable indication.
Graphic artists are given different degrees of freedom to use
their own initiative. The decision to use a particular
medium, to apply a certain graphic technique, or to use a
specific colour may be made either by the planner or the
artist separately or in consultation with each other.

In many planning organizations, the method for
communicating between the planners and the graphic specialists
is dictated to some extent by the structure of the organization.
The amounts of time and money budgeted for graphic work by
both planners and graphic designers by the organization are
major constraints on the quantity and quality of the planning
graphics which are produced.

In the Planning Department of the City of Vancouver,
the Graphics Section is responsible for the production of the
bulk of the departmental graphics. Ted Droettboom, the head
of the Overall Division in the Department, describes the
process used in communicating objectives to the Graphics Section

as "iterative". Usually the planner will provide Graphics

with a general idea through an informal verbal description.

The artist in the Graphics Section is then given the

initiative to prepare a draft concept. In the next step,

the planner reviews the draft and may ask for changes. Usually

two iterations are sufficient to satisfy the planner, although

infrequently a second draft will be requested by the planner

for review before the graphics are finalized. He feels that

this approach permits the planner to decide if the graphics

will be appropriate for the intended audience without needing

to explain the planning requirements to the graphics specialist

in detail. He believes that it is very time consuming to

bring a graphics specialist into an awareness of the planning

principles involved in a project. Basically, he believes

that the planner and the graphic artist have different concerns.

The planner's goal is communication while the graphics

specialist's goal is aesthetic balance. The review of the

graphic draft by the planner, therefore, serves to protect

against the tendency of the graphic artist to redesign the

author's intention to meet graphic goals.

For most graphic jobs, he feels that the planners in

the Department tend to treat the staff of the Graphics Section

as technicians. Consequently, they are not usually consulted

until the end of the planning process. In the case of the

recent slide show by the Overall Division, he regrets the fact

that a member of the Graphics group did not participate from

the beginning of the project. According to a planner in the

Division, this idea was vetoed by Graphics due to scheduling constraints. In the future, if he has another chance to do a similar project, he would hope to get a member of the Graphics Section into the working team from the start.

In most cases, especially since the Graphics Section is not consulted early in the planning process, the planner chooses the medium to be used. The planner also recommends the ideas for specific graphic purposes. However, the graphic artist suggests techniques and styles through the preparation of drafts.

Keith Bennett, the head of the Graphics Section in the Planning Department agrees that, in general, the planners ask Graphics to "pretty-up" their work once the content is produced. He concurs that planning is basically a communications process. However, he thinks that, while planners profess that communication is the major part of planning, they do not always act on this belief. Specifically, he thinks that they neglect the use of graphics as a communication tool.

He is dissatisfied with the present methods the planners use to explain their needs to his staff. He believes their ideas are too concrete when they approach the members of the Graphics Section. As a result, they are unwilling to work with the graphic designers or to consider other graphic possibilities. A major source of difficulty is that many planners think that they are graphic designers and, hence, do not respect his staff's expertise. He does feel, however, that the situation is improving. Primarily at the instigation

of Graphics, he believes that the Planning Department is trying to involve members of his group at an earlier stage. The graphics are being decided in the initial phase of a few current projects. He expects this change will reduce the total time spent by his staff on these projects.

According to Ted Droettboom, there is a departmental policy against having graphic specialists within the various divisions. He believes this partially represents an attempt to have the departmental graphics appear consistent. The head of the Graphics Section agrees that his group is under pressure from the Director to have an integrated style for departmental graphics. He feels that this concept should be carried even further and that all the City's departments should have a certain graphic image. Consequently, he believes that the Graphics Section should be removed from the Planning Department and integrated with the Printing Department as a separate Graphics Department within City Hall. At the present time, Graphics does design work on an unofficial basis for other City Departments such as Social Planning, Finance, and the City Clerk's Office. However, any work for the Planning Department is given priority over the needs of the other groups. In spite of this fact, the planners in the Overall Division complain that they tend to avoid working with Graphics due to recurring scheduling problems.

The Overall Division is responsible for the coordination and budgeting of a number of graphic projects which are completed by the Graphics section. For example,

they prepare City Land Use Maps which are printed in four colours. The Graphics group prepares the manual colour separations from rough information given then by the Overall staff. Over half the cost of producing the maps involves the preparation of the separations. For a run of 1000 copies, the total budgeted cost works out to over five dollars for each map. Two recent reports with minimal graphic input averaged approximately ten dollars a copy for a small run of 50 copies each. For a typical departmental report of 100 pages, a large run would reduce the cost to three to five dollars per copy. The graphics involved would include a cover design and a few internal illustrations, probably maps. The Quarterly Review costs less than fifty cents per copy of which one-third is required for the graphics input. This cost does not include the time spent by departmental planners in writing articles.

The recent slide show and handbook produced by the Overall Division represents a significant diversion from the usual amount of time budgeted for graphic work within that group. Four people worked almost full time for two months on these projects. Much of this time was devoted to taking and sorting slide photographs and to planning the graphic elements of the handbook. Len Tennant, a planner in that Division, stated that the time he spent on graphics prior to this project was negligible. However, he now believes that graphics are essential to getting written material read and will, therefore, require a larger portion of his time for planning graphics in the future.

It is difficult to determine how much time and money is spent on graphics in the Planning Department since the staff does not keep records of their activities in these terms. However, as far as the fairly formal graphics prepared by the Graphics Section are concerned, they are assigned about 8% of the Department's total budget.

Larry Beasley, the Area Planner for Riley Park works with the Graphics Section at City Hall primarily for the graphics he needs which require printing. The fact that Graphics arranges for all printing for the Department insures that they review his material. For example, someone from Graphics prepared the final draft of his "Life of Riley" cartoon announcement. Graphics will also do the layout and illustrations for the Area's newsletters. To communicate his objectives to a graphic artist, he usually will start with a sketch of his idea and will supplement it with a verbal explanation of his intention for the elements in the sketch. He might, for instance, want a specific cartoon character to look enthusiastic or would describe the housing styles that are typical of the local neighbourhood. He feels that it is important to discuss his ideas with the artist before they become too detailed. He finds that graphics people get annoyed if they are not given the chance to use their own initiative. The Graphics Section members are not used to following instructions. He, therefore, discusses his ideas with the artist to develop a mutually agreeable solution through a team approach. He believes he is in an unusually good position to work with

Graphics and obtain a satisfactory product. For one thing, he feels that he understands graphic concerns and problems. Consequently, the artists respect his graphic abilities and are less able to impress him with superficial solutions.

Larry Beasley believes that the present structure of the Graphics Section is too centralized. He would recommend that each division or site office should have a graphic specialist assigned to it. This system would promote a "team feeling" within each division. The graphic artist would come to know both the specific projects and the planning staff. There would be a consequent improvement in the value and use-fulness of the graphics.

Larry Beasley estimates that approximately 10% of his time is spent either supervising others who are doing graphic work or designing preliminary or working graphics himself. However, there is no specific category in his office's budget for graphic work as such. Newsletters and leaflets are budgeted as separate items. He feels that working graphics, as one type of planning technique which can be substituted in many instances with other methods by planners who are not skilled in graphics, could not be budgeted for explicitly.

The job of Jim Moodie, the planner who coordinates the development of Champlain Heights, is independent of the Planning Department and, hence, he does not rely on the Graphics Section for his graphic needs. Instead, he uses a number of outside professionals to prepare his visual material. Although he is a graphic artist, he does not prepare sketches to

communicate his objectives to graphic artists. He prefers to rely on their professional judgement. He feels that an artist should be able to listen to his verbal description of his needs and come back with good results. He will try to tell the artist what he is aiming at. For example, he will suggest a tone to be conveyed by the graphics. He relies on the professional to know how to approach an audience to best reach it. In the case of newsletters, he contacts the specialist who prepares similar letters for the G.V.R.D. and local municipalities to undertake the whole production: writing, photography, and layout. He contacts graphic specialists both to dress up planning work which has been completed and to become involved early on in a project which depends heavily on graphic expression. However, the graphic artist, even in the case of early involvement, remains a "weak member" of the team. His budget estimate for graphics, based on a recent marketing package project, is approximately 10% of the total sum allotted.

Ted Rashleigh described the process by which planning objectives were communicated to the graphics staff of the G.V.R.D. Planning Department while he worked there. Since he functioned both as a planner and as a graphics and presentation specialist, he usually served as the communication link between the others in these two groups. He explains that he tended to be "at the elbow" of the graphic support staff providing supervision and direction on a day-to-day basis. He tried to keep the graphic staff aware of changes in the planning requirements. However, the rest of the planning staff, he feels, had

trouble talking to the graphics staff, particularly in the case of one especially well qualified artist who was working there for a period of time. Specifically, he believes that the planners did not usually understand the graphic limitations of various media and were not willing to listen to an expert opinion.

He believes that it is essential to have one person in a planning organization who knows both the planning and graphics approaches. The management attitude at the G.V.R.D. was that all the staff were to be used for what they were best at doing. In his case, he was concerned with the human, communications aspect of the planning process. His graphics abilities suited him to coordinate the graphic work of a graphic designer who produced the artistic concepts and of a graphics specialist who had a practical knowledge of production methods. He was also in a position to plan the graphics from the initial stages of the planning process.

Gordon Cleasby, the graphics specialist in the G.V.R.D.'s graphics group, explained in a telephone conversation that his role is to get graphics produced as he is directed by the planning staff. The planners tend to ask for a spedific product in a media they have already decided upon. Most of the work is requested at the last minute. Consequently, the planners do not explain the planning objectives of their requests.

The time and money budgeted for graphics in the G.V.R.D proved difficult to determine for Ted Rashleigh. He estimated that between 5 and 10% of the departmental budget is

spent on preparing and reproducing graphics including computer
time for computer graphics. However, this estimate does not
include the time spent by the planning staff on preparation for
presentations involving the use of graphics such as slides or
overhead transparencies. In certain weeks, such work might
absorb 80 to 90% of the planner's time. If the time spent by
the planning staff were to be included in the estimated average
for the department, the figure might be as high as 25%.

Bud Elsie, the ex-journalist who prepares newsletters
for the G.V.R.D., Champlain Heights, and a number of local
municipalities, feels that he is given the initiative to pro-
duce these newsletters as he judges is best. In general, he
is not given detailed instructions from the departmental
officials who hire him. The information for written portions
of the newsletters comes from two major sources: reports
and documents which were prepared for other purposes such as
board or council meetings or draft articles by departmental
staff members which are requested specifically for the news-
letters. He explains that he uses a newspaper style of writing.
He attempts to be non-political. He does not mention specific
politicians by name in the stories. No attempt is made to
influence people to change their minds on specific issues.
While some people feel he should stress ideas or concepts, he
favours facts. Senior staff in the governmental departments
review a draft of the newsletter before it is finalized and
printed. While a story is removed from time to time if some

change in its status has occurred of which he is unaware, he has never been asked to make changes in a story to alter the emphasis. He also makes it his policy not to write anything derogatory about a municipality or the G.V.R.D. in any newsletter. The major graphic aspect of his work, aside from the layout format, are photographs, most of which he takes himself. The clients rarely supply him with either photographs or other graphics such as sketches, maps, or charts. Occasionally, he may request some graphic material like an architectural sketch of a new building which is to be built in the community.

In general, the newsletters and other brochures and pamphlets which Bud Elsie prepares for planning purposes represent a very small fraction of the budgets available to his clients' organizations. The typical charge for the complete preparation of a four-page newsletter with an average of seven photographs is under a thousand dollars. Printing and distribution costs are additional but hardly prohibitive.

Dennis Bedgeley, the graphic artist for the Burnaby Planning Department explains that the planners in the office respect his artistic expertise. At his initiation, the planning staff has learned to consult with him very early in the planning process. He wants to get a feel for the graphic requirements of reports before they are completed so that he can schedule the preparation of maps, photographs, and other visual material. Of his time, he spends approximately 80% on the production of graphics for printed material and the remainder on other forms of graphics such as presentation work. However, he did not know the percentage of the departmental budget which is devoted to graphics

Dougald McDonald, the aesthetics and land use planner who uses perspective sketches extensively in his work, does the bulk of his own graphic work including report layouts and maps. He, therefore, does not have to communicate his planning objectives to someone else who is responsible for graphics. He feels that graphics are an expensive use of his budget as a consultant. However, they are a quick way to convey certain types of information. As a result, the portion of his time which is spent on graphics varies considerably with the nature of the project. In fact, the graphic component of his work has been as low as 5% of his time and as high as 90%.

The land use specialist for environmental planning projects also coordinates the graphic aspects of the work of all the consultants on the team participating in these studies. Andreas Naumann serves as a liaison with the graphic artist who produces the final graphics. This graphic artist participates in the team as a subordinate member from the initial stage of a project. He consults with the artist regarding decisions which affect the usefulness of the graphics. For example, they discuss the choice of a base map of the appropriate scale or level of detail and which elements on the map should be emphasized to help people orient themselves easily. They also discuss how several types of information can be combined while still retaining the necessary clarity and how production costs can be minimized. He feels he is ultimately responsible for these types of decisions. However, the graphic artist retains the decision-making initiative with regard to aesthetic matters

like the choice of colours, type faces, and shading techniques.

This consultant believes that from 1/3 to 1/2 of the paper volume in an environmental planning office is comprised of maps. This dependence on maps is reflected in their budget allocations. For working graphics, the typical consultant will spend between 20 and 40% of his or her budgeted time with maps. The purchase of aerial photographs for planning purposes may absorb as much as 1% of the total budget of a large project. Presentation graphics take about 20% of the total budget. This is split approximately evenly between printing costs and graphic design services. However, the design work alone may represent almost 20% of the time spent on a project since graphic artists receive lower hourly wages than the planning professionals.

Janet Lee, a graphic artist who designs for environmental planners primarily but also for other planning organizations as the G.V.R.D., thinks that most planners treat graphics as "an addendum" to their work. She prefers to be brought in as a concultant during the early stages of a planning project. Fewer mistakes which waste time and money are made if the graphics have been planned from the beginning. If she is consulted as a project is starting, she has an opportunity to sell the planners on an appropriate method and to show them how graphics can serve as a tool in their work. In some situations, she does become "a subordinate member" of the planning group.

The approach that the planners take to communicate their needs varies with the timing of her graphic input. In

general, she feels that many graphic decisions are constrained
by planning criteria such as the level of detail of the
available information and the project's terms of reference. The
more sophisticated planning procedures call for more complicated
graphic techniques. She finds that planners often think that
they are artistic. They also frequently believe that graphics
are merely decorative. Sometimes she is given very specific
instructions regarding every detail of the finished product.
Often such instructions fail to use graphics effectively. She
must be careful not to imply that a planner is wrong about
graphic requests while she suggests changes and improvements.

As a general rule of thumb, she recommends that 10%
of the budget for a planning job should be spent on graphics.
The actual amount will vary depending on the intended audience.
For instance, if public participation is a part of the terms
of reference, then more than 10% might be advisable. In the
case of a printed report, approximately 1/3 of the graphics
budget would be spent on design work and preparation while the
balance would represent printing costs.

Philip Aldridge, the manager of a topographical model
firm, feels that the crux of his work on a day-to-day basis
involves understanding the clients' problems and finding a path
to a solution. He thinks that various predetermined constraints
define much of what will be displayed on a model. Unless
clients have used his services in the past, they do not usually
ask for specific techniques. Frequently, on large projects,
the client requests a formal proposal from him which explains
the details of the solution which he has devised.

He feels that most clients believe in their designs. Consequently, they rarely request a purposeful distortion in a model. Although small defects can be downplayed, major distortions would be obvious to the viewer. There is an unspoken understanding that a model must be aesthetically prepared. A model is viewed both as an artistic work and as a representation of reality. In one case, he was asked by a large development company to leave the countryside around a proposed development bare of vegetation so as not emphasize the beauty of the countryside which would necessarily be harmed. However, the opportunities for attempts at manipulation of a model's impact are limited since physical shapes and site dimensions cannot be altered. He feels that no one in Vancouver is sophisticated enough to use colour for its psychological impact.

The stage in the planning process at which Philip Aldridge is contacted varies with the purpose intended for the model. If a topographic model is to be used as a working tool in a design process, he will be brought in early. However, most planning projects are at such small a scale that he is usually required only to "doll up" a design for a public presentation. He has, in the past, heard complaints from planners about the cost of the models his firm makes, although they rarely exceed 1% of the total budget on a project. He believes, however, that attitudes are changing and that more planners now recognize the value of a model.

Stan King, who has recently been concentrating on "design-ins", is usually hired by clients who are acquainted

with his methods. The design process, described previously,
which he advocates involves an initial decision, based on a
study of existing conditions, about the desired planning change.
A recent project in Quesnel dealt with concepts for a cultural
centre. The"design-in," however, generates specific objectives
within a rough, general framework. In the Quesnel case, the
range of activities to occur in the cultural centre had not been
determined, although the idea of a cultural centre was certain.
Therefore, objectives are communicated to him from two sources:
general goals from the clients and specific needs from the
participating public. Necessarily, this input must take place
during the course of the planning process.

The financial cost for a "design-in" is usually
around a thousand dollars. The time involved is much greater,
however the public and local assistants do much of the work
through their participation. Consequently, a "design-in"
generates a great deal of information for use in the planning
project at a very small fraction of a total budget.

Simon Scott, the graphic designer for a major
architectural and planning firm, explains that the planners in
the office communicate their planning objectives to him in
"fair detail". He believes a mutual understanding has developed
among them in the course of working together. Ideally, he
would like to be consulted at the beginning of the work process.
When he is, a gradual meshing of ideas evolves through the
project. However, the planners usually contact him near a
project's deadline. The planners in his office are not

graphically-minded nor are they knowledgeable about graphic techniques. Therefore, while they set the objectives, an interactive process is needed to make decisions regarding graphic design. Even the colours and layout are mutually agreed on.

The portion of the budget for a project devoted to graphics varies greatly with the type of assignment. Design oriented projects may require 25% of the budget for graphics. In general, models and photography are the domenant graphic devices used by their office. Printed graphic material may be about 30% of the office's graphic output.

All the people interviewed, both planners and graphic specialists, described their knowledge of graphics and planning. They discussed their formal education in these areas as well as the sources of any informal learning. Certain of these types of knowledge had proved to be more useful to them than others. Many also mentioned topics which they would either like to study formally or to experiment with informally. Their own backgrounds and experiences naturally suggested ideas to them about the relative values of various courses of study for planning students.

The first professional planner interviewed has a graduate degree in planning. However, he learned very little about graphics as part of his degree program. He did some graphic work as part of his first job in the planning field. Although he has looked at some books on graphic presentation, he feels that his own evaluation of graphics is based on his

experiences with what has seemed effective in the past. One of the potential problems he recognizes may occur with graphics are that simple planning concepts may be made more complicated than they need to be if complex graphic styles are employed.

He believes that planners should have an appreciation of graphics but not the ability to do graphics themselves. He thinks that graphics are not a productive use of a planner's time. Specifically, planners should understand printing processes, the uses of various media, and the problems which arise with various techniques.

One of the other planners interviewed had not studied planning formally. He became a planner through working after completing an undergraduate degree in geography at U.B.C. As part of his geography course work, he learned cartographic techniques. He finds this information of considerable use in his work. He refers to several texts periodically which describe such techniques as how to set up circle charts which appear to be proportional. He has offered these books to the graphic artists who work with him but finds that they are not interested in using theoretical graphic techniques.

A planner who is a recent graduate of the School of Community and Regional Planning at U.B.C. explains that he started his formal education in graphics in architecture school. He has also taken fine arts and urban geography courses during his undergraduate studies. Due to his prior training, he used graphics when possible in his graduate courses. Informally, he has always been interested in drawing and sketching. He has

also worked as a draughtsman and graphic artist for engineering

and architectural firms prior to becoming a planner. He has

studied such things as colour theory and advertising methods,

both in school and on his own. He hopes to experiment with

video equipment for a public participation project in the

near future.

This planner feels that it is a "tragedy" that graphic

techniques were not taught to those attending planning school

with him. A number of people did experiment with photography

which he feels is an easy medium for people without artistic

experience. However, he believes that photographs have

limited value for planning purposes since they record only

present conditions and cannot express proposals for the future.

He suggests that three subject areas should be taught in plan-

ning schools: printing methods including simple techniques to

prepare material for printing; "the strategic use of graphics

in the planning process"; and technical skills such as lettering,

sketching to be able, at least, to record site inspection in-

formation, and understanding architectural drawings. Planners

should at least be able to use graphics as an easy means of

"compact notation".

Furthermore, he feels that graphic artists who work

with planners do not need to know general planning theories.

However, they should be familiar with the planners they work

with and their concerns regarding particular projects. Since

graphic artists influence the effectiveness of the product

of the planning process, they should understand the politics

of the situation, the character of the area which is being

studied, and the nature of the specific planning process.

Another professional planner interviewed also ob-

tained his formal education in planning at the School of

Community and Regional Planning where he stressed urban planning

and took a number of courses in the School of Architecture.

His interest in graphics has always been with him. He draws

in his leisure time. As an undergraduate, he majored in fine

arts with an emphasis on studio work. Due to this studio

emphasis, he believes his acquaintance with colour theory or

other theoretical graphic techniques is minimal. He has

never studied advertising. He stated that he feels planners

should only study graphics if they are interested in the

subject. He conceded, however, that an understanding of the

mechanics such as printing processes or time constraints

could be helpful.

An experienced planner who until recently worked at

the G.V.R.D. became a professional planner through working

rather than formal training. He has some fine arts courses in

his background but never studied graphics formally. He feels

he has learned through practical experience to work with

presentation graphics. At first, he found it was difficult

to communicate his concepts to visual specialists. He had to

learn graphics as a "new language". He developed a way to

write scripts for presentations which expressed his ideas in

a way that suited the nature of the graphic medium. He has

investigated the literature on graphic techniques and finds

that there is not much of value for planning purposes except

for some studies of methods to encourage public participation.

He feels that it is important that at least one

planner in an organization should be able to work competently

with graphics. Graphics specialists, especially ones trained

in architecture, tend to ask planners what they want to say

and offer to translate it into a graphic medium which they

choose. They take the responsibility for understanding the

message and interpreting it to the audience. However, since

they are laymen with regard to planning, they tend to lose the

subtlety of what the planners were trying to express. There-

fore, such graphics are in danger of becoming a charicature

of the planners' meaning.

A third graduate of the School of Community and

Regional Planning was interviewed. He presently specializes

in aesthetic and land use planning projects. Although he

uses graphics, primarily in the form of sketches, on a regular

basis in his work, he has not studied either graphics or fine

arts as part of his formal education. He has always been

interested in drawing, a skill which he developed to aid him

in personal woodworking projects. He feels that he is un-

aware of any of the theoretical aspects of graphic technique.

He improves his graphic skills by paying attention to good

graphic work by others both within and outside the planning

field. He reflects that he was never encouraged to use

graphics while in graduate school. The positive response from his clients to his graphics will, he feels, lead him to experiment further. He hopes to use film in the future to explore people's reactions to changes in various types of landscape.

One interview was conducted with an environmental planning and land use specialist who entered the planning field through work experience instead of formal education. He has no formal graphics training either, although he has some practical knowledge of craft work and fine arts. He has developed his awareness of the value and possibilities of graphics through his work. He feels it would be impossible to do environmental and land use work without a high level of graphic expertise. Planners need to learn a graphic vocabulary, he believes, which includes the possibilities of various media, available varieties of typefaces, page layout concepts, paper types, printing processes, xerox methods, and the relative costs of different techniques.

Among the graphic artists who were questioned, one received his formal education in municipal engineering. He, therefore, learned draughting. The material he studied had a partial planning emphasis, especially with regard to site analysis. From draughting in engineering jobs, he learned how to draw renderings. He changed jobs several times and eventually became the supervisor of a graphics group working with planners. He feels that his knowledge of graphics is mostly self-taught, although he has taken some graphics and fine arts courses. He

reads constantly about graphics on such topics as colour

processes and printing techniques. He has not taken any official

courses in planning, although he finds that what he does know

about planning concepts and terminology helps him in his job.

His readings of planning documents do not often relate

particularly to planning in a municipal situation where long-

range planning is difficult with a changing Council. He tries

to teach his staff a feeling for the political realities of

planning so that they will produce graphics which are

appropriate for their intended purposes. He also believes that

planners should understand enough about graphic methods to

have an appreciation for their limitations.

One other graphic designer working within a

municipal planning department was surveyed. He has a degree

in commercial art from the Vancouver School of Art. In

addition to his graphic expertise, he is a painter. He has

not studied planning either formally or informally believing

that it helps him not to be biased by academic planning notions.

He finds that his education and past working experience in the

field of advertising helps him to aim his graphic work at the

intended audience. He thinks that planners should know about

graphics only as part of a general background in the

humanities.

Another graphic specialist developed his present

work of preparing newsletters, brochures, and other written

and graphic material for a number of clients including planning

agencies out of a career in newspaper journalism. He taught

himself photography. He uses "newspaper style" photographs as the major source of illustrations for his graphic products. His layout concepts have evolved through experience. He tests drafts on the people around him to see if the ideas work. He uses only a few colours exclusively which have proven themselves to be highly legible. He has never studied planning in a formal situation, however, he covered the G.V.R.D., City Hall, and local municipalities for years as a reporter. This experience has given him an informed perspective on the material with which he now deals.

One of the graphics consultants explains that she took a rather indirect route to her present career. Although she took some fine arts courses as an undergraduate, she majored in English Literature. She did not study graphics or even draughting. While she was in school, she worked as a commercial silk screener and learned commercial art on the job. She was then offered art work for a planning firm. She feels that most of her best information has come from printers during discussions with them regarding various methods for achieving desired effects. She regularly reads about commercial graphics and art techniques. She believes that colours can be used to influence the audience for a graphic product. The planning theory she has learned has come from working with planners over a number of years. However, she does not feel it is important for her to know about planning to do her work successfully.

The manager of the firm which produces three-dimensional models attended the School of Architecture at U.B.C. He studied fine arts as an undergraduate although not in the area of graphics. He believes that his academic training represents a low priority input into his present work, although he credits his architecture training with providing him with valuable exposure to a design-oriented environment. He finds graphic, advertising, and psychology theories of no use in his business.

The graphic designer for an architectural and planning consultant group studied graphic techniques at the same time as he studied architecture. He did not learn theory or advertising methods. His knowledge of planning comes from involvement with joint architecture and planning projects. He improves his own graphics by studying graphics in recent publications, especially European magazines. He feels that graphics in Vancouver are generally poor.

The final graphic designer to be mentioned is also a professional architect and a planning consultant. He studied graphic skills, especially sketching, in architecture school. He has improved and expanded his technique through his years of practice including technical graphics and perspective sketches for sales purposes. He discovered that sketches could be "very powerful" persuasive tools. In fact, he worries that an image may be too powerful in that it is difficult for others to counteract with their own ideas. He developed a method of designing by producing a series of

quick perspective sketches first which were translated into plans later after client approval had been given. He found that other design professionals had difficulty working with this method.

He came to the School of Architecture in Vancouver to write his masters thesis on working with children in architecture. Since that time, he has been working primarily with image sketches in various levels of detail dependent of the purpose for which they are being used. He uses drawings predominantly because he can communicate very quickly with them to most people. He believes that his "images" communicate on the basis of people's experiences. In some cases, words are needed to amplify the "images". He recommends that planning graphics should use more images. Planners should consider the effects of the media they use on the public. He feels that maps are difficult for most people to read. Many planning maps are redundant, they contain more information than is necessary or pertinent. Good images avoid this redundancy. Models are also considered deceptive. They give the feeling that one can visually "walk" around in a model, but the eventual built effect of the environment turns out very different.

The interviews which have been described in this chapter reveal the widely divergent views held by both planners and graphic specialists regarding the uses of graphic techniques in the planning profession. The following chapter summarizes and analyzes the information obtained in these

interviews.   The trends identified from the interviews regarding

the importance and effectiveness of graphics in local practice

can then be compared and contrasted with the conclusions derived

from the theoretical literature discussed in Chapters 3 and 4

to suggest practical improvements tailored to the needs of

the planning field.

CHAPTER 2: ·ANALYSIS OF INTERVIEW MATERIAL

     The interview material presented in the preceding

chapter was obtained in an effort to define the value placed

on graphics within the planning profession from several points

of view. First, the specific types of graphics which the

professionals felt were of ongoing importance to them were

recorded. The situations and audiences for which these

graphics seemed appropriate were also discussed. If planners

regularly make use of certain graphic techniques, it seems

reasonable to assume that their actions imply a belief in

the effectiveness of the techniques used. Second, the people

interviewed were asked to describe the information they stressed

when discussing graphic applications with others. Specifically,

they explained how planning objectives were communicated from

planners to graphic artists to both groups' mutual satisfaction.

It would seem that the methods developed for this purpose

would necessarily reflect the important factors inherent in

the use of graphics in planning.

     Also, both the positions given the graphic specialists

within the structures of planning organizations and the

percentages of time and money allocated to graphic production

were considered as further indicators of the value placed on

graphics in general. Then, the amount of time and energy

personally invested by the individuals interviewed to learn

about graphics and planning theory, either in formal academic

settings or by individual study of some sort, seemed to be an

indicator of the value such information had for them in their

careers. They also specified which of the various types of information they had studied regarding both planning and graphics have proved to be of regular use to them. Finally, these professionals, in several cases, recommended specific graphic subject areas for study by students in graduate planning programs. Naturally, such recommendations can be expected to reflect those aspects of graphics which have proven to be of value to planning effectiveness. These indications are distilled into general conclusions regarding the ways in which graphic methods are used in the Vancouver area by planning and graphics professionals.

Graphics used by individuals and groups inside planning organizations were seen generally to stress relatively informal methods which did not often require consultation with a professional graphic artist. Individualistic graphic uses were mentioned by a few planners. Various people mentioned using charts, diagrams including the Strategic Choice Method, ideas expressed in images such as those used in Pattern Language, sketches, and maps. The degree to which an individual planner resorts to graphic expressions in his or her own personal planning processes varies considerably and seems generally to relate to the amount of experience and interest the planner has in graphics.

Both the planners and the graphic artists who work within planning offices spoke about graphic techniques used as working tools for a planning group. Many of these represent slightly more structured versions of the methods used individually. A number of the graphic methods which serve

planners as working tools involve material written on large

sheets of paper, blackboards, or other surfaces which permit

a legible, large display for groups. People write out lists,

calendars, or schedules. They use diagrams that describe

interrelationships among ideas. For example, Strategic Choice

Method as taught by Allen Hickling is used at both the G.V.R.D.

and the Vancouver Planning Department in group sessions. Flow

charts, critical paths, and other charting techniques are used.

Ideas are sketched or diagramed separately on materials such

as file cards so that they can be physically manipulated to

suggest relationships and alternative combinations. Patterns

inspired by Alexander's methods are one type of use for this

method. Design guidelines for urban design projects also can

be considered in this group of techniques in that specific

design elements are described separately with examples which

the guideline users are intended to combine into successful

design solutions. Various maps are naturally important working

tools. Overlaying maps, in the manner popularized by Ian McHarg,

was a technique mentioned by several people. Sketches were

used for a variety of purposes including recording site in-

formation, testing the workability of design ideas, and gener-

ating images of desired environmental changes in the minds of

a group. Photographs were used for research purposes in

several instances. Trial runs of presentations with graphics

intended for use with people external to the planning

organization were often developed and improved in group

situations.

The graphic techniques used to communicate planning information to the immediate clients are not always those used to reach the general public. Graphic aids to oral presentations are common to both client and public meetings. Charts, maps, sketches, architectural plans, three-dimensional models, and slide shows are all frequently employed for these purposes. There is considerable disagreement among the opinions expressed regarding the suitability of these techniques to different audiences. Rather surprisingly, there was a considerable degree of consensus on the subject of presentations to politicians. Many people stated that they were wary of using graphics extensively with political groups. Disagreement is more apparent on which graphic methods are best understood by the public. Several planners mentioned that members of the public often had trouble reading maps. Architectural plans were also cited as troublesome. Models were highly recommended by some while they were called deceptive and misleading by another. Generally, people agree that perspective sketches and photographs are acceptable graphic devices.

Printed material with graphic components dominates the graphic output of planning organizations to their clients and the public. Reports are the major mode of communicating planning results, especially to the immediate clients. Reports may be illustrated with charts, maps, sketches, and photographs which contain information essential to the understanding of the text. Considerable effort is often also invested in aesthetic aspects of reports: layout, typefaces, borders, section

headings, covers, paper choice. While these elements are frequently treated as merely decorative devices, it was pointed out that they often serve both to entice and to aid readership. Printed material prepared for public consumption tends to be in the form of flyers, newsletters, and pamphlets which are usually considerably briefer than client reports and more intensively graphic in nature. The public must be attracted to the material just before they read the text. Graphics are relied on to do this job.

A wide spectrum of methods are used by planners to communicate their objectives to the graphic artists who will produce their graphics. On one end of the spectrum are those situations where the planner has a very specific idea of how he or she wants the graphics to look. In such cases, the graphic artist is treated as a technician who must merely produce the results according to their instructions. A second method involves day-to-day supervision of the artist's work by the planner. In this way, the planner monitors the product and can make adjustments as needed to bring the graphics into conformity with his or her objectives. Naturally, the planner must know what he or she is seeking in some detail.

With another approach, which has been described as iterative, the planner describes both the desired impact and specific requirements regarding the graphics. The graphic designer then works on the project both meeting the specific requests and using initiative in other technical areas to

achieve the necessary effects. The graphic artist produces a

draft concept which the planner reviews in light of the

planning criteria which have not been communicated to the

artist. A variation of this method, which is applicable to the

work of several of the graphic specialists interviewed, occurs

when a planner chooses a particular specialist because the

specific graphic medium in which the specialist works is

considered appropriate for the planning objectives.

The other end of the spectrum is represented by the

planners who consult with the graphics artists about the

graphics which are to be produced. In some cases, this

consultation occurs at the initial stage of the planning

process, and, consequently, influences such important decisions

as research and recording methods.

In those cases where the planners and the graphic

designers were employees of the same organization, the graphics

people are considered as a separate and subordinate group. The

graphic artists may be consulted at various stages in the

planning process but they are rarely viewed as members of the

planning team. As an example of the variety of opinions on

the question of departmental structure, the views expressed

by people in the Vancouver Planning Department regarding the

present form of the Graphics Section are of interest. One

planner preferred to keep the Graphics group separate but hoped

to borrow Graphics people to work on special projects with

members of his division from time to tome. Another planner

felt that the Graphics group should be split up and one artist
assigned to each division and site office. On the other hand,
the head of the Graphics Section desired further centralization:
the establishment of a Graphics Department to be used by all
the divisions in City Hall.

Graphics are both time consuming and expensive. It
is, therefore, startling to note that none of the planning
organizations had attempted to evaluate the effectiveness of
their graphic work. Most of the graphic specialists who are
hired to produce specific types of work such as newsletters,
topographic models, or public "design-ins" estimate that their
expenses regularly represent less than 1% of a total planning
budget. Graphics done within planning organizations by graphic
specialists were estimated to represent between 5% and 25% of
the organizational budget with the most frequent estimate
being around 10%. When the time spent by planners to do informal
graphics was included in these estimates, the percentages were
naturally higher, in the range of 20 and 25%.

An analysis of the backgrounds of the people inter-
viewed indicated that only the professional planners had
studied planning formally. However, not all of the practicing
planning professionals had planning degrees. Naturally, most
people stated that they learn about planning through their
work since they all work in the planning field. Nevertheless,
two graphic specialists expressed no interest in learning
about planning as a discipline although they work for or with
planners. Among the formally educated planners, few had learned

about the use of graphics in the course of their planning
studies. Several planners had, however, studied graphics or
related subjects like drawing and painting while at university,
primarily as undergraduates. The amount of formal graphics
training varied considerably among the graphics people as well,
from no formal training to in depth study of commercial art.
Several graphic artists had architectural backgrounds. Every-
one felt that they had some informal, working experience with
graphics, although the quality and quantity varied widely.

In general, the graphic artists felt that knowing
planning concepts was helpful but not essential to their
effectiveness. They were, however, intent on learning more
about graphics, especially within their areas of expertise.
They usually concentrated on technique as opposed to general
theoretical considerations. Only a few of the artists felt
that they used any theoretical notions such as the properties
of colours or the constraints of perceptual psychology. While
most of the planners believe that they should know about graphic
production processes, only about half were interested in doing
graphics themselves. The majority had no knowledge of graphic
theory, even among those who do produce fairly formal graphics
on a regular basis.

The areas mentioned by the planning professionals as
important for planning students to learn are concentrated in
the production and technique areas. They suggest a basic know-
ledge of printing processes. The uses and limitations of
various media and their respective costs both in time and money
are the most often discussed topics. Other subjects included
lettering, sketching, interpretation of architectural drawings

and report layout methods. None of the planners recommended study in the theoretical areas of graphics.

The planners and graphics people use a wide variety of graphic methods and media in their work both in informal situations with the professional group and in more formal communications with clients and the public. There is, however, considerable disagreement regarding the effectiveness of various media and their appropriateness to different audiences. The uncertainty revealed regarding the choice of graphic methods is also seen in the various ad hoc approaches which have been devised for planners to achieve their rather uncertain goals when they must rely on graphic artists. These various and un-systematic methods have never been subjected to a structured evaluation although large percentages of departmental budgets are spent on graphic work. Furthermore, the graphic artists rarely study planning either theoretically or on a project basis to improve their contribution, while both the planners and the graphic artists are generally uninterested in theoretical literature which might suggest improvements in the value that planning graphics have for communicating planning objectives to their intended audiences.

In spite of the apparent indifference of the planning profession to theoretical literature regarding graphics, there exists a body of theoretical material which is primarily concerned with the role that graphic, as opposed to verbal, expression plays in thinking and understanding. In the follow-ing two chapters, graphics are considered as a "language" with

its own "grammar" which is the appropriate way to communicate certain types of information.

CHAPTER 3:   REVIEW OF THE LITERATURE ON VISUAL LANGUAGE

The theoretical literature which seems applicable to
the use of graphics in planning can be thought of in two groups:
the literature which makes a case for the value of graphics as
a problem-solving or essential communication "language" and
the literature which deals with detailed aspects of the language
which can be termed as "grammar". The "grammar" of the visual
language will be discussed in the next chapter following the
exposition of the general theoretical background for the
"language" concept.

Kenneth Boulding, in his book The Image, develops his
thesis that all thought processes involve modifications of the
individual's "image" of the world. He prefers not to use the
word "knowledge" since "knowledge"has an implication of
validity, of truth".[1] He is talking about beliefs or "subject-
ive knowledge".[2] An individual's "behaviour depends on the
image".[3] "The image is built up as a result of all past
experience of the possessor of the image. Part of the image
is the history of the image itself."[4] For each person, "every
time a message reaches him his image is likely to be changed
in some degree by it, and as his image is changed his behaviour
patterns will be changed likewise. The messages consist of
information in the sense that they are structured experiences.
The meaning of a message is the change which it produces in the
image."[5] Most messages leave the image unaltered because they
do not conflict with the image. Events which do not fit with
the image call for a change which may be just an addition of
new information or may be a restructuring of the image.

The existence of this personal image has important consequences on the learning process. A "message which comes through the senses is itself mediated through a value system. We do not perceive our sense data raw; they are mediated through a highly learned process of interpretation and acceptance".[6] He concludes that

> "what this means is that for any individual organism or organization, there are no such things as 'facts'. There are only messages filtered through a changeable value system ....This does not mean, however, that the image of the world possessed by an individual is a purely private matter or that all know-ledge is simply subjective knowledge....Part of our image of the world is the belief that this image is shared by other people like ourselves who also are part of our image of the world. In common daily intercourse we all behave as if we possess roughly the same image of the world".[7]

While the images of the individuals who comprise the public exhibit significant overlaps, they are nonetheless predicated on well-established value systems based on the individuals' past experiences. To achieve public consensus or a decision regarding the future, the public image must be understood. However, it must also be altered if only to accommodate new information. The public image is constantly changing. "The image not only makes society, society continually remakes the image. The basic bond of any society, culture, subculture, or organization is a 'public image'....an enormous part of the activity of each society is concerned with the transmission and protection of its public image."[8] New ideas must alter the

current public image which society is involving in promoting.

"Every public image begins in the mind of some single individual

and only becomes public as it is transmitted and shared."[9] New

ideas must be communicated to others effectively if they are to

become incorporated into the constantly evolving public image.

ɔ   Boulding regards politics "as a process of mutual

modification of images through the processes of feedback and

communication".[10] He feels that his theory puts him at odds

with the conventional view of the democratic process. He sees

"the nature of the political process" as "not that of the sum-

mation of fixed individual preferences" but as "the process of

the mutual modification of images both relational and evaluational

in the course of mutual communication, discussion, and discourse".[11]

One of the methods used in this communication process is a

"transcript" which is "a record in more or less permanent form"

of a public image.[12]

> "An effective transcript has a great effect
> in creating a public image, that is, in
> ensuring that the images of the various
> individuals who have access to the trans-
> cript are identical or nearly so."[13]

Historically, much of this transcript has been in written form.

Recently, the "camera, the movie, the phonograph, and the tape

recorder" have permitted direct recording for the transcript.

Graphics also are needed for transcripts. Specifically, there

are still large parts of the image, however, which can only be

transcribed in symbolic form."[14] As an example, he mentions

maps: The "spatial image can be transcribed very briefly and

commodiously in the form of a map. The map itself....has a

profound effect on our spatial image."[15] Graphics are complex

records. Hence, "even the map, which is apparently the most 'factual' of all transcripts, may have strong elements involving other parts of the image."[16]

Boulding discusses symbolic images in some detail. These are often expressed through graphics.

> "Symbolic images are particularly important
> in the summation and presentation of value
> images....They consist....of a 'posture'
> which in a sense summarizes an extremely
> complex network of alternatives and
> situations."17

The ability for symbolic images, and visual images in general, to summarize complex ideas is, according to Boulding an essential role in the thinking process.

> "The symbolic image is absolutely necessary as
> a part of the economy of image-formation. The
> human imagination can only bear a certain
> degree of complexity. When the complexity
> becomes intolerable, it retreats into symbolic
> images."18

This argument of the essential role that visual images play in the process of thinking about complex material suggests that graphic images, as a concrete manifestation of visual images, can be used to further the consideration and modification of the public image of complex issues. Graphics offer what Boulding terms an economic way to handle complex issues. And "my economizing of learning....is highly desirable".[19]

Another theorist, George Gerbner, expresses views on communication through various media which coincide to an extent with those of Boulding. He defines "communication" as "the exchange by means of the symbolic environment".[20] "Culture itself can be regarded broadly as a system in which messages

cultivate and regulate the relations between people."[21] "By

messages" he means "formally coded symbolic or representational

patterns of some shared significance in a culture."[22] Graphic

media are a major part of these representational patterns. He

states that

> "the most profound effects of communication
> can be found not in making sales, getting
> votes, influencing opinions and changing
> attitudes but in the selective maintenance
> of relatively stable structures of images
> and associations that stem from institutional
> structures and policies and that define the
> common perspectives of a society."[23]

This formulation is much in the same view as Boulding's

concept of a public image which remains relatively stable due

to the transcript of society as it is partially expressed

through the communications media including graphics. He also

concurs and elaborates on the subject of the complex messages

in graphic as well as other communication media:

> "One always communicates more things - or
> other things - than one is aware of. In-
> deed, there are no failures of communication,
> only failures of intention and of under-
> standing what the message was in the first
> place."[24]

In the case of graphics, among other modes of communication,

the "symbolic functions are the consequences that flow....re-

gardless of intentions and pretentions."[25] He recommends

analysis to "obtain information about what the actual messages,

rather than the presumed messages, might be."[26] Those messages

which remain unrecognized may work to defeat the intended

function of the graphics.

Rudolf Arnheim puts forward his theory "that pro-
ductive thinking in any area of cognition is perceptual
thinking"[27] primarily in a book entitled Visual Thinking.
He starts from his background in fine arts which had indicated
to him "that artistic activity is a form of reasoning, in
which perceiving and thinking are indivisibly intertwined."[28]
He bases much of his theory on his study of psychological theories.

> "A review of what is known about perception"
> led him to realize "that the remarkable
> mechanisms by which the senses understand
> the environment are all but identical with
> the operations described by the psychology
> of thinking. Inversely, there was much
> evidence that truly productive thinking in
> whatever area of cognition takes place in
> the realm of imagery."[29]

He believes that modern man mistrusts the senses. Nevertheless,
he describes in detail what he terms the "intelligence" of
perception. He demonstrates that visual perception requires
"an active concern of the mind" in which "the sense of sight
operates selectively" using "visual concepts."[30] He describes
this process as involving "problem solving".[31] He demonstrates
that abstraction, a complex cognitive function, is essential
to successful perception. He uses the process of analysis
of visual data by computers as an analogy to demonstrate the
complexity of the human abstraction process. He concludes
that an individual's visual concepts may be used to find
analogies which focus on essential principles whereas the
computer cannot break down images in this way.[32] If productive
thinking does indeed depend on visual perception, then visual

awareness should be valued highly as a tool for problem solving.
Arnheim winds up his book with the conclusion that his theory
implies a need for "systematic training of visual sensitivity".[33]
Specifically, he believes that the

> "difference between a picture that makes its point
> and one that does not can be discerned by anybody
> whose natural responses to perceptual form have
> been cultivated rather than stifled."[34]

In another context, he suggests that, not only does the content
of a graphic display reveal itself to the perceptually aware
person, but that the form a message takes cannot be successfully
dissociated from the content.[35] Taking this conclusion a step
further suggests that the choice of an appropriate form for a
graphic product necessitates an understanding of the content.
It would then seem that both the choice of media and the
details of the design should be dictated to some extent by the
subject matter.

Arnheim develops a theory about how images evolve
through time which, although it is both more complicated and
less comprehensive than Boulding's, does not really contradict
his view. For Arnheim, the mind contains

> "a storehouse of visual concepts, some clear-
> cut and simple, some elusive and intangible
> ....The images of some things are rigidly
> stereotyped, others rich in variation, and
> of some we may possess several images un-
> willing to fuse into one unitary conception
> ....All sorts of connection tie these images
> together. Although the total content of a
> person's memory can hardly be called an
> integrated whole, it contains organized clusters
> of small or large range, families of concepts
> bound together by similarity, associations of
> all kinds....Innumerable thought operations
> have formed these patterns....and continue to
> form them."[36]

Arnheim is primarily concerned with the role of specific images
and the problem solving processes for particular situations.
Hence, he focuses on the variations between images while
Boulding concentrates on the similarities. Nevertheless, both
can be said to agree on a primacy of visual images which are
the basis for actions and which are constantly undergoing
modification through learning.

Arnheim distinguishes three functions of images:
They "can serve as pictures or as symbols; they can also be used
as signs."[37]   He points out that

> "the three terms — picture, symbol, sign —
> do not stand for kinds of images. They
> rather describe three functions....A
> particular image may be used for each of
> these functions and will often serve
> more than one at the same time. As a
> rule, the image itself does not tell
> which function is intended."[38]

"An image serves merely as a _sign_ to the extent to which it
stands for a particular content without reflecting its
characteristics visually."[39]   "They operate as mere references
to the things for which they stand. They are not analogues,
and therefore they cannot be used as media for thought in their
own right."[40]   Numerals and letters are given as examples of signs.

> "Images are _pictures_ to the extent to which
> they portray things located at lower level of
> abstractness than they are themselves. They
> do their work by grasping and rendering some
> relevant qualities — shape, color, movement
> — of the objects or activities they depict.
> Pictures cannot be mere replicas....Abstract-
> ness is a means by which the picture inter-
> prets what is portrays."[41]

"In other words, the pictorial interpretation emphasizes the
generic qualities with which all thinking is concerned."[42]

Finally, "an image acts as a symbol to the extent to which it portrays things which are at a higher level of abstractness than the symbol itself. A symbol gives particular shape to types of things or constellations of forces."[43] Arnheim's three functions were established to differentiate among levels of usefulness for thinking purposes. However, his categories also have value for considering graphic methods, especially those techniques which are used for generating ideas. In this context, "signs" are useful to the degree which a group agrees to their meaning. "Pictures" should be created at the level of abstractness necessary for them to fulfill their "generic" function which is limited to "salient features".[44] Pictures used as working tools and aids to thinking need to include the essential aspects of the problem but should not waste effort by being overly detailed or concrete. "Symbols" are a key to making very abstract ideas manageable. This view corresponds with Boulding's notion that symbolic visual images summarize complex situations. They also are only successful if they represent a shared group image.

Yet another theorist who makes a strong case for the importance of visual images to the thinking and problem-solving functions is James L. Adams, author of Conceptual Blockbusting: A Guide to Better Ideas. He is a professor of engineering design who teaches problem-solving techniques to his students. He believes that there exist a variety of problem-solving strategies which people can learn and practice. These tactics are more appropriate for some problems than others. So an

individual must not only be aware of these strategies but must

also be able to choose an appropriate approach to each particular

problem. He further identifies a number of "blocks" which

operate to limit people's ability to use various thinking

strategies effectively. One of the strategies is "visual think-

ing".[45] He states that

> "visualization is an important thinking mode
> which is especially useful in solving
> problems where shapes, forms or patterns
> are concerned."[46]

He quotes his colleague, Bob McKim, who theorized that there

are "Three kinds of visual imagery that are
necessary in effective visual thinking.
The first, perceptual imagery, is
sensory experience of the physical world;
it is what one sees and records in his
brain. The second is mental imagery,
which is constructed in the mind and uti-
lizes information recorded from perceptual
imagery. The third type is graphic imagery.
This is imagery which is sketched, doodled,
drawn, or otherwise put down in a written
communicable form, either to aid in one's
own process of thinking or to aid in com-
munications with others."[47]

These divisions seem to be valuable. All involve thinking.

However, only graphic imagery permits communication to others.

This communications role is the key one for graphics. Never-

theless, in order to use graphic images effectively, one must

also master perceptual and mental imagery. Adams agrees with

Arnheim that perception must be trained to promote improved

thinking. As Adams puts it: "you can learn to see better

through conscious effort, especially if you are convinced that

seeing better is important to you."[48] In his view, "visual

imaging ability is complex, since it depends not only upon

one's ability to form images, but also upon the supply of
pertinent imagery stored in the mind."[49] Naturally, the more
effort devoted to images, the more visual thinking will be
improved.

Looking at graphic imagery in more detail, Adams
concludes that

> "in order to take full advantage of visual thinking
> ability, drawing is necessary. Drawing allows the
> recording, storage, manipulation, and communication
> of images to augment the pictures one can generate
> in his imagination."[50]

He finds that is is "useful to divide drawing into two categories:
that which is done to communicate with others, and that which
is done to communicate with oneself."[51] The first type of draw-
ing (communicative) receives a good bit of attention educa-
tionally, and one can learn to make such drawings through
formal courses of instruction. The second type (thinking
sketches) receives far less emphasis, yet it is an important
adjunct to visual thinking.[52] He recommends that attention be
given to thinking sketches since he believes that "visualization
....is one of the most basic of all thinking modes and one which
is invaluable in problem-solving."[53] Although Adams quotes
Arnheim in support of his views of visual thinking, he does not
place the importance on visual thinking that Arnheim does. For
Adams, it is one tool which is suited for solving certain types
of problems. It makes little difference, however, whether
visual thinking underlies all or only a portion of cognitive
processes. It is enough that visual thinking is valuable in
dealing with some types of problems.

Adams discusses "intellectual blocks" which "result in an inefficient choice of mental tactics or a shortage of intellectual ammunition".[54] A "block" may involve "solving the problem using an incorrect language (verbal, mathematical visual) - as in trying to solve a problem mathematically when it can more easily be accomplished visually".[55] He believes that the choice of a "language" is usually made unconsciously and that "most people follow (a) habit pattern in problem-solving".[56] However, "it is possible to aid this strategy selection by consciously considering the various languages of thought."[57] He believes that the

> "choice of the proper problem-solving language
> is difficult not only because the choice is
> usually made unconsciously, but also because of
> the heavy emphasis on verbal thinking (with
> mathematical thinking a poor second) in our
> culture".58

To help in making these choices, Adams' three categories of thinking are of use. His

> "three distinct types of thinking" are "analysis,
> judgement, and synthesis....In analysis, there
> is usually a right answer....Judgement is gen-
> erally used in a problem where there are
> several answers and one must be chosen....
> Synthesis is even more of a multi-answer
> situation....and there are few rigorous
> techniques to help in deciding between them."59

Most complex situations could be said to require synthesis. Opportunities to come up with one right answer which everyone will recognize are rare. The development of alternatives may ultimately require judgement and choice, but this should follow a synthetic phase which produces many ideas using all the possibly appropriate cognitive languages.

Adams' belief that people's thought processes are overly
dominated by the verbal thinking mode is also essential to the
work of Marshall McLuhan. McLuhan contrasts modern man with
people who have not been brought up in a literate society. He
believes that "literacy creates very much simpler kinds of
people than those that develop in the complex web of ordinary
tribal and oral societies".[60] This simplicity is derived from
the linear nature of verbal culture: "the written word spells
out in sequence what is quick and implicit in the spoken word".[61]
The "Gutenberg technology" has led to "an age of fragmented,
lineal awareness".[62] Furthermore, a "habit of specialism....
quite naturally derives from typographic culture".[63] This
specialization was particularly evident in the sciences who
have "been, from their origins, utterly handicapped by the
lack of adequate nonverbal means of transmitting information".[64]

This domination by the written word is ending, accord-
ing to McLuhan. "The step from the age of Typographic Man to
the age of Graphic Man was taken with the invention of
photography".[65] The recent media provide a new freedom from
linear thinking. "The instant speed of electricity,"[66] which
he considers the basis of "the electric age",[67] now permits
"the instant vision of a complex process that ordinarily extends
over a long period".[68] "The mode of simultaneous awareness of
a complex group of causes and effects....in an age of...lineal
awareness....remains quite opaque".[69] The ability to think
about complex situations is difficult in a verbal medium. If
McLuhan's arguments seem persuasive, then problem solvers

should try to work in media suited to the task. The con-
sequences of the verbal orientation of our society are deep.
"The effects of technology do not occur at the level of opinins
or concepts, but alter sense ratios or patterns of perception
steadily."[70] An imbalanced dependence on the written word for
communication purposes, therefore, not only limits ideas, it
limits the image of the world in its true complexity. If "all
media are active metaphors in their power to translate ex-
perience into new forms",[71] then various media should be used
for their ability to make more of the complexity of the world
available to understanding.

Another important theorist on the subject of the visual
image is E.H. Gombrich. He is particularly concerned with the
degrees to which visual images are representations of reality.
He deals with the functions of verbal statements in contrast
to those of graphic expressions. He asserts that

> "the visual image is supreme in its capacity for
> arousal, that its use for expressive purposes
> is problematic, and that unaided it altogether
> lacks the possibility of matching the statement
> function of language".72

In other words, "statements cannot be translated into images."[73]
This contention fits well with Adams' view that certain cognitive
languages are more appropriate for specific tasks than others.
For Gombrich, "the real value of the image....is its capacity
to convey information that cannot be coded in any other way".[74]
He describes a "range" of "information value" for "images"
based on "the amount of information about the prototype that
they uncode".[75] First, "where the information is virtually

complete we speak of a facsimile or replica."[76] A replica
"would not be classed as an image if it shared with its proto-
type all characteristics,"[77] therefore "however faithful an
image....may be, the process of selection will always reveal
the maker's interpretation of what he considers relevant."[78]
This contention would imply that even realistic images are
modified by the graphic artists' objectives. On the other
hand, "interpretation on the part of the image maker must al-
ways be matched by the interpretation of the viewer."[79] This
implies that a knowledge of the intended audience is essential
to effective graphics. He calls "the contribution we make to
any representations from the stock of images in our mind" the
"beholder's share".[80] Past experience plays a major role in
understanding graphic images. For example, it has been
demonstrated that "interpreting photographs is an important
skill that must be learned."[81] Second, he identifies images
with "selective representation".[82] Such images involve "a
code" which "enables the maker of the image to filter out
certain kinds of information and to uncode only those features
that are of interest to the recipient."[83] And "a selective
representation that indicates its own principles of selection
will be more informative than the replica."[84] The next category
in his range is "diagrammatic mapping."[85] The important
"characteristic of the map is the addition of a key to the
standardized code."[86] Then, "it is only a small step from the
abstraction of the map to a chart or diagram showing relations
that are originally not visual but temporal or logical."[87]
Finally, there is "a large group of graphic symbols that occupy

the zone between the visual image and the written sign."[88]
Naturally, the informational content of symbols must be learned
and agreed on. In the production of graphics, it would be well
to choose the medium and style of the presentation with
Gombrich's range in mind, especially if he is correct in saying
that condensation and selection in images have the ability to
arrest people's attention, convey additional information and
arouse their interest.[89]

Perhaps the most interesting points in Gombrich's
theory deal with the interaction between images and words.
Basically he finds that "jointly the media of word and image
increase the probability of a correct reconstruction".[90]
"This mutual support of language and image" has an experimental
basis.[91] He, therefore, believes that "the use of two in-
dependent channels....guarantees the ease of reconstruction".[92]
Without the support of words, interpretation of an image relies
heavily on the context. However, it must be remembered that
"in such usages context must be supported by prior expectations
based on tradition".[93] Even if the experiences of the in-
tended audience are respected by the maker of the image, "The
information extracted from an image can be quite independent
of the intention of its maker."[94] This depends on the needs
and purposes of the viewer.

Gombrich's ideas regarding the information value of
images are supported by considerable research. The implications

for graphics are several. For one, graphics should be integrated
with text whenever possible. Images should be reinforced by
words when possible. It, therefore, would seem logical that
the graphic artist should understand the text and that the author
of the the text should understand the support offered by the
image. Also, the graphic artist must try to prepare images at
the appropriate level of selective representation to achieve
maximum impact and interest arousal. This selectivity requires
that the person responsible for conceiving the graphic image
be aware of two factors. One factor is the objectives for the
graphic which represent the selection criteria which permits
the filtering out of extraneous features. The other factor is
the nature of the intended audience for the graphics which
dictates the degree of symbolism and coding which can be
utilized.

In summary, the theorists mentioned agree on a number
of points regarding the value of graphic "language". For one,
Boulding discussed the role of graphic symbolism in aiding
people to think about complex ideas. Gerbner and Adams also
stress this notion that graphic messages are needed to communi-
cate complexity. McLuhan feels that the linear thinking which
was characteristic of the "Typographic" man created by the
printing press has frustrated the ability to deal with
simultaneous and complex ideas and that the new media which
has produced "Graphic" man now permits communication of
complexity.

Another major topic is the role played by visual images in the cognitive process. Boulding stresses that all knowledge is comprised of images which are constantly subject to modification by perceptions of the world and communications from other people. The images which people share create the public image. The political process involves a mutual effort to alter the public image to be closer to individual images. Gerbner also discusses visual images as messages which are exchanged to promote a common perspective. Arnheim takes perhaps the most extreme stand on the role of visual images in thinking. He believes that all productive thinking is based on perception and that visual images are essential for problem-solving. Adams is more moderate. He claims that visual think-ing is one of several important cognitive languages which serve as problem-solving strategies. Nevertheless, visual thinking is the key to the solution of certain types of problems. Those who seek to be problem-solvers should be capable of applying visual images in those situations in which they are required. This conclusion can be maintained whether one agrees with Arnheim or Boulding on the primacy of the visual image or with Adams on the applicability of visual images to certain types of problem situations.

Thirdly, a number of these theorists emphasize that past experience affects visual perception. In the case of Boulding, people's images of the world are derived from past experiences. Their shared public image is recorded in symbolic form by society's "transcript". The value of graphic messages

is their ability to change images established in the past and, therefore, change behaviour in the present. Gombrich discusses past experience in terms of its effect on the ability to understand graphic images, especially those which involve "selective representation". Arnheim and Adams both stress that, to use visual images to solve problems successfully, one needs to have past experience thinking in a visual mode. They agree that this visual acuity needed for visual thinking can be taught. The converse is also true: it can be neglected. The implications are several. Problem solvers should be trained in the use of images. They should also understand public images, particularly those shared by their intended audience. This understanding will permit them to use graphics at effective levels of abstraction and information content. It may also help them to analyze graphic messages to see more of the impacts they have on their viewers, as Gernber suggests.

Finally, several of the theorists have formulated categories which they find useful in discussing graphic images. Arnheim speaks of pictures, symbols, and signs as three functions which an image can serve depending on the intention of the graphic artist. A "picture" portrays things at a low level of abstraction. This concept is similar to Gombrich's "replica" and to McKim's "perceptual imagery". A "symbol" portrays things at a high level of abstraction. Gombrich uses the term "selective representation" for graphic images that employ abstraction to make their point more efficiently and effectively. Adams describes "mental imagery" as being useful for problem-

solving in that it focuses selectively on the relevant features of a less abstract, perceptual image. Boulding also talks at length about the "symbolic" function of some images which permit them to summarize and condense complex information into a manageable form. For Arnheim, a "sign" refers to an idea without portraying it. Consequently, it must be agreed on by the image maker and the expected audience. Gombrich also emphasizes the role of past training in permitting certain of what he terms "graphic symbols" to serve their function "between the visual image and the written sign".[95] While the choice of terminology can be considered a matter of preference, the underlying concept of graphic images and their functions should be understood by those involved in the preparation of graphics in order to provide criteria for the choice among various graphic techniques.

The following chapter deals with the literature on specific graphic techniques. These may be considered the "grammar" for the language of visual thinking which has been described in this chapter. The techniques discussed cover those mentioned in the interviews as well as additional concepts which are generally of a more theoretical nature.

CHAPTER 3 - FOOTNOTES

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   Press. Ann Arbor, 1956. p. 5.

2 Ibid. p. 6.

3 Ibid. p. 6.

4 Ibid. p. 6.

5 Ibid. p. 5.

6 Ibid. p. 14.

7 Ibid. p. 14.

8 Ibid. p. 64.

9 Ibid. p. 64.

10 Ibid. p. 102.

11 Ibid. p. 102 - 103.

12 Ibid. p. 64.

13 Ibid. p. 65.

14 Ibid. p. 65.

15 Ibid. p. 65.

16 Ibid. p. 67.

17 Ibid. p. 110.

18 Ibid. p. 111.

19 Ibid. p. 163.

20 George Gerbner. "Communication and Social Environment".
   Scientific American. Vol. 227. Sept. 1972. p. 153.

21 Ibid. p. 154.

22 Ibid. p. 153 - 154.

23 Ibid. p. 158.

24 Ibid. p. 158.

25 Ibid. p. 158.

26 Ibid. p. 158.

27 Rudolf Arnheim. Visual Thinking. University of California
    Press. Berkeley, 1969. p. 296.

28 Ibid. p. 296.

29 Ibid. p. 296.

30 Ibid. p. 37.

31 Ibid. p. 37.

32 Ibid. p. 313.

33 Ibid. p. 315.

34 Ibid. p. 315.

35 Rudolf Arnheim. Toward a Psychology of Art. University of
    California Press. Berkeley, 1966. p. 16.

36 Arnheim. Visual Thinking. op. cit. p. 84.

37 Ibid. p. 135.

38 Ibid. p. 136.

39 Ibid. p. 136.

40 Ibid. p. 137.

41 Ibid. p. 137.

42 Ibid. p. 138.

43 Ibid. p. 138.

44 Ibid. p. 105.

45 James L. Adams. Conceptual Blockbusting: A Guide to Better
    Ideas. W.H. Freeman and Co. San Francisco, 1974. p. 98.

46 Ibid. p. 98.

47 Ibid. p. 99.

48 Ibid. p. 99.

49 Ibid. p. 101.

50 Ibid. p. 102.

51 Ibid. p. 102.

52 Ibid. p. 103.

53 Ibid. p. 105.

54 Ibid. p. 63.

55 Ibid. p. 63.

56 Ibid. p. 64.

57 Ibid. p. 64.

58 Ibid. p. 65.

59 Ibid. p. 56.

60 Marshall McLuhan. Understanding Media: The Extensions of Man. Signet Books. Toronto, 1966. p. 59.

61 Ibid. p. 82.

62 McLuhan. The Gutenberg Galaxy. Mentor Books. New York, 1969. p. 315.

63 McLuhan. Understand Media: The Extensions of Man. op. cit. p. 163.

64 Ibid. p. 173.

65 Ibid. p. 171.

66 Ibid. p. 39.

67 Ibid. p. 38.

68 Ibid. p. 38.

69 McLuhan. The Gutenberg Galaxy. op. cit. p. 315.

70 McLuhan. Understanding Media: The Extensions of Man. op. cit. p. 33.

71 Ibid. p. 64.

72 E.H. Gombrich. "The Visual Image" Scientific American. Vol. 227. Sept. 1972. p. 82.

73 Ibid. p. 82.

74 Ibid. p. 87.

75 Ibid. p. 88.

76 Ibid. p. 88.

77 Ibid. p. 88.

78   Ibid. p. 88.

79   Ibid. p. 88.

80   Ibid. p. 89.

81   Ibid. p. 89.

82   Ibid. p. 91.

83   Ibid. p. 91.

84   Ibid. p. 91.

85   Ibid. p. 91.

86   Ibid. p. 91.

87   Ibid. p. 91.

88   Ibid. p. 92.

89   Ibid. p. 94.

90   Ibid. p. 86.

91   Ibid. p. 86.

92   Ibid. p. 86.

93   Ibid. p. 87.

94   Ibid. p. 87.

95   Ibid. p. 92

CHAPTER 4:   THE GRAMMAR OF VISUAL LANGUAGE

If the theories of visual "language" presented in the previous chapter are convincing, then it seems reasonable to seek the elements of that "language" or its grammar.   As S.I. Hayakawa expresses it:

> "The language of vision determines, perhaps even more subtly and thoroughly than verbal language the structure of our consciousness.   To see in limited modes of vision is not to at all - to be bounded by the narrowest parochialisms of feeling."1

He commends Gyorgy Kepes for "his attempt at visual re-education....to compel us to take into consideration the 'refraction of our inherited modes of vision....by showing us what goes into visual experience."2   He describes this as

> "the 'grammar' and the 'syntax' of vision: what interplays of what forces in the human nervous system, and in the world outside, it produces, what visual tensions and resolutions of tensions; what confirmations of visual elements result in what new organizations of feeling; what 'visual statements' apart from 'literary' or representational content, can be made with line, colour, form, texture, and arrangement."3

For planning graphics, the implication of Hayakawa's statement is that, given the "grammar" of visual language of which he writes, a graphic design communicates on many levels, not only on the rational, representational level.   An under-standing of the visual grammar, aspects of which will be dis-cussed in this chapter, would then permit graphic artists working for planners to prepare their products to have a more effective impact.

Naturally, the contention that graphics can communicate on different levels at the same time raises questions about the ethical implications of manipulating the components of a graphic image to obtain a desired effect. These questions have been at the core of the criticisms of advertising techniques for a long time. John Cataldo, writing on this subject, claims that:

> "Since all communication - verbal and nonverbal - has the capacity to manipulate, persuade, transform, and educate the public, it follows that graphic design is a social art and by this definition must assume the moral and ethical responsibilities of public service."4

Graphic designers working for planning purposes should ideally understand and support the planning objectives they are working to communicate. They would, therefore, avoid one of the ethical dilemmas of the graphics professional, that "graphic designers....are often forced into the position of preparing an elegant graphic mode for an advertiser's product which they know to be of comparatively low merit."5

Cataldo believes that "graphic designers too often fail to recognize certain affective needs of human personality - for example, the role that private opinion, perceptual experience, and emotion play in the public's reaction to communication efforts."6 In his experience with the teaching of graphics, he finds that, in general, design students "are usually well qualified to deal with professional and aesthetic demands of visual communication, yet are unaware of or have chosen to ignore research in the social and perceptual sciences as it affects behavioural response."7

Both Cataldo and Kepes discuss the findings of the Gestalt psychologists in the area of perceptual psychology in terms of their relevance to understanding the impacts of graphic works. The Gestalt theorists studied visual images as integrated, functional units which could not be fully understood through analysis of their composite parts. A number of these Gestalt theories seem particularly relevant to graphic communication: figure/ground, similarity, proximity, continuation, closure, equilibrium and rhythm.

The concept of figure/ground is undoubtedly the best known Gestalt principle. As Arnheim explains it:

> "All contours separate two adjoining areas. In most cases, one of the areas seizes the contour while the other, contourless area is seen as extending underneath the first. This splits the whole pattern into two spatial planes, the first area occupying the nearer plane and becoming the 'figure', the second occupying the farther planes and becoming 'ground'.8

Specifically, "in a figure-ground situation....the brighter component tends to advance and become the figure, and the one placed at the bottom tends to do the same."[9] As Cataldo puts it: "The contrast or opposition resulting from the figure-ground phenomenon is fundamental to all visual experience....To select and perceive objects without distortion is a creative operation."[10] In spite of the essential nature of the figure/ground relationship, very little research has been done on this phenomenon since its original formulation. Arnheim concludes that "there is no reason why the theory of figure and ground should still be in the state in which Edgar Rubin left it in 1915."[11]

FIGURE/GROUND (I)

"Negative as well as positive space can be dynamic."

Alan Flether, Colin Forber, and Bob Gill. Graphic Design:
Visual Comparisons. Studio Books. London, 1963. p. 88.
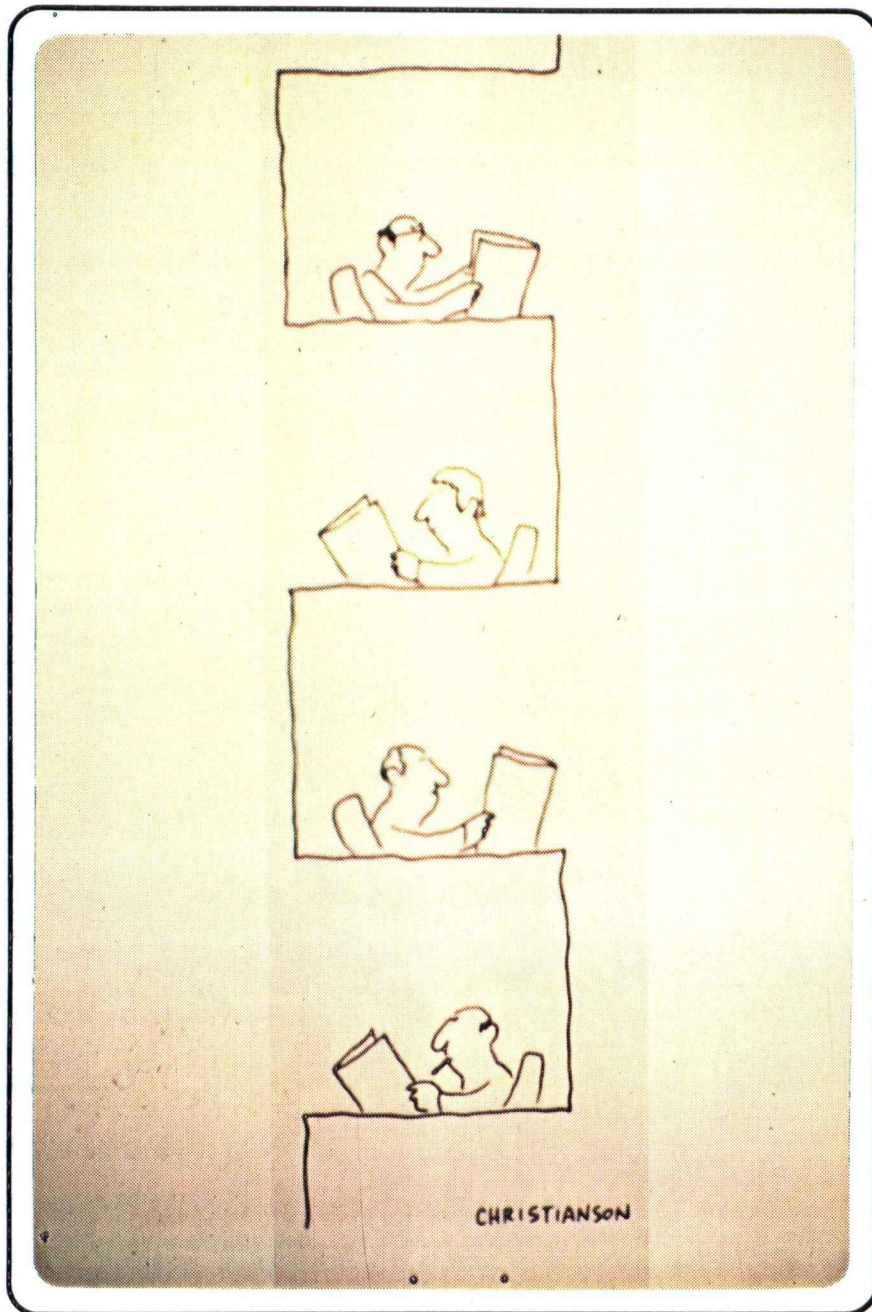
Figure/Ground (II) - Graphic artists can manipulate perceptual principles such as figure/ground to achieve humorous effects.

The New Yorker. June 2, 1975. p.36.

Figure/Ground (III)

M. C. Esher used ambiguous figure and ground relationships as the basis of many of his graphic designs.

The Law of Similarity in perceptual organization is the tendency of like parts to band together.[12] It is termed a "law" since the Gestalt psychologists found that the principle was valid and consistent in all cases. "Visual units which resemble each other in shape, size, colour, and direction will be seen together as a homogeneous grouping."[13] This unifying property of repeated forms and hues makes "Similarity....one way by which greater stability can be reached"[14] in graphics.

The Laws of Similarity and Proximity are closely related, so much so that when the Gestalt theorists first introduced these concepts they "formulated....a similarity-proximity law".[15] Therefore, it seems expedient to discuss them together. The Law of Proximity states that "perceptual groupings are favoured according to the nearness of parts."[16] Or, put in more dynamic terms by Koffka, a noted Gestalt psychologist, "two similar objects in our field of vision will attract each other with a force decreasing with the distance between them."[17] Hence, the Law of Proximity is clearly related to the concept of similarity, since "when two heterogeneous parts form a group because of proximity, there must be some aspect in which they are equal and therefore able to influence each other."[18]

The "role" of proximity in graphics is "as a unifying factor."[19] "In visual perception what is closest together tends to unite."[20] According to Kepes, "the proximity of optical units is the simplest condition for a crystallization of unified visual 'wholes'. We articulate a painting, a typographical design

first of all by the law of proximity. Optical units close to
each other on a picture plane tend to be seen together and,
consequently, one can stabilize them in coherent figures."[21]

Groups unified by the Law of Similarity are perceived
to be more homogeneous than groups interrelated through
proximity.[22] Koffka suggests that similarity of the elements
in the visual field is essential to any perception of proximity.[23]
He further finds that "equality of form (is) a stronger factor
of organization than equality of colour."[24] Furthermore, Kepes
states that

> "Proximity and similarity, as factors in the
> creation of spatial structure, must be
> considered together. For units formed by
> proximity can be broken up through the
> similarity of their elements with other
> elements at a distance, and units formed by
> similarity can be broken up by extreme
> proximity of outside elements. This
> competition is important to the plastic
> organism, for opposite direction of
> organization can bring a vital tension
> into the plastic experience."[25]

Max Wertheimer formulated the Law of Good Continuation
in 1923. This law states basically that "organization will,
ceteris paribus, occur in such a way that a straight line will
continue as a straight line....any curve will proceed in its
own natural way, a circle as a circle, an ellipse as an ellipse,
and so forth."[26] "Every linear unit has kinetic inertia. It
tends to be continued in the same direction and with the same
movement."[27]

The tendency to perceive lines continuing in space can
be used to structure complex graphic images. As Kepes explains:

SIMILARITY (I)

The principle of similarity can be used to organize a graphic
image containing many separate forms. If some of the forms
are similar enough to other forms, this image will be
simplified as they group together visually.
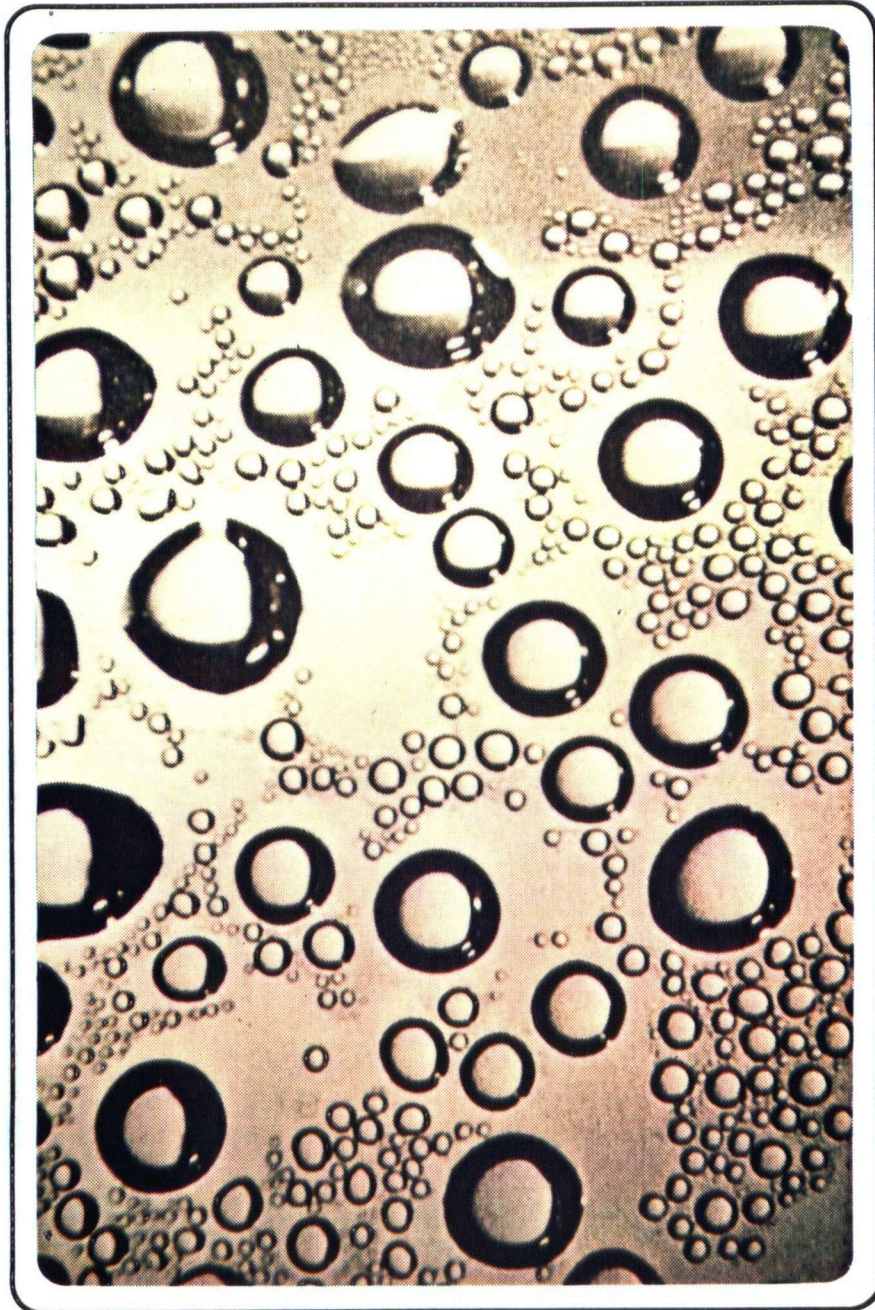
John W. Cataldo. Graphic Design and Visual Communication.
International Textbook Co. Scranton, Penn., 1966. p. 128.

SIMILARITY (II)

Similar forms are perceived as groups even if different
forms intervene. In this case, the two groups of forms es-
tablish a visual tension within the graphic image.
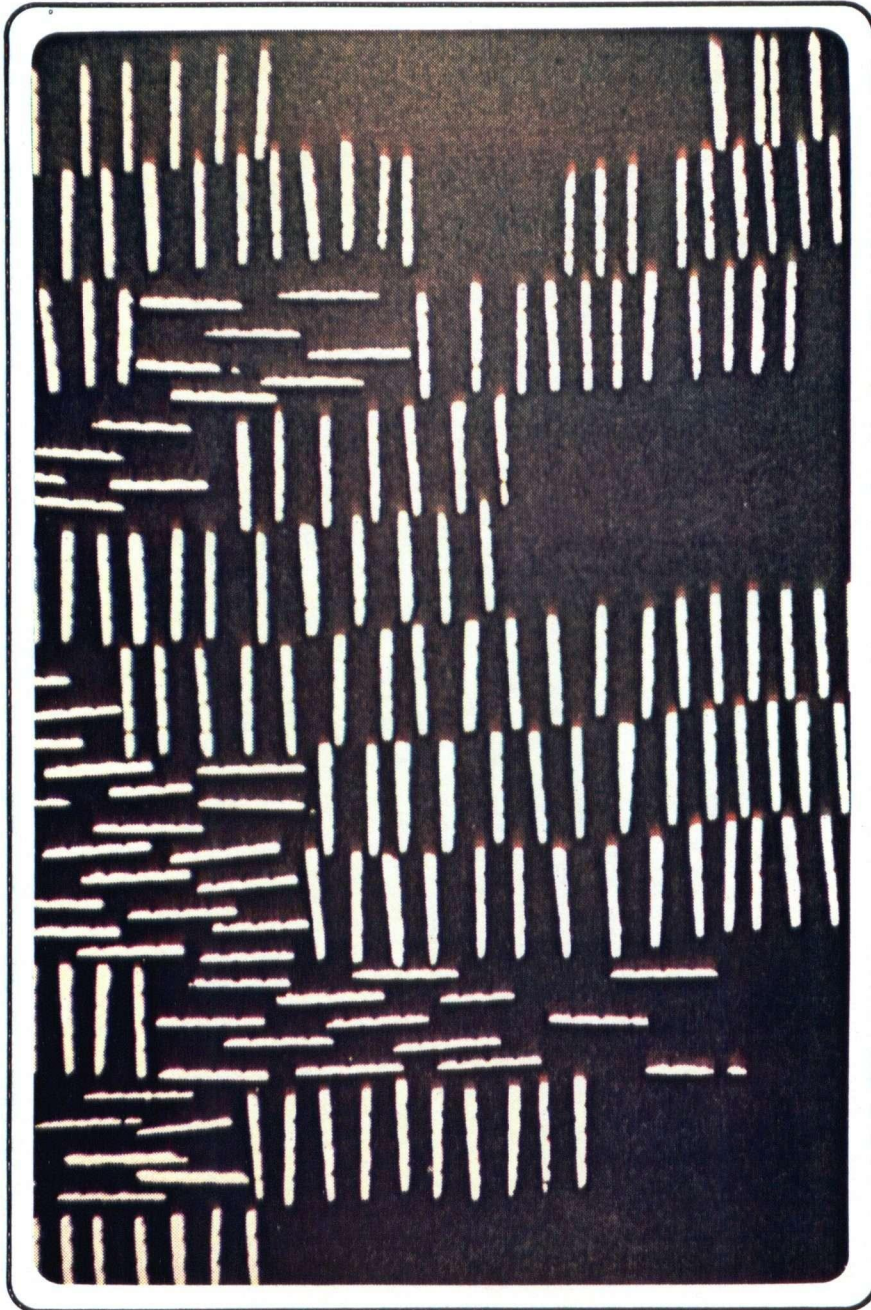
John W. Cataldo. Graphic Design and Visual Communication.
International Textbook Co. Scranton, Pa., 1966. p. 127.

PROXIMITY (I)

Shapes which are near each other are perceived in groups.

(based on John W. Cataldo. Graphic Design and Visual
Communication. International Textbook Co. Scranton, Penn.,
1966. p. 125.)

PROXIMITY (II)

"An illustration taken from K. Koffka can elucidate the law
of proximity. Two parallel lines are perceived as one unit
if they are close enough together. Because the space between
them is enclosed, it appears separated from the surrounding
space. If one adds two more parallels outside of the first
two, the figure that was made by the interval between them
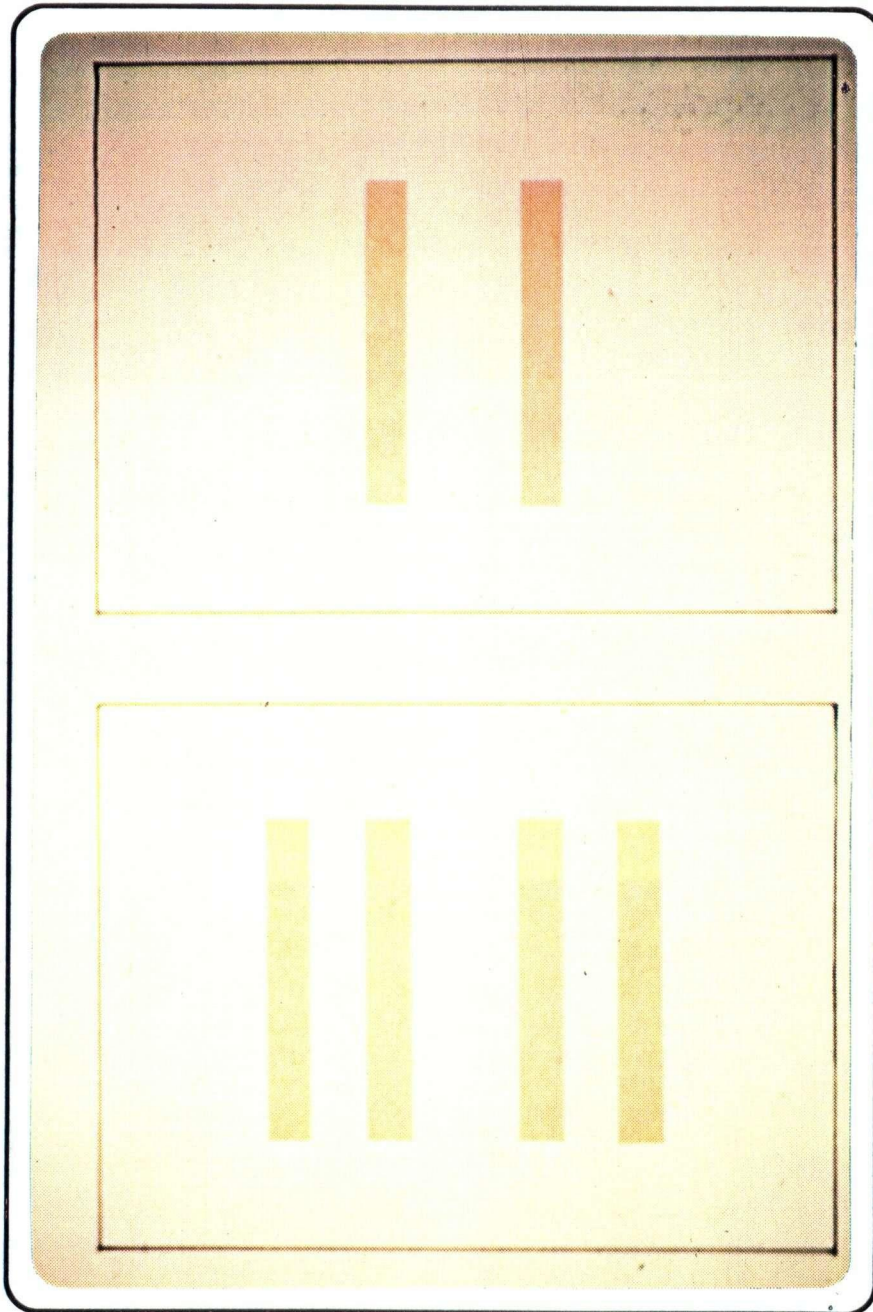
loses its quality as a coherent whole, and serves only as
a background for the two new units."

Gyorgy Kepes. Language of Vision. Paul theobald. Chicago,
1944. p. 46.

spatial organisation is the vital
factor in an optical message

sp atialor gani sationist hevital
fa ctorin an optical message

spatial organisation is the vital
fa ctorin   an optical message

46

PROXIMITY (III)

"We read words as segregated wholes because their letters
are closer to one another than are the last and the first
of two words."

Gyorgy Kepes. Language of Vision. Paul Theobald. Chicago,
1944. p.46.

> "Such linear continuation helps to form the
> image by creating groups of a simple order.
> It is a most potent device in binding to-
> gether heterogeneous elements and thus
> reducing the picture-image to the number of
> units which can be fully comprehended in
> one attentive act."[28]

The Gestalt theorists relate the concept of continu-
ation to areas as well as lines. In the case of areas, they
refer to "good figure"[29] or "good shape"[30].

> "Good continuation and good shape (are)
> powerful organizing factors....a line
> carries its own law within itself, and so
> does a shaped area or volume. Violations
> of this law due to external forces are
> felt as violations; they conflict with
> our feeling of the fit, hurt our sense of
> beauty."[31]

Kepes believes that "The Law of Continuance is also valid for
the gradation or progression of hue, value and chroma. The eye
moves along a direction of hue or value gradation similar to
the way it moves along a line."[32] Even "events have their
own shape, which demands a proper continuation."[33]

The Gestalt Psychologists, primarily Wolfgang Köhler
and Max Wertheimer postulated the Law of Closure as a result
of their experiments in perceptual organization in the 1920's.
They discovered that "closed areas seem to be self-sustaining,
stable organizations"[34] while unclosed ones lack organization.
In perception,

> "forces of organization driving toward
> spatial order, toward stability, tend
> to shape optical units into closed
> compact wholes. Confronted with a com-
> plex optical situation, the beholder
> searches for the form with the most
> stable unity, or with the least
> disturbed relationship to the environ-
> ment."[35]
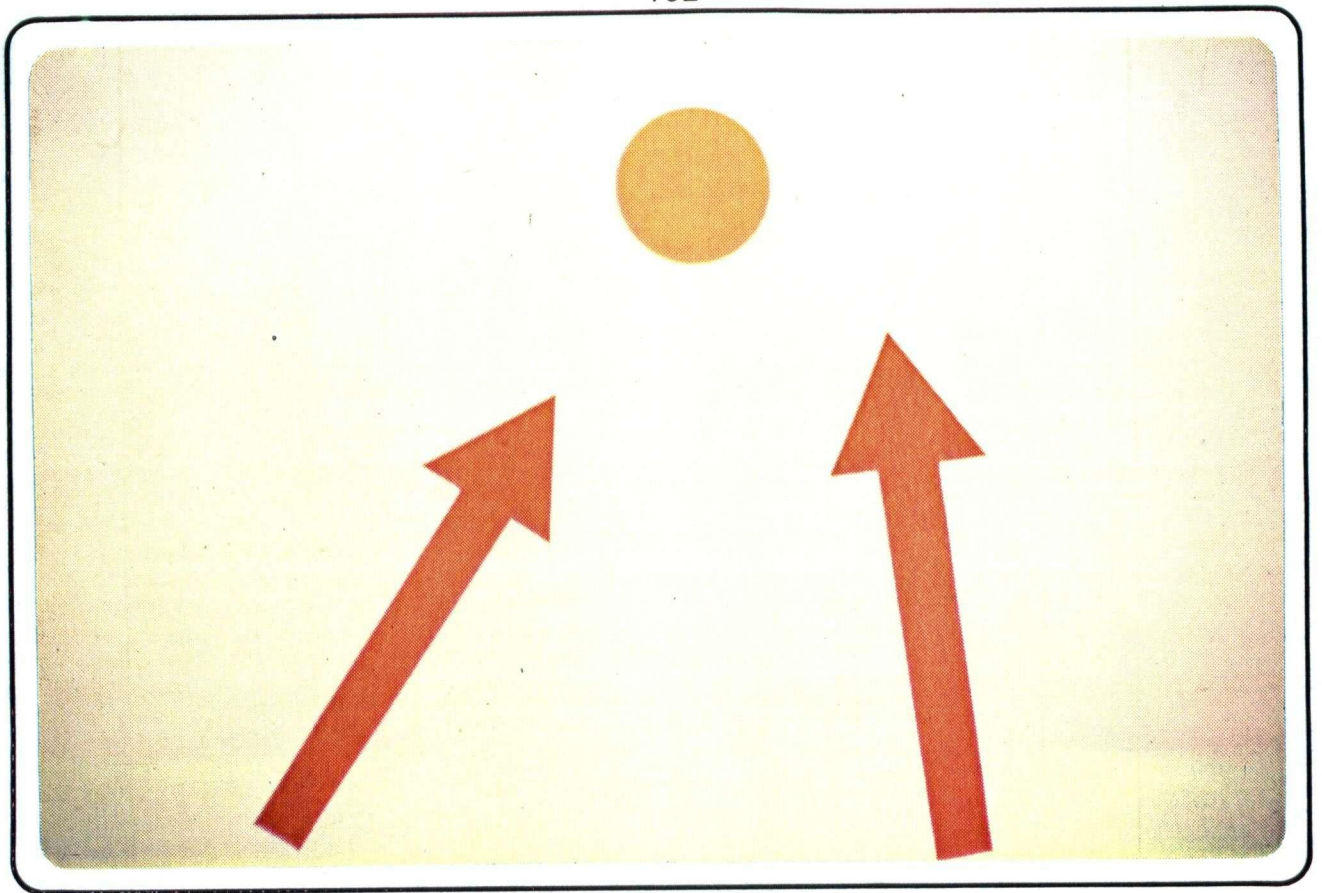
CONTINUATION (I)

The principle of continuation allows one to predict that anyone would agree that the arrow on the left is pointing to the circle. The arrow on the right, however, when continued mentally, misses the circle completely.
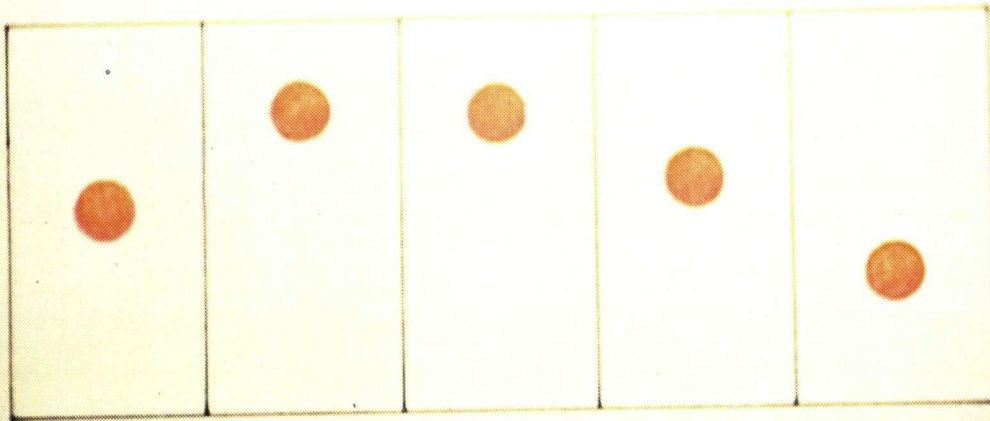
CONTINUATION (II)

The principle of continuation can be used to develop a sense
of movement. In this example, the changing positions of the
circles within the frames is viewed as one circle at various
stages of a continuous motion.
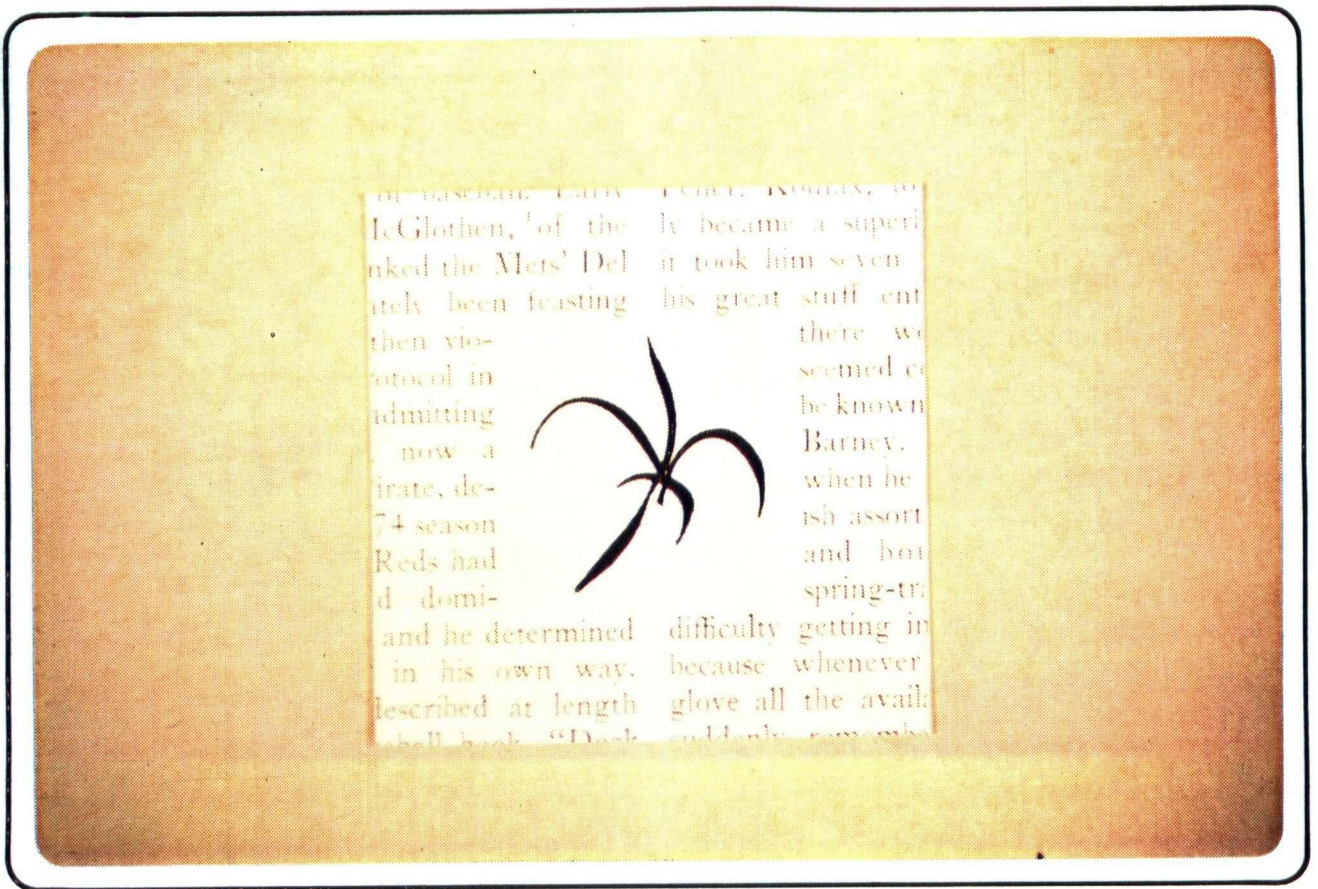
CONTINUATION (III)

Continuation can be used as an organizing principle. If several forms in a graphic image imply similar continuations, they are perceived as belonging together.

The New Yorker. Sept. 13, 1976. p. 93.

If the areas are unclosed, "a psychological filling-out of the intervals between the units occurs, and one constructs the latent connections."[36]

Closure, therefore, is "a property belonging to the whole and not to the parts". It "presupposes interaction between the parts".[37] "If the unit is 'open' or 'incomplete' then that part of the field which corresponds to the gap will be a seat of very particular forces, forces which will make the arousal of processes of closure easier than the arousal of any others. The closure will, of course, be that closure which is demanded by the rest of the figure, a closure of good continuation."[38] Closure is a "dynamic process"[39] which requires the participation of the observer.

Gestalt Theory extrapolates from this perceptual Law of Closure to other types of human experience. Hence, Köhler is quoted as asserting that "The temporal position of one experience as 'between' two others is frequently experienced in the same way that spatial 'betweenness' is."[40] This property of closure is basic to the perceived continuity of motion pictures. Furthermore, the Gestaltists believed that "to achieve closure in everyday activities as well as perception is psychologically and physiologically rewarding."[41]

The factor of equilibrium in a visual field was formulated into a Gestalt principle by Wertheimer who called it the Law of Prägnanz.[42] The German term "prägnanz" is frequently retained in the English translations of Gestalt
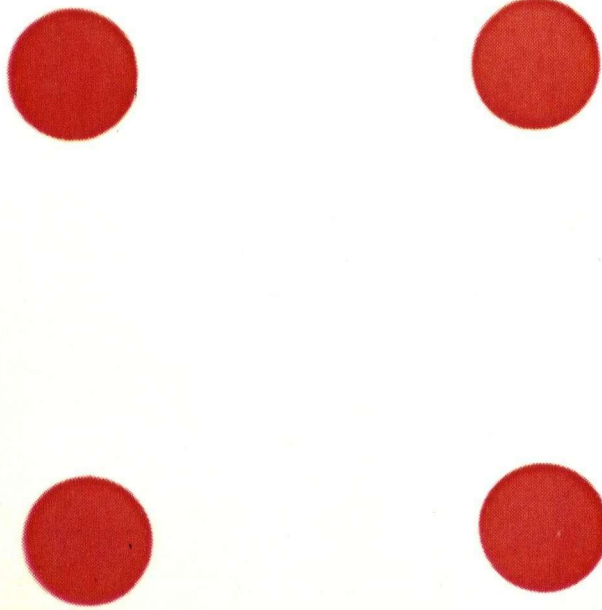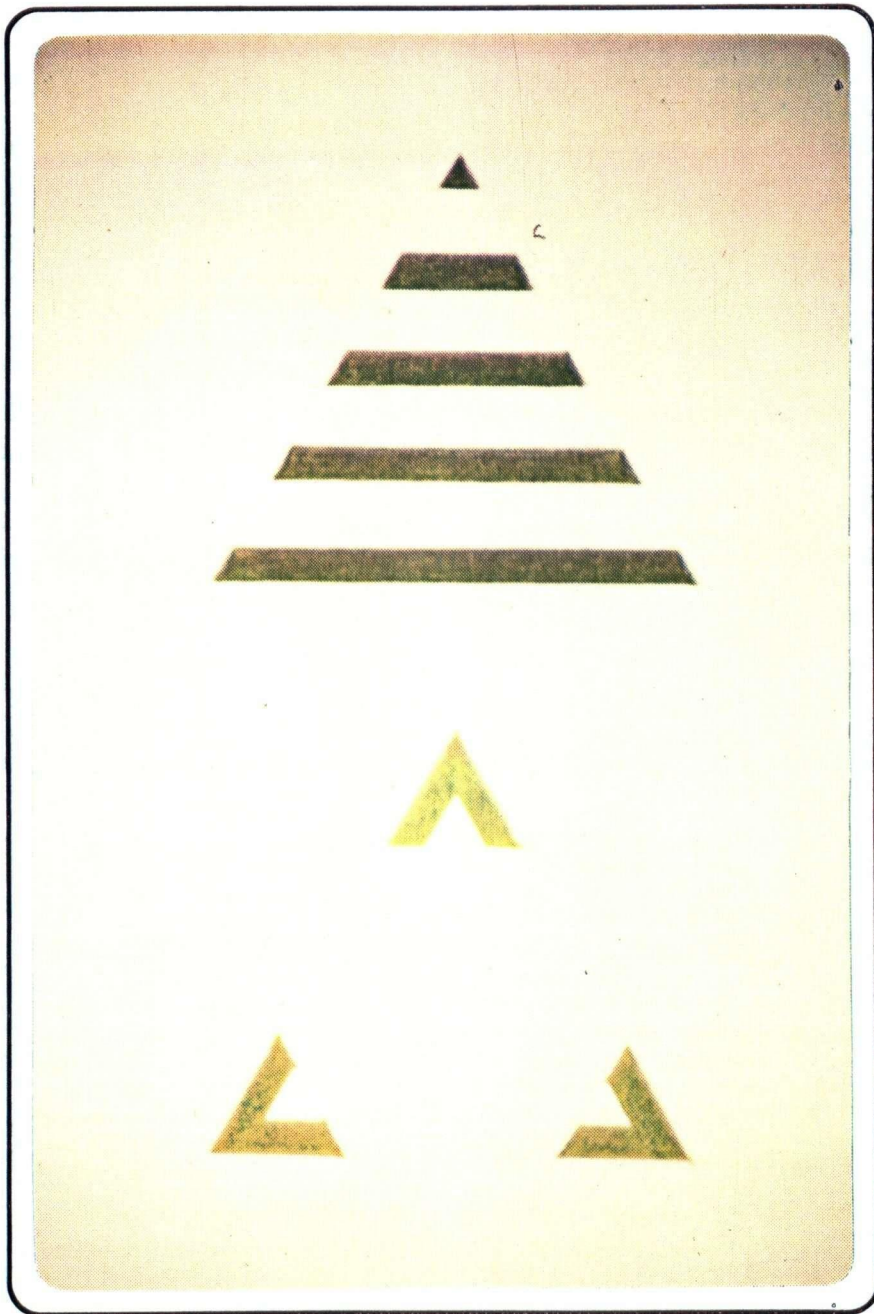
CLOSURE (I)

"Closure implies a strong tendency to close gaps in what
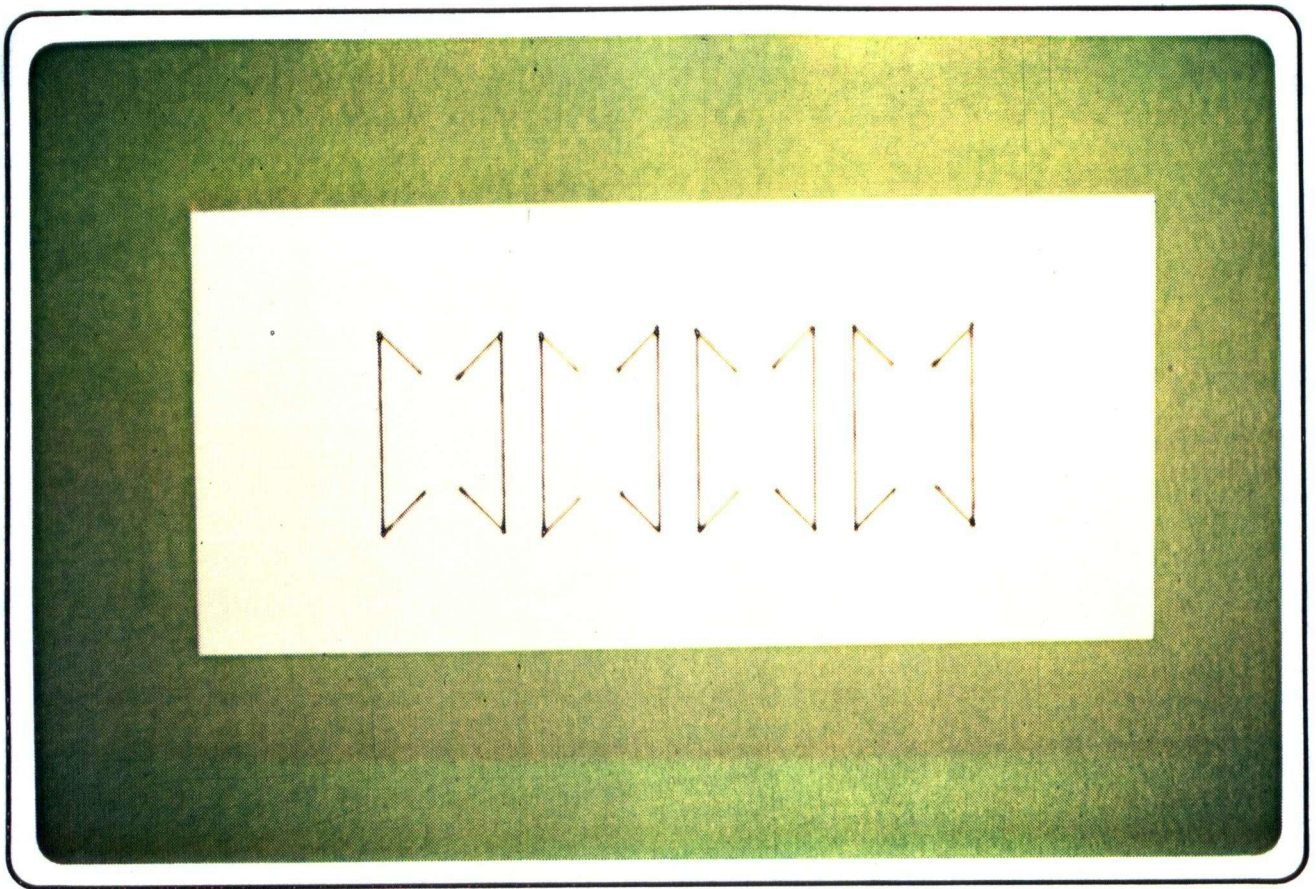is perceived as an incomplete configuration."

John W. Cataldo. Graphic Design and Visual Communication.
International Textbook Co. Scranton, Penn. 1966. p.120.

CLOSURE (II)

"A gradual increase of the elements on (a uniform) surface
shows clearly that....a spatial unity can be maintained."

Gyorgy Kepes. Language of Vision. Paul Theobald. Chicago,
1944. p. 51.

CLOSURE (III)

"Predominantly not those vertical lines which are in closer
proximity form the groups but those which enclose space,
although....their distance is three times as great, as that of
the nearer ones, the distance between the ends of the short
oblique lines being equal to that of the nearer vertical ones."

Kurt Koffka. Principles of Gestalt Psychology. Harcourt, Brace
& World, Inc. New York, 1963. p. 168.
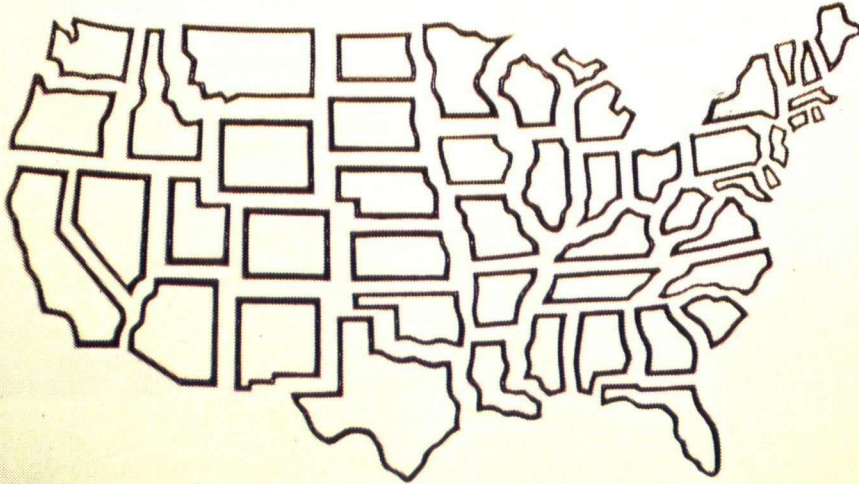
CLOSURE (IV)

An advertisement for Bell Telephone utilizes the principle of closure.

The New Yorker. June 9, 1975. p. 69.

texts since its meaning is felt to include the concepts of "goodness of form" and "simplicity" as well as of "equilibrium". The Law of Prägnanz, briefly formulated, is that "psychological organization will always be as 'good' as the prevailing conditions allow."[43]

The Gestalt theorists developed their concept of prägnanz from their awareness of certain discoveries within the field of physics. Their contemporary physicists "emphasized" that "physical systems....progress toward stationary states."[44] The Gestaltists found many examples in physics of "spontaneously arising equilibrium structures"[45] such as the fact that a loop of thread on a film of soap will immediately become a circle when the film is pricked inside the loop.[46]

> "All physical activity - according to the
> gestaltists - can be defined as striving
> for balance, e.g., the drop of water
> rounds itself into a sphere; the stretched
> film or membrane contracts as nearly as
> possible into a circle; the after-image of
> a sharp square gradually becomes rounded
> into a circular shape; molten metal forms
> into a ball shape."[47]

Hence, the Law of Prägnanz is, for the purposes of visual organization " a law of equilibrium like the principles of the maximum or minimum in physics....When organization moves toward a minimum, it is characterized phenomenally by the simplicity of uniformity; when it moves toward a maximum, it is characterized by the simplicity of perfect articulation."[48] For Koffka, after-image experiments are examples of the simplicity of uniformity whereas good continuation is an example of perfect articulation.[49] Thus Hilgard, "sacrificing a great

deal of the precision of the physical proposition" states that

"in psychological organization either as much or as little will

happen as the prevailing conditions permit."[50]

Proximity, similarity, closure, and continuation are

all factors which can be manipulated to achieve equilibrium

in the optical field. Purposeful organization is the key to

the achievement of a dynamic equilibrium in the picture-plane.

As Kepes explains:

> "A random placing of spatial forces, point, line
> area, will open the picture-plane, but because
> these forces are so haphazardly arranged, they
> will not reach a balanced constellation....The
> picture surface is made hollow; the two-
> dimensional background, the frame of reference
> in which the spatial movements can be measured
> is missing....If the forces and their induced
> fields are of equal optical quality and spatial
> strength, a balance will be reached, but it will
> be without tension, static and lifeless. If,
> however, one knows how to estimate the forces
> and their energy-field, he will be able to use
> such opposing fields so that each will balance
> the other on the picture-plane....These move-
> ments may be different in terms of their optical
> measures and qualities....but, if they are equal
> in strength in terms of their spatial fields, a
> dynamic equilibrium will be reached on the
> picture surface."[51]

Arnheim relates "the concept of equilibrium" to "the principle

of entropy in physics" and to "homeostasis in physiology" as

well as to Gestalt psychology.[52] He feels that this concept

promises to "provide the psychology of art with the foundation

it lacks."[53] For him, "balance" has a "broad organic base"

since it is "assumed to govern the physiological forces or-

ganizing the processes of vision in the brain."[54] Further-

more, he asserts that "the psychology of motivation interprets

Jean Helion. Linoleum Cut 1932

EQUILIBRIUM (I)

Equilibrium is the ultimate goal sought by graphic artists
in their works.

Gyorgy Kepes. Language of Vision. Paul Theobald. Chicago.
1944. p. 40.
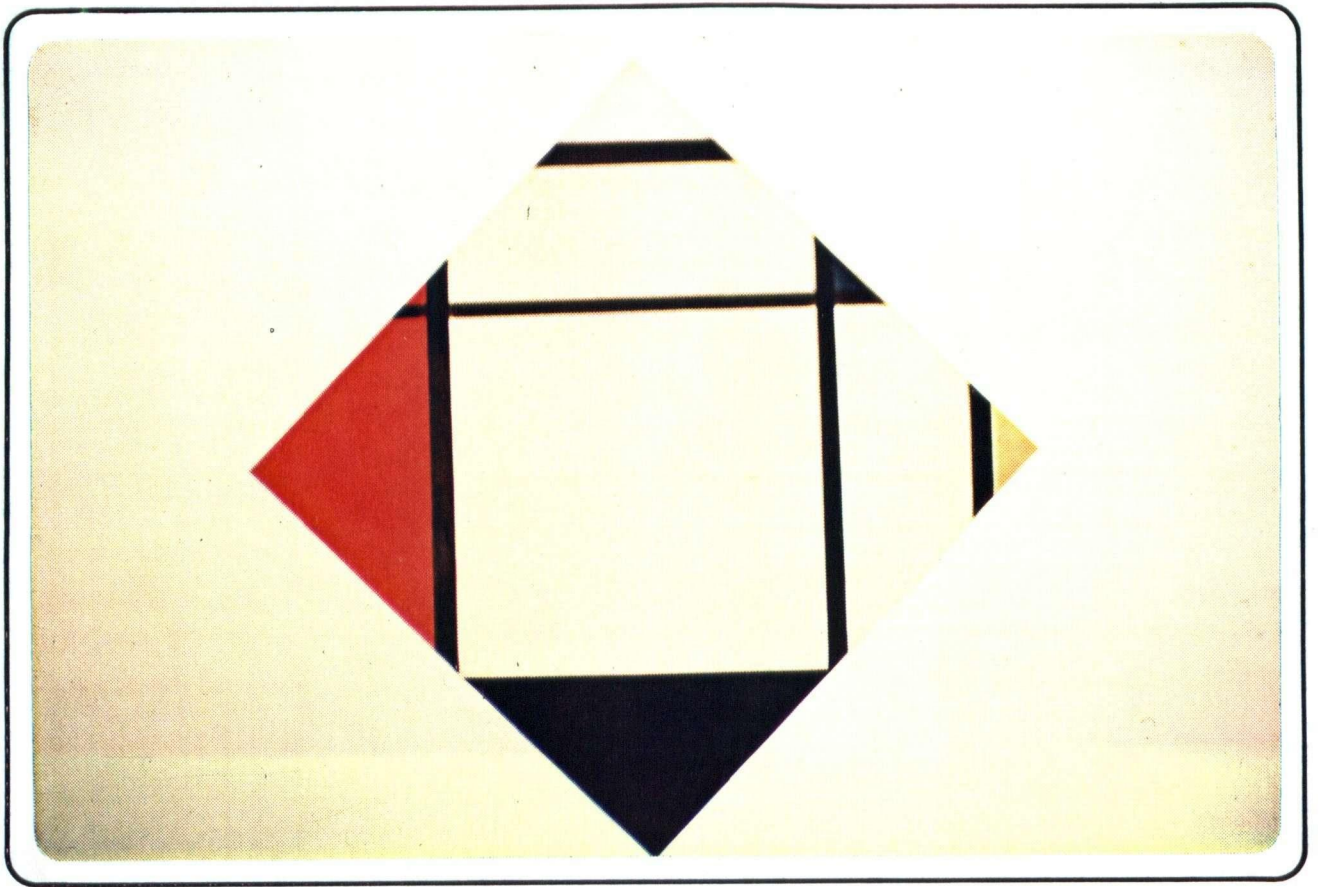
EQUILIBRIUM (II)

Abstract art depends heavily on equilibrium as its principle
of organization. The work of Piet Mondrian is often cited
in this regard.

Hans L.C. Jaffe. Piet Mondrian. Harry N. Abrams, Inc. New
York, 1970. p. 141.

human striving as a need for balance."[55]   Hence, equilibrium

is indeed "an over-all principle."[56]

The basic properties of proximity, similarity, and
equilibrium can be used to create rhythmical organization in
the visual field. The Law of Good Continuation would define
the success of an attempt at structuring a rhythmic optical
sequence, since each repeated form theoretically implies its
own appropriate rhythm. Kepes argues that rhythm in graphics
corresponds to the physical process of seeing:

> "Unbroken activity burns out nervous energies.
> The eye as it works needs both action and
> repose....The orderly repetition or regular
> alteration of optical similarities or
> equalities dictates the rhythm of the plastic
> organization. In recognizing such order one
> learns when the next eye action is due and
> what particular neuromuscular adjustment will
> be necessary to grasp the next unit. To
> conserve the attentive energies of vision,
> therefore, the picture surface must have a
> temporal structure of organization."[57]

> "Rhythmical patterning of the picture surface
> can exist on as many levels as the
> differentiations of the visual field. If a
> surface permits any subdivision that repeats its
> own shape or size in a smaller form, a simple
> geometric order is achieved. This subdivision
> implies sizes, positions, directions and
> intervals. When the orderly measure of the
> optical units is related to their virtual
> movement from and to the picture-plane a higher
> level of rhythm is reached. We have then a
> rhythm of the plastic forces, a regular change
> of sensation of spatial movements of colors
> and values; advancing, receding, expanding,
> contracting, moving up, down, left and right.
> Finally we might have orderly changes or
> repetition of more complex configurations of
> visual experience; rhythmic order of tension
> and repose, concentration and rarification,
> harmony and discord....Rhythms may correspond
> with and amplify each other, or they may
> oppose each other, causing a higher level of
> rhythmic configuration."[58]
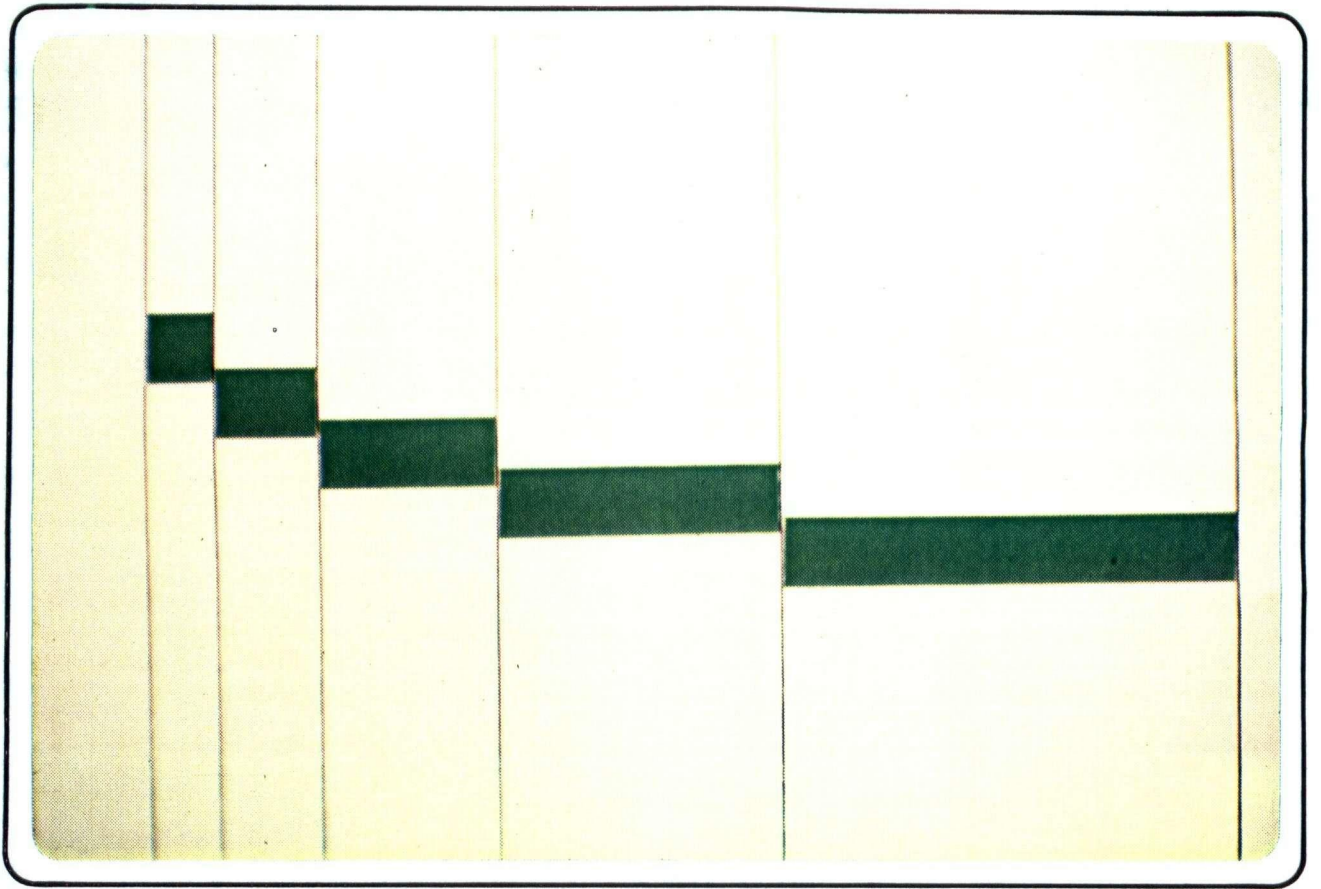
RHYTHM (I)

Forms repeated in appropriate intervals produce a sense
of rhythm in a graphic image.
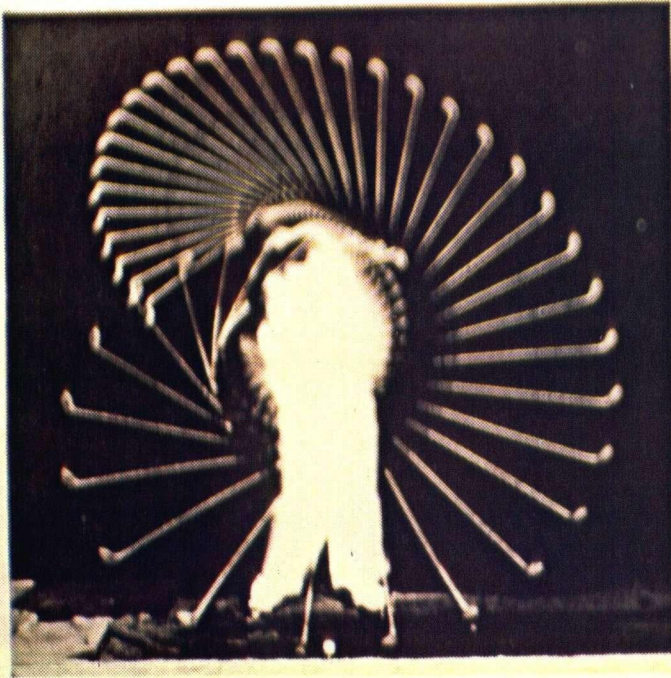
Harold E. Edgerton Golfer

RHYTHM(II)

Rhythmic events can be expressed in a static graphic image.

GYORGY KEPES. Language of Vision. Paul Theobald. Chicago, 1944. p. 182.

The laws of perceptual organization which have been
described here do not provide the graphic artist with formulae
for producing effective designs. Instead, they should be
regarded as criteria for understanding and evaluating graphics.
Hence, they are equally valuable to the planner as to the
graphic artist, since they provide the planning professional
with means to assess planning graphics. In addition, they
reveal that successful graphic images must not only satisfy
the rational, objective functions intended for them; but also
meet aesthetic and visual criteria. As Arnheim states it:

> "Form must not be considered merely in relation
> to the reality of environmental objects, whose
> images it creates; it has a reality of its own,
> a world governed by its own laws, namely, the
> laws of perceptual organization. In pictorial
> representation, the organization of form is
> dominated by the task of creating a structural
> equivalent of the model-object. But, apart
> from its interpretative function, well-
> organized form has a value of its own for the
> organism."59

It may be argued that the aesthetic features of graphic composition,
while desirable, are not indispensable. However, graphics which
ignore the laws which the psychologists have found to be in-
herent to human perception may disturb their viewers. Any such
disturbance would be better avoided if possible. In the case
of equilibrium, for example, Arnheim believes that "in a
balanced composition....the whole assumes the character of
'necessity' in all its parts."60 However, "an unbalanced
composition looks accidental, transitory, and therefore in-
valid."61 Certainly, the planner would prefer graphics which
imply necessity instead of invalidity. Arnheim suggests that
the laws of perceptual organization provide the key to such
visual impacts.

A second subject which has a considerable theoretical background to offer to graphics is the use of colour. Colours can be shown to have emotional and physiological effects which are fairly uniform among different individuals. Hence, the perception of colour is subject to certain psychological laws similar to those described for images. According to Patricia Sloane, there has recently been a "changing role of colour" which "has keynoted a general revolution in human thinking, leading to a greater respect for the visual work, and for the modes and laws of visual perception. Today, colour....is most often used for the direct perceptual sensations it can evoke. Colour is less often used as symbol, and is less often used as imitation."[62]

From a physiological point of view, "The retina, in informing the brain about colour, does not record each of the infinitely many shades and hues....but limits itself to a few fundamental colours, or range of colour, from which all the others are derived."[63] Arnheim therefore concludes that "even physiologically vision imposes a conceptual order on th material records."[64] Specifically, "colour patterns are seen as elaborations of the elementary, pure qualities of yellow, red, blue."[65] Some "combinations are sufficiently precise in themselves to function as visual concepts in their own right, eg. orange, green, or purple."[66] For design purposes, "These secondary concepts serve as transitional links between the primaries."[67]

Colours have a variety of properties which can also be considered as perceptual laws. The example is that of "colour contrast".[68] As Arnheim describes this phenomenon,

> "neighboring colors strive to relate....colors
> will change in the direction of the simplest
> relation their difference offers....the
> partners may change their own appearance for
> the relation's sake....They may relinquish
> their own simplicity in order to increase the
> simplicity of the relation among them. Under
> the pressure towards contrast a pure red ad-
> joining a pure yellow may turn purplish while
> the yellow becomes greenish."69

A second example of colour principle is transparency. An illusion of transparency is created when an area, which is between two other areas of colour, is a shade which is "an approximate mixture of the other two colours."[70] So "the mind restructures the unitary central colour in such a way that a superposition of two colours is seen where one colour would be seen otherwise."[71]

The various properties of colours are important to the work of the graphic designer. For the planner, however, the affective impact of colours is probably of most interest. A particularly convincing work on the subject of the emotional and psychological connotations of colours is the Color Test devised by Dr. Max Lüscher. In the Lüscher test, the individual being tested is asked to state his personal preferences for certain colours over other colours without relating them to any particular use or setting. The complete test requires forty-three selections involving a total of seventy-three "color-patches". An analysis of the results "affords a wealth of information concerning the

conscious and unconscious psychological structure of the individual, areas of psychic stress, the state of glandular balance or imbalance, and much physiological information."[72] From this information about the correlations of certain colours to psychological and physical conditions, the characteristics of specific colours are derived. Hence, red is found to be emotionally exciting as well as to have "a decidedly stimulating effect on the nervous system - blood pressure increases, respiration rate and heartbeat both speed up."[73] On the other hand, "dark blue is.... 'calming' in its effect" with an effect which is the reverse of red: "blood pressure falls, heartbeat and breathing both slow down."[74] Certainly, if colours have clearly proven clinical effects on both the body and the mind, then graphics for planning purposes should employ colours which are appropriate to the effect being sought, as determined by the planning objectives.

Finally, colours become associated with certain things or uses over time, through the continual process of learning. Graphics professionals should respect these associations. However, they often do not. Arnheim discusses this problem as "avoidable difficulties" which "arise frequently in the use of colors."[75] He cites the experimental results of W.H. Nault who investigated the use of colours on maps with children. He found that the children associated changes in hue with differences in "quality" and changes in value (shades of the same colour) with "change in "quantity, amount or intensity."[76] Maps which ignored these properties were "spontaneously misinterpreted."[77]

For example, the children understood light blue as shallow
water and dark blue as deep water, but mistook a reddish-blue
intended to show the deepest water for islands.[78] Arnheim
concludes that "this sort of problem calls for the help of
artists, designers, and psychologists, acquainted with....
perceptual principles."[79]

A third important area of theoretical information for
graphic design is typography. Naturally, an effective graphic
artist will have a wide knowledge of the variety of typeface
styles which are available in various forms from typewriter
elements to press-apply letters to calligraphy. Many of the
perceptual laws already described can be applied to type layout
concepts. The use of typography is complex since it must meet
two major goals simultaneously: to form an aesthetic, balanced
composition and to express the content appropriately and legibly.
The choice of typefaces which are appropriate to the content
necessitates two kinds of knowledge on the part of the person
making the decision: an understanding of the content itself
and its purpose, and a knowledge of the impact of different type-
faces. So, for example, an old-fashioned typeface like Old
English would be appropriate for a report on the Tudor style
houses of Vancouver but not perhaps for a study of projected
transit demands.

The choice of a legible typeface is equally important,
especially in the case of a long text. Cataldo presents a
concise summary of the major factors in legibility:

>"Legibility is determined in large part by the
>space (leading) above and below lines of copy
>....more space between the lines improves
>legibility. Generally, leading from 2 points
>to 4 points will resolve most legibility
>problems....Additional leading beyond 4 points
>with an 8 point or 10 point body text may increase
>the ground (or white space) so much, however that
>the continuity of the text is interrupted, and
>legibility is lost. Mechanical factors such as
>line width, leading, and body text determine
>ease of legibility."[80]

With respect to body text, psychological tests have demonstrated

a number of useful principles, many of which confirm existing

practices. For example, "italics....strain and disturb, for

this reason they are recommended wherever there is need for

emphasis."[81] And the use of all capital letters will "retard

the speed of reading to a striking degree: 12 percent."[82] If

the graphic artist and planner are aware of the properties of

typography, they can use such principles to ease the strain on

the reader, to highlight important points, and to vary reading

tempo for interest.

The value of symbols for graphic work has already been

discussed in the previous chapter particularly in reference to

the theories of Boulding, Arnheim and Gombrich. Symbolism is

mentioned again in the context of the theoretical basis for

graphic techniques for several reasons. For one thing, specific

symbols carry distinct messages with both rational and emotional

connotations. These meanings are taught to the members of

society through the things in their environment and are, there-

fore, generally shared, public images. The graphic designer

must use symbols with respect for the values associated with

them. An attempt to alter or take symbols out of context leads to misunderstanding. Secondly, in the limited literature dealing with graphics which has been produced by members of the planning profession, a large portion of the effort has been directed at graphic symbols for iconic signs for such uses as traffic control and direction; and commercial, industrial, and institutional identification.[83] The symbols developed for these purposes are usually tested for effectiveness before use. They, therefore, represent a source of information about the appropriateness and comprehensibility of images. They also suggest a wide range of possible applications in other graphic situations and media than signs.

The last area of graphic technique to be discussed is the choice of media for graphic expression. As with spatial organization, colours, typography, and symbols, the medium chosen must be appropriate to both the subject matter and the psychological and educational characteristics of the audience. In addition, since the range and variety of graphic media, as discussed in the Introduction, is so large, two further constraints must also be considered: the areas of available expertise of graphic designers and the budgets of both time and money which are allotted to the task. For example, it is pointless to decide to use a film for a particular project if nobody on the graphics staff has film experience and there is no budget to hire a consultant, even if a movie seems the most appropriate medium.

The interviews with local planning professionals
revealed considerable disagreement regarding the effectiveness
of various media. None of the people interviewed had even
undertaken a structured evaluation of the value of the graphic
media they use on a regular basis. Unfortunately, there is little
academic literature which confirms or contradicts their opinions.
The experimental work that has been done is detailed, specific,
and, therefore, hard to generalize. Naturally, it is extremely
difficult to design controlled studies of graphic techniques
and their impacts since graphic images are complex, with many
factors operating at once. Perhaps, for this reason, the
opinions of graphic practioners are particularly valuable. As
Arnheim expresses it: "for every sort of visual presentation
in textbooks, models, charts, films....careful investigation
of what the person sees for whom these images are made are
indispensable."[84] He further feels that this information will
come from those "acquainted" with both "the theoretical and
practical handling of perceptual principles."[85]

In summary, then, it seems that there are several
theoretical aspects of graphic technique which offer valuable
information to the planner or graphic artist for improving the
ability of planning graphics both to express planning objectives
and to communicate to an audience. These areas are perceptual
theory based on gestalt psychology, colour theory, typography,
the derivation of symbols, and the choice of appropriate media.
The following section presents the conclusions reached when this
specific theoretical material, the "grammar" of graphics, and

the general theory of visual "language" from Chapter 3 is
considered in the light of the interviews held.

CHAPTER 4: FOOTNOTES

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3 Ibid. p. 9.

4 John W. Cataldo. _Graphic Design: Visual Communication_.
   International Textbook Co. Scranton, Penn., 1966. p. 4.

5 Ibid. p. 13.

6 Ibid. p. 4.

7 Ibid. p. 4.

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9 Ibid. p. 234.

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11 Arnheim, _Toward A Psychology of Art_, op. cit., p. 22.

12 Max Wertheimer. "Laws of Organization in Perceptual Forms".
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17 Koffka, op. cit., p. 315.

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25 Kepes, Language of Vision. op. cit., p. 47.

26 Koffka, op. cit., p. 153.

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28 Ibid. p. 49.

29 Cataldo, op. cit., p. 119.

30 Koffka, op. cit., p. 175.

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35 Kepes, Language of Vision. op. cit., p. 51.

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42 Koffka, op. cit., p. 110.

43 Ibid. p. 110.

44 Wolfgang Köhler. "Physical Gestalten" in Ellis (ed.), op. cit.
    p. 54.

45 Kohler. "Some Gestalt Principles". in Ellis (ed.), op. cit.
    p. 64.

46 Kohler. "Physical Gestalten". op. cit., p. 54.

47 Cataldo, op. cit., p. 118.

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49 Koffka, op. cit., p. 171.

50 Cataldo. op. cit., p. 118.

51 Kepes, Language of Vision. op. cit., p. 36.

52 Arnheim. Toward a Psychology of Art. op. cit., p. 21.

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55 Ibid. p. 103.

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61 Ibid. p. 76.

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CONCLUSIONS

Conclusions regarding the role of graphics in the planning process are suggested both by the information obtained from the interviews with local planners and graphic artists and by the literature on graphic theory and technique. The questions asked in the interviews were designed to reveal specific current practices as well as individual attitudes and opinions on these practices. Various question topics relate to subjects treated in the review of the literature. Hence, the format used in the interviews seems appropriate for discussing the conclusions which result from comparing and contrasting present practice with theoretical concepts.

The planning professionals were asked to describe the graphic methods which they use on a regular basis. These methods have been categorized for discussion purposes into two groups: informal graphics used by an individual or within a planning organization and formal graphics for communication of planning ideas to clients or the public. Naturally, this represents an oversimplification. In reality, graphic methods should be envisioned as completing a spectrum which ranges from contemplative doodles at one end to polished multimedia productions at the other end. Nevertheless, by using two basic categories, it became clear that planning professionals generally tend to use rough, quickly executed, shorthand graphics for their own purposes and for explaining concepts to colleagues and more structured, carefully prepared graphics with people outside the profession. To an extent, this tendency is logical since planners usually share attitudes and knowledge among

themselves to a greater degree than with clients or the public.
Kenneth Boulding's theory deals with the importance of shared
beliefs or "images" to successful communication. Society,
Boulding believes, shares a public image. The public image
represents the area of overlap of the individual images of all
the members of that society. To the extent that planners work
to achieve the goals of society, they must work to understand
this public image since it best reflects the needs and as-
pirations of society. Naturally, individual images never
overlap completely. People disagree constantly because they
have significantly different images of the world. These
differences can be thought of as arising for two reasons. In
many cases, people disagree bacause they do not all derive their
images from the same information. Planners can help to resolve
such differences by providing additional information to the
public or by facilitating an exchange of ideas among individuals.
Graphics are a useful tool for these purposes. In other cases,
people differ because their opinions reflect opposing values.
Planners can work to demonstrate to individuals the implications
of the values they hold on planning decisions. People may
alter their images when given information about the logical
consequences of their beliefs. However, the final resolution
of value differences must occur in the political arena.

Planners are a part of the political process which
Boulding describes as constantly changing the public image
through communication and feedback of new ideas. Planning
concepts are usually first shared by the planning profession

before they become integrated into the general public image.
Graphic images can be considered as one of the tools used by
planners to communicate these changing concepts to society.
And Rudolf Arnheim has pointed out that graphic images which
are simplified through abstraction are only successful if they
represent a concept shared by the group with whom they are used.
Hence, simple, abstract images, especially those using symbols
or signs, are probably best suited for planners to communicate
with other planners unless these symbols or signs are part of
society's public imagery. Therefore, graphic images must be
sufficiently explanatory or pictorial for the audience which
is to be reached by them. Since images can function at various
levels of abstraction appropriate for certain audiences and in-
appropriate for others, it is essential that the person
responsible for choosing a graphic image understand the nature
of its intended audience. In this way the image can be designed
at a suitable level of abstraction.

Arnheim further suggests that content should influence
graphic design. The message and the context cannot be
dissociated. For planning purposes, this implies that the
subject matter should influence the choices of medium and
technique. As Gombrich indicates, the person making such
choices should, therefore, understand enough about the planning
concepts and objectives behind the required graphic design to
be sensitive to what elements of the graphic content are im-
portant and must be emphasized and to what other features can
be downplayed or even eliminated without jeopardizing the overall

impact. It is virtually impossible for a graphic artist to exercise such selectivity without understanding the planning objectives.

Gombrich also discusses the importance of the image and the word providing mutual support to successfully communicate an idea. When graphics are used to complement a text, as was seen to be the most common use among those interviewed, the graphics professional should have a knowledge of the content and meaning of that text. Nevertheless, a number of interviews revealed that graphics were prepared to illustrate written material by artists who had not even read the content. To the extent that graphic images of all types, from pictures to diagrams to symbols, support and complement written planning material, a greater variety and number of people can understand what is being communicated. People with inadequate verbal skills have an opportunity to supplement their reading by referring to the graphics. Visually oriented people are likely to use report graphics to assess content. In these cases, it is essential that the graphics represent an accurate reflection of the planning information. Graphics, since they are well suited to expressing complex inter-relationships among a diversity of factors, are especially useful in aiding readers to visualize project methodology or to summarize the resultant recommendations.

Decisions such as the choice of a level of abstraction or of an appropriate technique to express the specific planning content are important to the production of effective graphics.

Good graphics are desirable, however, not only because they promote communication of planning concepts to others. Rudolf Arnheim believes that visual images are the key to any cognitive process and especially to problem solving. Graphics can be thought of as a method for expressing mental visual images in a concrete form. Images are useful in problem solving because they have the ability to summarize and represent complex ideas in a compact form. As Marshall McLuhan explains, words are unsuitable for thinking about complexity due to their linear nature. Since planners must constantly work to solve complex problems involving the simultaneous interaction of many factors, visual thinking is an important ability to acquire and use. John Adams suggests that visual thinking is not the only available problem solving strategy. However, he does explain convincingly that visual images must be used to resolve certain types of problems. He discusses how the graphic expressions of such visual images can be utilized both to communicate ideas to others and to think about problems oneself. In the light of these theories, it seems extremely superficial to think that planners need not take an active interest in the use of graphics within their profession.

The planners and graphic artists interviewed mentioned a wide variety of specific graphic methods. They also discussed the situations and audiences to which they felt their methods were suited. In some cases, the graphic methods which planners used as thinking aids or research tools were the sources for more structured graphics for presentation purposes. At other

times, graphics were prepared after the planning process was
completed to communicate the final concepts to a certain
audience or to a range of audiences. There was no consensus
of opinion emerging from the interviews regarding the
appropriateness of specific methods for particular audiences.
However, from a theoretical point of view, it can probably be
safely stated that graphics which proved useful during the
stages of the actual planning process, since they are developed
by the planners involved in that process, provide a logically
good source for presentation material. If these images aided
the planners to think about the complex factors with which they
were working, they would probably help to communicate to others
once put into a more complete and structured form. However,
no conclusions can be made from the available information on
the relative effectiveness of images devised especially for
communication to external groups. In contrast, as has been
noted previously, the planners interviewed concurred to a
surprising extent on the subject of graphic presentations to
politicians: most felt reluctant to use images before political
bodies. Perhaps this reluctance reveals an underlying distrust
of politicians by planners or an effort by planners to manipulate
politicians by providing only partial information. However, if
the theories regarding the value of visual imagery for under-
standing and communication seem valid and if planners do want
to communicate their recommendations to the decision makers,
then ways must be found to develop appropriate graphic forms
for use before politicians. This can best be accomplished

through a process of mutual training. Planners must experiment with a variety of graphic methods to convey useful visual images to politicians. At the same time, the politicians could provide planners with feedback on the value of various images to them. It seems evident that the development of such appropriate methods would benefit both groups.

The second major topic area covered in the interviews concerned the communication of the objectives for planning graphics between planners and the graphic artists charged with producing those graphics. It was found that there are a wide variety of approaches in use. One aspect which varies considerably is the stage of the planning process during which a graphic specialist is first included. On one hand, graphic artists were brought in at the beginning and treated as a member of the planning team. However, this approach, although preferred by a number of people, was relatively rare. On the other hand, graphic artists were sometimes brought into the process at the end to develop presentation-quality images. Another variable is the value given by the planners to the expertise of the graphic specialists with whom they work. This variable is interconnected with another: the levels of graphic skill possessed by the planners themselves. It was seen that, in some instances, the graphic artists are treated as technicians who prepare images according to detailed instructions. This type of approach requires that the planners know enough about their graphic requirements and how to achieve them to give the necessary instructions to the graphic specialists who must

produce them. In other circumstances, the graphic artists are consulted for their advice regarding graphic requirements and appropriate graphic methods. Or the graphic specialists may be given the initiative to develop the graphics from an explanation of the planners' objectives. The planners who do not have an adequate knowledge of graphics have no choice but to rely on graphic artists to prepare their graphics. Unfortunately, if planners do not feel confident of the abilities of the graphic designers with whom they work to understand their objectives and to produce appropriate images, they may choose not to employ graphics if they can be avoided. Clearly, it is undesirable to lose the value graphic images offer for communicating planning concepts due to a breakdown in the communications between practicing planners and graphic artists.

There are a number of steps which can be recommended to reduce the possibility of a breakdown in communication between planners and graphic artists. For one thing, it is preferable to have the graphic artists introduced to the planning process at an early stage. In this way, they will learn about the planning objectives as the project progresses. The graphics specialists will then have the necessary knowledge either to provide the planners with good, informed advice or to take the initiative to produce appropriate visual images. If knowledgeable graphic designers are desirable, it also follows that the more the graphics people know about the planning field as it relates to particular projects the better will be their input and products. Planners should understand the uses and limitations

of graphics as well. Those planners who are capable of pro-
ducing graphics themselves are best equipped to discuss graphics
with artists. However, it suffices that planners appreciate
graphics' potentials and are willing to explain their goals to
graphic designers.

Attitudes toward the role of graphics in planning
become institutionalized in the way planning departments and
organizations set up their graphics staff. Some planning
groups have separate graphics sections. This tends to encourage
planners to finish their projects and then to send them out to
another place to have graphics prepared for them. Such a
structure makes it difficult to have a graphic artist serve as
a member of a planning team for a specific project from its
initiation. Other planning organizations had their graphic
specialists integrated into the planning staff. This system
tends to encourage planners to consult with artists throughout
a project. It also permits the graphics staff members to watch
the progress of projects with which they are involved since
they are not separated spatially from the planning activities
It seems prefereable, therefore to establish the structure of
a planning organization to permit the planners and the graphic
artists to have ongoing access to one another.

Thirdly, all the people interviewed were asked to
estimate how much time and budget were devoted to graphics
either in their particular job or in their planning organization.
Since estimates ranged as high as 25% of total staff time or of
project budgets, it seems that graphics are far too costly to

be neglected by planning theory as has been the case. If
planning organizations are devoting up to one fourth of their
resources to using graphics in all the forms and functions
which were mentioned in the interviews, it would be useful for
them to evaluate their regular practives to determine the
relative effectiveness of current methods. However, as has
been noted, none of the people interviewed had been involved
in a systematic attempt to evaluate graphics. Since the
potential savings from eliminating ineffective graphic practices
are large according to these estimates, it seems justifiable
to invest some staff time and budget to evaluation of specific
methods. Unless attempts are made to assess the usefulness of
various widely used methods, there will be no concrete basis
upon which conclusions about the impact of different methods
on different audiences. The interviews demonstrated that both
planners and graphic professionals hold many conflicting opinions
regarding the relative merits of various graphic methods.
People receiving printed graphic material or attending present-
ations with graphic aspects could be surveyed with questionnaires.
Even a brief questionnaire could yield useful results which
might suggest improvements in the type of graphics subjected to
the evaluation. Data should be collected on the suitability
of specific graphic forms to different audiences, on the best
graphic forms to express various categories of planning concepts,
and on the relative improvements provided by the more expensive
graphic methods with respect to additional costs.

Finally, everyone was asked in the interviews to describe his or her studies of both planning and graphics and to specify which has proved valuable in practice. These considerations led to recommendations regarding worthwhile studies for students intending to enter the planning profession. Few people felt that graphic artists working for planners should study planning theory. Both the planners and the graphic artists concentrated on discussing graphic methods as skills which can be better acquired through practical experience than through formal studies. And most of the recommended studies revolved around specific skills as well. Only a minority of the graphic artists had studied any of the theoretical literature on perceptual psychology, colour, typography, or symbols. While these artists had generally found these studies interesting, they did not recommend them to planners. Nobody knew of any academic research which was applicable to the choice of appropriate media for specific purposes or audiences.

It can be concluded from talking with the local planners and graphics professionals associated with planning organizations that the overriding concern in graphic presentation for planning purposes is the acquisition of specific technical skills involving the use of various media. Little value is usually placed on theoretical considerations. This pattern is interrelated with another issue: to what extent the ability to produce effective graphics is related to skills which can be taught and learned as opposed to artistic talent which may or may not be present in the individual. A number of the

theorists who make a case for the usefulness of visual language, especially Arnheim and Adams, were seen to believe that visual awareness can be acquired through training and practice. In fact, they generally feel that, by neglecting such visual learning, people limit their abilities as problem solvers. In the discussions of available theories which treat elements of the visual language or its grammar, it became evident that it is possible to discover graphic principles which can be shown through experiments to be applicable to everyone. The perceptual concepts from the field of psychology were termed laws since they operate in similar fashion with anyone. Because it was possible to find such objective theoretical graphic properties in the literature, it seems clear that graphics can be studied with regard to theory, at least partially. Hence, even planners who do not feel they possess the artistic talents to prepare graphics themselves can benefit from a study of how objective graphic properties affect the value of graphics prepared for them in their profession.

In current practice, graphic artists rely heavily on their aesthetic judgement to evaluate their graphic products. Many of the planners complained that the graphics professionals with whom they work put too much emphasis on aesthetic considerations and too little on content. Graphic artists, however, tend to distrust theory when it comes to graphic production. Arnheim discusses this tension between intellectual and aesthetic criteria in a historical perspective:

> "The fear that formulae might interfere with the freedom of the eye did not come up as long as

> the eye was strong. Only when there was
> suspicion that calculation, instead of
> the eye, was being used for tasks that
> required constant and final visual
> control, did intellect and intuition come
> to be viewed as antagonists."1

Clearly, good graphics will always require intuitive, aesthetic

judgement. This fact cannot, however, be an excuse for planners

to assign all responsibility for graphics to artists. Planners

can, at least, learn how graphics affect their viewers and then

use this knowledge to evaluate graphics prepared by others in

the light of their planning objectives. Consequently, planners

should learn about available graphic theories which suggest

criteria for the evaluation of graphics. Naturally, planners

will also be benefited by training in visual language as a

problem solving and communications method. The ability to use

visual language as a thinking and explanantory strategy will

be enhanced by any practical graphic skills which a planner

acquires. Furthermore, knowledge about practical skills will

give planners an improved perspective on the values and limit-

ations of those methods as well as increasing their ability

to communicate effectively with graphic artists, to achieve

a finished product which is both aesthetic and optimally

effective for planning purposes. It has been seen that graphics

communicate complex messages. As Gerbner pointed out, although

many aspects of a graphic message are usually unconsidered,

through understanding graphic principles more elements in a

graphic image can be controlled to achieve a purposeful impact

on the intended audience.

CONCLUSIONS: FOOTNOTES

1 Rudolf Arnheim in Gyoryg Kepes (ed.) Module, Proportion,
   Symmetry, Rhythm. George Braziller. New York, 1966. p. 224.

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APPENDIX

INTERVIEWS

Planning Professionals

Larry Beasley

Riley Park N.I.P. Area Planner for the
City of Vancouver

Ted Droettboom

Director of the Overall Planning Division,
Vancouver Planning Department

Stan King

William Graham and Associates, Planning
Consultants

Dougald McDonald

Edwin, Reid and Associates, Consultant

Jim Moodie

Co-ordinator of the Champlain Heights
Development for the City of Vancouver

Andreas Naumann

Project Co-ordinator, Ian Hayward and
Associates, Consulting Engineers

Ted Rashleigh

Public Relations, Department of Continuing
Education, University of British Columbia

Len Tennant

Planner, Overall Division, Vancouver
Planning Department

Graphic Specialists

Philip Aldridge

Partner, Topographics Ltd.

Dennis Bedgeley

Graphic Artist, Burnaby Planning Department

Keith Bennett

Supervisor of the Graphics Section,
Vancouver Planning Department

Gordon Cleasby

(telephone conversation)
Graphics supervisor, Greater Vancouver
Regional District, Planning Department

Bud Elsie

Public Relations Consultant

Janet Lee

Graphic Consultant

Simon Scott

Graphics specialist, Arthur Erickson
Architects